Final report

Project code: B.CCH.1062

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Date published: February 2011

PUBLISHED BY
Meat & Livestock Australia Limited
Locked Bag 991
NORTH SYDNEY NSW 2059

Profitable Meat Production Systems: Carbon Neutral Options

Demonstration Sites Workshop; Feb. 2011

Reducing Emissions from Livestock Research Program

Workshop Session Notes

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

ABSTRACT

The Carbon Neutral Options Workshop Session Notes report presents the outputs from a national meeting of researchers involved in demonstrating options for sheep and beef producers to reduce the net emissions of greenhouse gases from their operations. The meeting was convened by Meat & Livestock Australia as part of the Australian Government's Reducing Emissions from Livestock Research Program.

Drawing on their experience and expertise, the researchers developed preliminary drafts of research proposals in readiness for future funding applications. Sharing ideas and insights at the workshop strengthened the thinking behind the proposals and further developed ideas and initiatives for stronger collaboration between sites in different States. Greater standardization in approaches across sites will enable easier sharing of knowledge between regions, permitting producers to more readily access leading research findings.

EXECUTIVE SUMMARY

Through the Australian Government's Reducing Emissions from Livestock Research Program, Meat & Livestock Australia has been coordinating activities at sites across the nation to demonstrate greenhouse gas mitigation options for meat producers.

A national workshop was convened to assist the researchers from each project to contemplate how they could continue their work and further assist producers in grappling with issues associated with a carbon economy.

Workshop Objectives

The Carbon Neutral Options workshop aimed to:

- Consider the types of activities feasible at RELRP demonstration sites that will build on existing initiatives and help develop and promote carbon neutral production systems.
- Agree on auditing methods for carbon neutral production systems, or on means to develop agreement.
- Prepare draft investment proposals to maintain and enhance the benefits provided by each site.

Key Conclusions

Some key conclusions from the workshop were:

There are different audiences who will be interested in carbon and livestock emissions, e.g.:

- Producers just wanting to know what it's all about – to be aware
- Producers wanting to get involved:
    - Producers wanting to do 'the right thing' – morally or environmentally driven
    - Producers wanting to optimise profit – seeking to reduce risk etc
    - Producers wanting carbon neutrality to position their produce – needing detailed carbon data
- Service providers to industry wanting to know the issues, options and implications (e.g. bankers, farm input providers and ag-advisers)
- Policy makers want information on the effectiveness and costs of different options, and any likely barriers to adoption.

Different audience segments want different information:

- Producers want to see what the mitigation / sequestration options are which could suit their farming system and to talk with people who have first-hand knowledge.
- People need to understand the carbon cycle and have access to data on it – for emissions and sequestration.
- Those contemplating taking action will need to understand the policy environment, the jargon, the different administrative options they have and the tools that may help them decide. The implications on their enterprise of changing management and of adopting alternative administrative options must be understood.

Standard demonstration options are:

- Demonstration sites to show measuring techniques and locally relevant management options; linked to research.
- Models and systems analysis to understand the long term and whole-farm implications of management options.
- Events and media activity for contact with a wider audience and to present varied information; using demonstration sites and activities as a focus and outlet for carbon farming information.

Demonstration activities will lead to:

- More knowledge, better understanding and a more positive attitude to carbon issues.
- Increased profit, sustained production and increased carbon sequestration; with reduced net greenhouse gas emissions and lower seasonal production risks.
- Increased involvement by producers in aspects of a carbon economy; be it through trading and/or promoting their carbon credentials.

Preliminary research proposals were drafted at the workshop and will form a basis for future funding applications.

Profitable Meat Production Systems – Carbon Neutral Options
Demonstration Sites Workshop; Feb, 2011
Reducing Emissions from Livestock Research Program

Workshop Session Notes

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Prepared for Meat & Livestock Australia,
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WORKSHOP SESSION NOTES

Workshop 1. Feasible demonstration activities

Summary

There are different segments, e.g.:
- Producers just wanting to know what it's all about – to be aware
- Producers wanting to get involved:
    - Producers wanting to do 'the right thing' – morally or environmentally driven
    - Producers wanting to optimise profit – seeking to reduce risk etc
    - Producers wanting carbon neutrality to position their produce – needing detailed carbon data
- Service providers to industry wanting to know the issues, options and implications (e.g. bankers, farm input providers and ag-advisers)
- Policy makers want information on the effectiveness and costs of different options, and any likely barriers to adoption.

Knowledge needs

There are general and specific needs, with different segments wanting different information:
- Producers want to see what the mitigation / sequestration options are which could suit their farming system and to talk with people who have first-hand knowledge.
- People need to understand the carbon cycle and have access to data on it – for emissions and sequestration.
- Those contemplating taking action will need to understand the policy environment, the jargon, the different administrative options they have and the tools that may help them decide. The implications on their enterprise of changing management and of adopting alternative administrative options must be understood.

Feasible activities

Standard demonstration options are:
- Demonstration sites to show measuring techniques and locally relevant management options; linked to research.
- Models and systems analysis to understand the long term and whole-farm implications of management options.
- Events and media activity for contact with a wider audience and to present varied information; using demonstration sites and activities as a focus and outlet for carbon farming information.

Benefits

Demonstration activities will lead to:
- More knowledge, better understanding and a more positive attitude to carbon issues.
- Increased profit, sustained production and increased carbon sequestration; with reduced net greenhouse gas emissions and lower seasonal production risks.
- Increased involvement by producers in aspects of a carbon economy; be it through trading and/or promoting their carbon credentials.

WORKSHOP SESSION NOTES

Knowledge needs

Practical options

- What's the impact on me? What are the mitigation options?
- To 'see it on the ground' – i.e.:
    - Low methane livestock / grazing
    - Total GHG emissions on a 'regular' farm
    - To contextualize and clarify the GHG issues
    - Economics
    - Collateral benefits – from trees for example
- What farming system gives me the lowest carbon footprint?

Contacts to talk with

- People to contact - producers who have applied options
- Expert advice on:
    - When to get involved
    - How to avoid stuffing it up
    - How to sift through the snake oil salesmen

Data and specific information

- Ballparks and benchmark figures for a whole range of factors
- Who has measured methane production and how does it relate to my farm?
- Life Cycle Assessments??
- Soil carbon permanence.
- Carbon cycle – emissions, services and sinks on their property and the net effect (management practice doesn't equate to carbon neutrality)
- Soil and woody vegetation

Understanding the implications of getting involved

- Confidence that new technologies or strategies will result in:
    - Improved profitability of the business
    - Reduced risk and/or make the business more resilient (reduced variability in a more sustainable and predictable system)
    - Improved efficiency and on-farm lifestyle
- The time requirements involved in mitigation
- The $ question behind every potential change
- Financial implications – make money or cost money?
- Cost and potential abatement information (MACCs)
- Marginal cost curves

Understanding of the policy environment and tools available to assist

- Clear understanding of the policy and science. Language barrier broken down regarding metrics, measurements and carbon cycle.
- Timing alignment between research and policy – communicating progress
- Accounting tools to support protocols - productivity, economics, emissions, abatement technologies; B/L calculations and emission projections
- Assessment of existing tools to identify gaps
- CFI vs ETS

Climate projections

- Climate projections need some clear and concise messages of the approach, sensitivity and likelihoods.
- Predictions (climate) for the local region

WORKSHOP SESSION NOTES

Feasible activities

On-farm demonstrations, linked to research

- On-farm demonstrations of mitigation options
- Local demonstrations to accurately reflect adoption/adaptation on 'their piece of dirt'
- Monitoring - long term data sets reflecting different seasons and changes
- Growing forages with methane reduction capacity
- Breeding low-methane animals
- Use of N inhibitors – NZ findings not reflecting Australian findings (temperature effects)
- Showing farm GHG emissions in the context of an actual site (contextualizing GHG)
- On-farm demonstration of measuring techniques; e.g. Canadian 'Gro-Safe' techniques for measuring gas when feeding
- Demonstrations and events linked to research
- Multiple 'satellite' sites of adoption on commercial enterprises with variations in implementation > greater learning
- Advisory groups – two-way communication

Models and system analysis

- Economic modeling to show the profitability of carbon neutral farming
- Sound systems analysis of the demonstration for an annual cycle > yearly analysis for extension
- Whole-farm enterprise options
- Scenarios for 'what to do with your carbon' – working through a 'future farm' game to help demonstrate alternative scenarios
- Mapping carbon farming options on properties

Events and media activity

- Traveling roadshow of key speakers with relevant information
- Local champions of adoption / adaptation
- 'Speed dating with the expert' – opportunities for farmers to talk about issues they're interested in
- Use wider media
- Target 'trusted voices' – Master Class for ag-advisers, service providers and financiers

WORKSHOP SESSION NOTES

Benefits

Better understanding and more positive attitudes
- Aware of solutions being developed
- Local information and knowledge – clarity and demystification of the GHG issue
- More knowledge and more sharing
- More ownership and understanding from local producers
- Benchmarking
- Reduced fear of GHG as a threat

Improved production and profit; with carbon and greenhouse gas benefits
- Less waste (greater efficiency) > more protein and increased production
- Increased profit through reduced costs
- Sustainable profit and buffering against risks
- Co-production benefits – full economic disclosure – production benefits and carbon benefits
- Collateral benefits – enhanced biodiversity, reduced salinity and erosion, shelter for stock with better fertility and reproduction rates.

Participation in the carbon economy
- Lower barriers to entry > reduced start-up costs
- Reduced transaction costs
- Increased efficiency > increased participation in the CFI
- Meeting industry, community and government objectives

WORKSHOP SESSION NOTES

Plenary sessions

Models and measures

Different models and measures may be used to meet local conditions and information needs. However, all sites should be able to:

- Biophysical – use the SGS Pasture Model for biophysical modeling
- Key numbers – present key data using the FarmGAS calculator; along with a description and justification of any modifications to assumptions used in the calculator.

Access to a common economics adviser will enhance the use of comparable or standardized approaches to the analysis and presentation of costs and benefits, including post-simulation analysis of results from the SGS Pasture Model.

An occasional 'harmonisation' workshop for those involved in modeling and system analysis will further enhance and standardize the approaches to biophysical, financial, whole-farm and economic analysis.

Objectives and scope

Different stakeholders have different needs:

- Government wants a net reduction in greenhouse gas emissions – a smaller carbon footprint.
- Industry wants to justify an image to consumers of environmental responsibility – aspirations of carbon neutrality.
- Producers want profitable production systems – and some will be interested in carbon farming options.
- Research wants to generate useful knowledge on measuring and emission reduction options – and how to integrate that information for application in farming systems.

Demonstration activities relating to the reduction in greenhouse gas emissions from livestock have the potential to:

- Advance the aspirational goal of carbon neutral farming systems
- Provide immediate evidence, data and information about carbon and management options to profitably reduce net emissions
- Generate integrated knowledge of the implications of different management options for a range of farming systems and climates
- Focus, synthesize and disseminate information about carbon policies and carbon farming opportunities; to farmers and other stakeholders.

WORKSHOP SESSION NOTES

Workshop 2. Site Proposals

Draft Proposal – WA Site

Site:
UWA Future Farm – Pingelly WA
(A Nth WA site as well?)

Project Title:
Managing carbon in farming systems with livestock.

Objectives:
To inform producers about options for, and processes of, change for 2050 farming.

Outcomes:
- Modeling emissions and profitability of UWA Future Farm.
- Quantification and ongoing monitoring of carbon management and responses to mitigation.
- Planning and managing redesign of farmed landscapes.

Method:
- Model the farm, including finance, using optimization and simulation modeling and link to FarmGAS.
- Engage existing GHG emissions teams to benchmark the farm and monitor ongoing change from mitigation strategies (soil, methane, nitrous oxide and water).
- Use outputs from modeling and benchmarking to make decisions for managing carbon (reshape the farm) – establishing a team including ecosystem and farm management expertise.
    - Demonstrate that in 2050 there will be need for farmers to call in more diverse expertise.)
    - Link to all demonstration sites across Australia through modeling decision making.

Pathways to Adoption:
- Engagement with producers on-site and participate in field days at other national sites.
- Engage the participation of experts in 4th generation adoption, uptake and change. Apply different strategies for different sectors.
- Communicate through MLA, DAFF, Institute and rural communication networks.

Benefits to producers:
- Higher profitability
- Smaller carbon footprint
- Diversification of inputs and outputs
- Confidence in the future

Alignment with Government policies:
Australia's Farming Future
Relevance to CFI developments
Can inform government policy makers.

Contact Person: Name, email & phone
Philip Vercoe, UWA

WORKSHOP SESSION NOTES

Draft Proposal – NSW Trevenna

Site: Trevenna
Project Title: Demonstration projects for on-farm practical methane management strategies.
Objectives: • Increase landholders awareness of managing carbon, methane and nitrous oxide. • Create an industry specific, region specific, site for disseminating knowledge.
Outcomes: • Illustrate a 20% change in GHG emissions per live-weight (kg) and wool (kg) between the contrasting production systems. • Demonstrate a potential 50% reduction in the carbon footprint.
Method: • Continue contrasting production system analysis. • Carbon capture options; eg bio-char and woody vegetation. • Seasonal measurements of flocks using SF6. • Modeling alternative management strategies to improve carbon balance. • Delivering local case studies of modeling and Life Cycle Assessments for landholders.
Pathways to Adoption: • Deliver timely and relevant key messages from Trevenna to target audiences. • Investigate current knowledge of N.T. producers. • Use NT case study to demonstrate LCAs to audience. • To support producer advisor group in their increase in knowledge of Trevenna GHGs.
Benefits to producers:
Alignment with Government policies:
Contact Person: Name, email & phone Malcolm McPhee, Industry NSW

WORKSHOP SESSION NOTES

Draft Proposal – NSW, Glen Innes

Site: Glen Innes
Project Title: Low emission beef production in southern Australia.
Objectives: Demonstrate effective integration of methane mitigation and carbon capture into commercial beef production enterprises.
Outcomes: • NSW local data on the efficacy of emerging methane mitigation technologies. • Leading candidate technologies implemented in display herd. • Reduced carbon footprint of beef through integration of carbon capture in soil and woody vegetation. • Presentation of findings in national training program.
Method: • Initial proof of principal of mitigation with measurement by SF6; defaunation, oilseed, genetics for methane and RFI, nitrate. • Apply a select set of effective technologies in a farming system trial. This will be based on existing divergent methane and feed efficiency cattle. • Use novel technologies (eg CSIRO bolus) to quantify emissions.
Pathways to Adoption: The Trevenna model of field days, media, and State roadshows will be replicated. It is expected that field day sessions can be webinared and will fit with the extension program being arranged by the national consultant.
Benefits to producers: See 'tomorrow's technology today'.
Alignment with Government policies:
Contact Person: Name, email & phone

WORKSHOP SESSION NOTES

Draft Proposal - Modelling

Site:

Project Title:
Optimise profitability in carbon neutral livestock systems.

Objectives:
Optimise profitability in carbon neutral livestock systems.

Outcomes:
- Availability of tools for biophysical and LCA carbon models of livestock systems.
- Assessment of economically viable carbon-neutral livestock systems.
- Prediction capacity for carbon management.

Method:
- Integrated pasture system model with soil carbon, carbon dioxide, nitrous oxide and methane.
- Incorporate trees and inform economic modeling.
- Provide information for simultaneous LCA analysis.
- Long-term (> 100 years) analysis and projections.
- Optimise grazing management, species composition, tree planting; based on carbon targets and economic profitability.
- Include the impact of fire, with specific consideration for northern Australia.

Pathways to Adoption:
- Liaise with producer groups and demonstration sites.
- Demonstrate outcomes through workshops, articles etc.

Benefits to producers:
Implementation of economically viable carbon efficient systems.

Alignment with Government policies:
Aim to achieve emission reductions.

Contact Person: Name, email & phone
Ian Johnson, IMJ Consultants

WORKSHOP SESSION NOTES

Draft Proposal - Victoria

Site: Western Victoria
Project Title: RELRP Extension – 2011
Objectives: Promote productivity gains from research: Feed conversion efficiency, especially through feeding aspects and genetic aspects.
Outcomes: Developing more resilient systems that protect producers in the future (risk management). The more efficient systems have carbon advantages – these advantages will be brought more heavily into future programs.
Method: Focus on increased productivity and less loss – not on climate change. Field days at Hamilton (late October) and DemoDairy (mid-May). • Incorporate FarmGAS speaker into program. • Have a case study of a local farm's carbon footprint, run through FarmGAS. At DemoDairy day also have a presentation predicting pasture production variability into the future (Brendan Cullen, Uni of Melbourne); the speaker on forage systems to address these forage supply issues (= making a more resilient system and reducing risk).
Pathways to Adoption: As above.
Benefits to producers: Improved efficiency is a lead-in for all activities.
Alignment with Government policies: Field Days will help identify barriers to adoption, to be dealt with in subsequent phases.
Contact Person: Name, email & phone Graeme Ward, DPIV

WORKSHOP SESSION NOTES

Preliminary thoughts - SA

Site: Struan (and others?)
Project Title: Demonstrating tomorrow's carbon technologies today.
Objectives: Awareness of carbon challenges. Awareness of carbon options. Awareness of what tools are out there.
Outcomes:
Method: Some options: • Demonstrate methane and nitrous oxide measurements under different grazing systems; beef cattle, prime lambs, wool sheep, irrigated pastures, dryland pastures, technograzing. • Carbon reduction; benchmark, economics, LCA, carbon neutrality. • Demonstrate what new technologies are available or coming.
Pathways to Adoption: • Field days • Industry presentations • Demonstration of technologies
Benefits to producers:
Alignment with Government policies:
Contact Person: Name, email & phone Nick Edwards, SARDI

WORKSHOP SESSION NOTES

Preliminary thoughts – Northern Australia

Site:
Two demonstration 'projects/sites':

- Lansdown (DAFF) – may demonstrate tools
- Climate-Clever Beef (CCRP2 demonstration sites) – six sites with a range of management practices.

Project Title:

Objectives:
Demonstrate tools and different management practices.

Outcomes:

Method:
Possibility to incorporate process-based models at these sites? The SGS Pasture Model's applicability to northern Queensland? The challenge is mechanistic – parameterization of northern systems. Check using other process models for validation, e.g. Century, GRASP inside APSIM? Is the animal defined, herd structure, soil, pastures etc. How to predict live weight gain? Discuss with Peter Thorburn?

Pathways to Adoption:
Both groups working together regarding communications.

Benefits to producers:
Evidence to inform policy on mitigation and associated costs of land change and alternative scenarios; e.g. documentation of current practices and alternatives to these benchmarked practices.

Identification of alternative systems approaches helps inform policy of effects of these mitigation options; e.g. destocking versus fire effects. It will help identify any perverse outcomes associated with climate change management.

Alignment with Government policies:

Contact Person: Name, email & phone

WORKSHOP SESSION NOTES

Next Steps

February, 2011
- Demonstration sites workshop
- Steering Committee meeting
    - Roadmap from here till June 2012
    - Funding for modeling work
    - Gap analysis / future planning

March, 2011
- Industry presentations
- Technical meeting – gap analysis
- Steering Committee meeting

Mid-2011
- Whole of program review

July-August, 2011
- Options (ex-modeling) for demonstration sites
- Knowledge integration – harvesting and synthesis of key learnings / themes*

August-September, 2011
- Future RD&E options to DAFF

October-November, 2011
- Field days and Roadshows – cross-site collaboration*

December, 2011
- Final reports

June, 2012
- Program ends (> RELRP II??)

* Through individual discussions at the conclusion of the workshop it was suggested that;
- It would be useful to share key learnings across sites and develop key themes for future communication and reporting, in July/August, 2011.
- Collaborate to share expert resources and optimize their input to field days or other 'roadshow' type events, in October/November, 2011.