2022-24 Producer identified RD&A priorities

Council: **NABRC**

Program area	Priority Rank	Committee origin	New or ongoing priority?	Outcome sought	To adequately achieve the outcome, identify R&D and/or adoption gaps or strategies? • ***For R&D, clearly identify the research gap.*** • ***For adoption, detail a possible strategy that producers would engage with to achieve the intended outcome.***
CN30	1	SQ NWQ CQ SEQ ASPIAC WQ KPIAC BRAC NQ	See R&D gaps coded as **N** or **O**	**Livestock producers are recognized as natural capital stewards through proven, practical, cost-effective methods for measuring and verifying environmental services including carbon sequestration, reductions in GHG emissions, and biodiversity conservation.** Producers need: • certainty and clarity about what the industry needs to do to achieve carbon neutrality and to take advantage of carbon farming opportunities. • clearly defined pathways and standards for measuring carbon accounting and consequences of various outcomes. • practical templates that facilitate understanding and allows them to meet their obligations and industry expectations.	**R&D gaps** <u>Carbon</u> • Clearly defined carbon accounting and measuring standards. **N/O** • Cost-effective, certifiable, region appropriate methodology for measuring soil and plant-based carbon and soil health in extensive grazing systems, and changes over time. **N** • Soil carbon baselines and annual variability on major land types. **N** • Long term carbon sequestration responses to key grazing and pasture management strategies on major land types (especially the link between ground cover, soil type and C status), as an input to models of soil carbon dynamics under different grazing systems. **N/O** <u>Greenhouse Gas</u> • Quantifying what livestock emit on major land/pasture types. **N** • Livestock efficiency and methane emission responses to key grazing and pasture management strategies for beef grazing herds in major regions. **N/O** (*Note: Substandard herd records make it difficult to estimate herd emissions for many businesses.*) • Demonstration of the importance of herd restructuring, culling of non-performing cattle and increasing per head productivity to reduce methane/kg meat. **N** • Identification of regional native browse shrubs containing plant bio-actives for reducing methane emissions, and measuring palatability, diet selection and methane reduction effectiveness in grazing ruminants. Identify and evaluate

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				• tools to make informed decisions about the benefits/costs and risks of carbon farming and other sustainability practices being offered by private enterprises. **This will support:** Pathways to and decisions about: • On-farm carbon neutrality while improving productivity. • Market opportunities and risks (independent advice). • Recognition and rewards for good stewardship already being practiced. • Market access. • Progress towards national and international goals to reduce CO2 in the atmosphere. **Aligns with MLA Programs:** • Environmental sustainability (on-farm) • Market access • Producer adoption	native browse plants (e.g. *Eremophila species*, *Jasminum didymium* and *Lotus australis*) containing plant bio-actives for methane reduction, livestock nutrition, carbon sequestration and biodiversity. **N** • Genetic variability in methane emissions, and identifying the heritability of the traits. **N** (Note: A slow option.) • Supplements, microbiome boluses, inoculations and/or additives to enhance rumen function and target pre-methane factors. **N/O** • Delivery of methane reducing bio-active compounds to extensively grazing cattle (via water, molasses, dry licks, lick blocks, feed rations, etc). **N/O** **Adoption gaps** • Carbon footprint analysis of businesses to assess their current net carbon balance (negative, neutral or positive) and identify where effort is needed /opportunities are to improve C performance, herd performance and land management. • Basic, practical, unbiased advice on the benefits, costs, challenges and risks of carbon neutrality or farming from independent parties regarding carbon farming and other sustainability schemes now available to producers. • Practical templates for producers to record, understand and meet their obligations and industry's expectations. • Building Carbon into existing extension programs. • Region-specific, effective strategies for reducing and/or offsetting emissions and increasing on-farm biodiversity, whilst maintaining a profitable grazing business. • Planting tropical forages shown to reduce rumen methane production (i.e. *Desmanthus, Heteropogon, Leucaena*). • Verifiable unbiassed advice on increasing biological capital in regions/ major land types where C farming has relevance. Overview of short and long-term benefits/rewards and costs in beef enterprises. • Managing landscapes to balance C sequestration through woody thickening and biodiversity loss.

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					• Financial and carbon balance outcomes of key grazing and pasture management strategies in different regions and climates. • Review, verify and promote effective biodiversity planning tools (e.g. LOOC-B) and stewardship programs (e.g. E-Care). • Producer knowledge on how to increase biodiversity and what opportunities there will be to trade biodiversity credits into the future, separate from carbon. **Possible adoption strategies** • Identifying, training and mentoring 'regional C champions'. • Encouraging carbon footprint analysis/baseline at a business level to determine if the farm is net emitting or sequestering GHG. • Use the carbon market to incentivise the maintenance of good land condition and improve poor land condition. • Demonstrations of Carbon accounting methods and properties/ businesses going through carbon measurement process and being certified as carbon neutral. • Promoting groups that become certified carbon neutral. • Using on-farm scenario analyses to demonstrate herd, financial and methane emission outcomes of key grazing and pasture management strategies in different regions and climates. • Information packages for producers describing the options, 'rules', risks and trade-offs, likely economics. • Guide and mentor producers who are willing to be involved, but need to be shown steps how to adjust their businesses to incorporate these new practices, and the financial and social benefits. A series of online and face to face workshops and field days could be delivered by NRMs, Ag Departments or SFOs, etc. • Suitable region and land type specific options for each region/area of potential carbon farming and the costs/benefits. (Note: Could influence people buying properties in different regions.)

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					• Each NABRC region identifies (1-3?) willing producers to be a case study/demo farm, baselined for C and biodiversity for regular field days (6 monthly), reporting progress and looking at decision making along the way. Podcasts interviewing these producers. • Leverage off current proven accredited systems, Innovation Hub activities and resources.
Beef	2	NABRC CQ NWQ BRAC Kimberley KPIAC	See R&D gaps coded as **N** or **O**	**Decision support tools to enable better management and forward planning for economic, environmental and social outcomes. Technology and tools that can be integrated with animal performance data for rapid broadscale and remote assessment of the feedbase, grazing preferences and rangeland condition, and integrating this with animal performance for strategic management decisions.** Producers need: • Ways to accurately measure and manage ground cover and available feed quantity and quality to avoid overgrazing and achieve their production and profitability potential. **This will support:** • Proactive and more timely decision-making and data-based adaptive management of the farming system.	**R&D gaps** • Refinement of new tools (e.g. Cibo Labs) for rapid remote sensing (i.e. measuring & monitoring) of the quality, quantity and composition of pastures, and understorey shrubs in woodland and open forest country. **N/O** • Updated prediction equations for applications of NIR and faecal NIR in accurate assessments of diet quality. **N/O** • Efficient and effective integration of climate/pasture/animal movements/ land condition data sets in decision support tools to predict and forecast the condition and risks to grazing systems and livestock production. **N** • Understanding the motivations of people who overstock and strategies to reduce the occurrence of this behaviour. **N** • Identification of forage quality and quantity in different seasons (green vs dry) to match plant species to stage of life to feed quality (protein and energy levels). **N/O** **Adoption gaps** *Note: This priority will require widespread uptake of objective measuring of animal performance.* • Application of tools for remote forage assessment and budgeting, and managing fire risks. • Economic analysis of benefits of using grazing management tools and improved land management.

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				• Managing fire risks. **Aligns with MLA Programs:** • Productivity (on-farm) - Beef • Capability building • Environmental sustainability (on-farm) • Grazing land management • Producer adoption.	• Compare and identify the advantages and disadvantages of the technology – Cibo Labs, AgriWeb, Mobble, Maia, etc - that offer satellite imagery to monitor feedbase. • Support to effectively use Cibo Labs monthly reports (feedbase) that will be available to all MLA members from July 2022. • Simplified, integrated and more usable software dashboards. • Lack of an effective Faecal NIRS service. • Effective in-field estimate of weights and numbers of cows and calves – learning from the limitations of the current WOW systems and trialling alternatives such as machine vision. **Possible adoption strategies:** • Train extension specialists on use, verification and refinement of the monthly forage reports on their pastures from Cibo Labs. Demonstrate the benefits of assessing pastures and how this technology could assist their productivity, business and profitability. • Whole-of-property scenario analyses that demonstrate the effectiveness and value of decision-support tools in exploring grazing and pasture management strategies to improve herd, financial and methane emission outcomes in different regions and climates. • Audit of existing 'management' technologies available (i.e. ease of use, effectiveness, benefits over other methods). Engage producers to trial technologies and identify which most suits their needs and potential refinements. Podcasts interviewing these producer's experiences. • Cost-benefit of technical advice to encourage more producers to invest in the advice of technical experts. • Modernizing the Grazing Land Management workshop program to incorporate new technologies and methods.

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					• Raise awareness of technology and tools through respected and unbiased sources. Then one on one or small group work to help assess technology/ tools best suited to the business, and help with adopting and using the chosen tool.
Animal wellbeing	3	NABRC NWQ WQ BRAC Kimberley KPIAC Pilbara	See R&D gaps coded as **N** or **O**	**Non-invasive alternatives to surgical procedures that achieve temporary sterilization to help manage breeding and production cycles** Producers need: • Ways to maintain and improve animal welfare standards in accordance with Australian and trading partner expectations. Castration and spaying are permanent, labour intensive and have negative short-term production outcomes. • Practical systems to grow and finish entire male cattle. **This will support:** • Market access and social licence. • Animal health and economic benefits. **Aligns with MLA Programs:** • Animal health and welfare • Productivity (on-farm) - Beef • Market access • Producer adoption	**R&D gaps** • Faster and longer acting pain relief products with very short withholding period. **N/O** • Non-invasive, highly effective and preferably reversible techniques for male and female sterilization. **N/O** • Assessment and prevention of health impacts of product residues on humans, animals and the environment. Ensure meat products are safe for human consumption. **N/O** • Objective measurement and monitoring of animal stress responses, pain and welfare. **N** • Understanding of consumer attitudes to different modes of achieving sterilization (to support adoptable practices). **N** • Early identification in bulls (e.g. as markers in weaners or from genotype) of the development of phenotypic secondary sexual characteristics, before slaughter age, that cause downgrading of carcasses in abattoirs. **N** • Development and validation of certification standards for animal welfare on property and a lifetime welfare index. **O** • Re-activate research/evaluation of chemical spayers (i.e. Pfizer, Bopreva). **N/O** **Adoption gaps** • Cost-benefits of non-invasive techniques (i.e. production, added customer-consumer benefits). • Pain relief options – practical, standardized application methods (including regard for user safety), that provide longer pain relief and assist with wound healing. • Sterilization strategies for different markets (i.e. bulls for export, weaners). • Criteria for lifetime welfare index.

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					• Growing recognition and acceptance by producers that addressing and improving animal welfare is an essential part of the 'social licence' to farm. **Possible adoption strategies:** • Processors and retailers communicating with industry about consumer expectations. • Cattle vets proactively engaged to educate their clients on the direct and indirect (e.g. mothering) impact and cost-benefits of pain relief. Case studies demonstrating pain relief adoption from each region – podcasts, QCL, etc. • Case studies (written or videos) of producers using these products/procedures in a range of regions. • Factsheet on cost benefit analysis of the different methods. Including information on administration of each method.
Feedbase	4	NABRC CQ NWQ NQ BRAC KPIAC NABRC Pilbara SEQ WQ SQ	See R&D gaps coded as **N** or **O**	**Prevention, restoration and management of rundown/degraded lands caused by long-term overgrazing, previous management, weed invasion or extreme and difficult to predict extreme events (i.e. drought, floods, dieback or fire).** Producers need: • Practical, economically sustainable strategies to avoid continuing damage (e.g. soil erosion) and improve (or maintain) productive capacity of their land.	**R&D gaps** • Ecology, establishment, optimal balance and management of native 3P grasses, legume, shrub and tree species (incl invasives) in major land types to support long-term rangeland health and production capacity through climatic variations/extremes. **N/O** • Effective and economically viable pasture and land restoration methodology for major land types including native rangelands and sown pasture systems, and for accelerating recovery of poor, C condition grazing lands. **N/O** • Determination and measurement of the key landscape functions which contribute to resilient and productive native, oversown and sown grasslands. **N** • Current land production capacity/condition, compared to historical records, and the likely influence of future changes/extremes in climate on land condition. **N** • Management strategies for grass+legume pastures to maximise dry season herbage yield and feed quality while maintaining long-term pasture composition and land condition. **O**

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				• Guidance on species selection, establishment techniques, preventing pasture rundown and invasion by undesirable species, and recovery from extreme events (eg, dieback, drought, flood, fire). **This will support:** • Improved preparation for/responses to extreme events, and thus resilience. • Measurable/verifiable environmental outcomes. • Reduce mortality from poisonous invasive weeds that often follow extreme events. **Aligns with MLA Programs:** • Animal health and welfare • Productivity (on-farm) - Beef • Capability building • Environmental sustainability (on-farm) • Grazing land management • Producer adoption • Weed control	• Labour efficient and cost-effective methods of improving the productivity and land condition of areas dominated by invasive weeds (e.g. Grader grass, Giant Rats Tail, Lantana, Love grasses, Asbestos grass). **N/O** • Identification of further adapted legumes in the collections to improve seasonal gaps in feed quantity and quality. **O** **Adoption gaps** • Value proposition/economic analysis of the benefits of improving, maintaining and restoring land condition. • Management strategies to minimise Indian couch spread in native and sown pastures, and improvement of pastures dominated by Indian couch. • Strategies to minimize and restore 'pasture dieback' lands. • Identification and testing, if necessary, of strategies for establishment, utilisation and maintenance of currently available introduced species (grasses and legumes) in oversown/augmented pastures. • Clarify role of P and S fertilizers in the establishment and maintenance of sown pastures in northern Australia. • Strategies for whole-of-property contingency plans/option paths to plan for extreme climatic events and fire, including managing regulations, infrastructure and sown pasture development, market (pricing) changes and herd structure. • Region-specific guides to native and introduced pasture species. • Integrated strategies for managing invasive grasses (e.g. grader grass, Giant Rats Tail, Love grasses, etc) and broadleaf (e.g. Pimelea) weeds, including appropriate grazing management that reduces the risk of degradation and weed invasion in the first place. **Possible adoption strategies:** • Update of GLM Edge package with new, regionally specific information, particularly for areas where sown pastures are dominant. • Pasture improvement workshops.

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					• Peer to peer groups working together on pasture rejuvenation projects. • PDSs and on-farm trials on establishing and options for managing key northern forage species. • Engaging NRM groups and extension organizations in field days that widen networks and the view of the issue(s), and explore producer's experiences.
Feedbase	5	NABRC CQ NQ NWQ SQ Kimberley	See R&D gaps coded as **N** or **O**	**Optimizing the tree-grass balance for both production (forage quality and quantity) and environmental outcomes (C sequestration, soil health, biodiversity).** Producers need: • Cost-effective and large scale-practical strategies and methods that enable rapid, strategic responses after drought, fire or floods. **This will support:** • Monitoring and management of weed and timber encroachment. • Minimizing woody thickening and maintaining biodiversity. • Managing perceptions of deforestation. **Aligns with MLA Programs:** • Environmental sustainability (on-farm)	**R&D gaps** • The magnitude of benefits and impacts of different levels of trees on the productivity of major land/pasture types. **N** • Identify 'target' tree/grass/shrub percentages to produce optimum economic, environmental & production outputs on major land types under various sustainability/revenue pathways (e.g. Carbon credits, carbon neutrality, biodiversity, etc.). **N** • Define 'healthy balance'/optimal proportions of tree-grass/shrub-pasture for sustainability that allows for seasonal variation in production systems on major land types and at the property scale. **N** • Labour efficient and cost-effective biological control strategies, including tools for decisions on introduced woody weed species. **N/O** • Tree locations for optimal production and environmental benefits at the property scale. **N/O** • Controlling *Carissa ovata* (Currant bush) in woodlands with non-mechanical means. **N** • Understanding population ecology of problem woody species & competitive interactions with the grass layer to prevent further encroachment(s). **N/O** **Adoption gaps** • Integrated grazing and fire plans on properties that commit to a "program" of management rather than one-off band aids.

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				• Grazing land management • Weed control • Producer adoption	• Economic analysis of benefits of managing the tree-grass/shrub balance and controlling native and exotic weeds. • Role of grazing management and fire in minimizing native and exotic woody weed invasion/encroachment. • Cost effective and practical management of native woody weeds and poisonous plants (e.g. Pimelea, Heartleaf, Georgina gidgee, gidgee, black wattle, mulga, mimosa, gutta-percha, sandalwood. • Cost effective and practical management of exotic weeds and poisonous plants (e.g. Parkinsonia, Mesquite, Prickly acacia, Calotrope, rubber vine, lantana, Harrisia cactus). **Possible adoption strategies:** • Grazing and fire plans (that incorporate spelling pre- and post-fire), informed by herd, forage and financial modelling. • Demonstration of cost-effective and practical management strategies for managing woody vegetation within current legislation for on-farm production and environmental benefits. • Potential PDS projects on major land types.
Animal wellbeing	6	NABRC CQ SEQ	See R&D gaps coded as **N** or **O**	**Better options for external parasite (i.e. ticks, buffalo fly) control.** Producers need: • Cost-effective, easy application and environmentally sound external parasite control options. **This will support:** • Reducing the risk of spread (especially the move southwards of external	**R&D gaps** • Understanding of Buffalo fly life cycle, mating/pheromones and the potential of attracting males to baits. **N** • More control options, different active ingredients, different control pathways for a greater arsenal to control external parasites. New approaches to an old problem (e.g. nano-formulations, Wolbachia). **N** • Testing the efficacy of methods that are currently being used, but remain to be validated, on animal performance, welfare and parasite control. Develop longer lasting control options. **O/N** • Identification of new genetic markers/mechanisms that confer chemical resistance in parasites to guide best management practice. **N**

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				parasites), the cost and stress of mustering/yarding and the reliance on chemicals. • Reducing the incidents of diseases and production loss associated with high fly loads, 3-day sickness and pink eye. • Addressing increasing consumer demand for chemical-free beef, impediments to movement of cattle in the supply chain, and reduces market/food safety risks. • Reducing production loss associated with buffalo fly irritation. • Reduce incidences of parasite resistance from inappropriate use of current treatments. **Aligns with MLA Programs:** • Animal health and welfare • Productivity (on-farm) – Beef • Pest management • Market access • Producer adoption	• Crush side gene-marker tests for parasite resistance to 'breed out' the problem. N • New, accessible control options (e.g. baiting, biocontrol stations) as used in the horticulture industry. **N** • Review of the effectiveness of current control strategies for external parasite control. **N/O** • Survey of the extent of parasite chemical resistance (ticks and BF). **N** • Benefits of rotational grazing strategies on external parasite populations. **N** **Adoption gaps** • Real annual cost and benefits of existing tools and new strategies for tick and buffalo fly control. • Making best use of current control tools and strategies. Regular review of new material and an awareness campaign. • Awareness of treatments that do not kill dung beetle populations/other beneficial insects. **Possible adoption strategies:**
IMPORTANT ISSUES ACROSS NORTHERN AUSTRALIA					
	Extra	KPIAC ASPIAC	See R&D gaps	**Crush side and field diagnostics to:**	**R&D gaps**

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		Kimberley Pilbara BRAC NQ	coded as **N** or **O**	• Select breeding traits/animals using genomic tests. • Measure and monitor objective markers of physiological stresses (e.g. for welfare and heat). • Measure nutritional status (diet and metabolites). • Test for diseases, toxins, plant secondary compounds. **This will support:** • Earlier and reliable detection of disease incursions. • Improve herd selection and economic performance and minimize trade and export risks. • Application of livestock genetics-based options for reducing methane emissions and stressors. • Enhance biosecurity awareness on property. • Improved decisions optimising nutritional management and meeting market specifications. **Aligns with MLA Programs:** • Animal health and welfare • Productivity (on-farm) – Beef • Pest management	• Development and refinement of sensitive and specific, point of contact diagnostic tests for diseases of major concern to northern producers. **N** • Development and validation of lower cost genomic tests (i.e poll, parentage, methane emissions). **N** • Tests for nutritional status and deficiencies (e.g. phosphorus, protein, energy and minerals) using Faecal NIRS and hyperspectral imaging. **N/O** • Tests for other markers of nutritional status and production such as compensatory growth potential, diet selected (important for methane production) and cattle use of key vegetation types in the landscape (e.g. browse, tannins, plants with specific secondary compounds). **N/O** • Tests for metabolites in blood, faeces and urine that are markers of reduced enteric methane, that have effects on current and potential growth rate and health (e.g. plant toxins, anthelminthic, heat stress). **N** • Markers in pregnant cows that are indicative of foetal health and mortality. **N/O** • Field deployable 'RAT style' tests for rapid diagnosis of 3-day, neospora, leptospirosis, pestivirus, FMD, LSD, etc. **N** • Markers in faeces, blood, urine that inform animal status. Adopting "Point-of-care" medical technology tests (spectroscopy and other approaches). **N** **Adoption gaps** • Awareness of abnormal/clinical signs. • Disease surveillance, diagnosis and investigation procedures. • Understanding of the full ramifications of a disease outbreak such as FMD or LSD in Australia (without causing panic!) • Digital access to assistance in rapid diagnosis of potential animal health issues. • Understanding and use of current and new genetic technologies. • Tail hair testing and N-use efficiency. • Information packages and extension for interpretation of test results.

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				• Market access • Genetics and genomics • Producer adoption	**Possible adoption strategies**: • Regional trials to test and improve crush-side diagnostics and surveillance protocols. • Once tests are proven to genuinely add value to a beef business, develop: i) short sharp targeted engagement strategies (e.g. Twilight Forums), and ii) short, practical 'how to' videos for the testing procedure and interpretation of results. • Explore options for reducing the costs of analysis of DNA samples.
	Extra	NQ SQ Kimberley Pilbara	See R&D gaps coded as **N** or **O**	**Building the capacity and capability of RD&A service organizations.** • A realistic understanding and acceptance by industry and government of the importance of high-quality applied science for profitable and sustainable cattle production systems in northern Australia. • Understanding of the benefits and how new and developing technologies can/will be integrated with established knowledge, experience and technologies to provide better outcomes for the industry. • Understanding and accepting that investment in quality research is high-cost, and especially with downsizing of (State) Departments of Agriculture and other public sector RD&A.	**R&D gaps** • Current RD&A capacity and trend(s) over time, industry needs and ways of matching future needs to future resources to meet expectations. **N** • Actual value of RD&A to the industry. **O** • Current limitations on service delivery, and economically sustainable models for delivering and growing extension services. **N** • Impact of the focus on Adoption on future R&D Capacity and the capabilities if researchers. **N** **Adoption gaps** • Willingness of industry to pay for service. • Addressing the COVID-induced disruption of networking and professional development opportunities. • Lack of long-term planning and recognition that it takes a couple of decades of training and experience to produce a mature and experienced scientist/advisor. • Identifiable and sustainable career path(s). **Possible adoption strategies**: • Funding and capacity for staff to engage with producers 'on site'. • A budget commitment to training young Australian scientists, supporting post-doctoral scientists, providing career pathways for young and mid-career scientists.

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				This will support: • Capturing knowledge and experience before it is lost through retirements or mortality! • Engaging future change agents. **Aligns with MLA Programs:** • Productivity (on-farm) - Beef • Capability building • Environmental sustainability (on-farm)	• Longer term project funding to ensure career pathways of young staff. • Funding/support for relevant graduate and post-grad education. (Note: Whole of industry/government coordination may be required.)
	Extra	NWQ SQ WQ	See R&D gaps coded as **N** or **O**	**Pro-active and adaptive management in preparing for and managing risks in variable environments and mitigating extreme events (heat, floods, drought, fire, disease).** This will support: • Resilience of extensive beef enterprises. **Aligns with MLA Programs:** • Productivity (on-farm) - Beef • Capability building • Environmental sustainability (on farm) • Grazing land management • Producer adoption	**R&D gaps** • Understanding the motivation of people to overstock and what can be done to reduce this behaviour to increase landscape and business resilience to market and seasonal shocks. **N** • Models to forecast scenarios/predict outcomes of extreme events. **N** • Economic impact of shade on animal performance. Lessons from the dairy industry. **O** **Adoption gaps** • Breed suitability to region. • Practices and infrastructure to reduce the impact on livestock production, performance, fertility and survivability. • Tools to aid proactive management decisions in extreme events. **Possible adoption strategies:**

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					• Whole-of-property contingency plans/option paths to plan for extreme climatic events, including managing regulations, infrastructure and sown pasture development, market (pricing) changes and herd structure. • Engage with financial advisors so people can work out how to diversify their activities/investments to reduce risk. • Coaching in pasture budgeting.
	Extra	NWQ WQ	See R&D gaps coded as **N** or **O**	**Minimizing any potential negative impacts of livestock transport on animal welfare and carcase quality.** **This will support:** • Understanding of economic and social benefits of minimizing stressful and costly practices and adoption of 'best practice'. **Aligns with MLA Programs:** • Animal health and welfare • Productivity (on-farm) - Beef • Market access • Producer adoption	**R&D gaps** • Technologies and practices to investigate the impact of transit scenarios on carcase quality and animal welfare outcomes. **O** • Development of a risk matrix for quantifying impacts of transport on carcass quality and welfare for varying circumstances such as age, temperament, previous transport experience or handling/confinement experience, body condition, pregnancy status, presence of horns, distance to travel, terrain (sealed, unsealed), climatic conditions, stocking density and mix, etc. **N** **Adoption gaps** • Financial and welfare benefits of 'best practice' transportation. **Possible adoption strategies:** • A central point for information for producers, transporters and other relevant parties to easily access. • Online publications, videos, webinars, training packages.