Holbrook Landcare Network

carbon farming and your business

On-farm Greenhouse Gas Emissions Case Study Series

#08 Mixed farming enterprise, Morven NSW

Net on-farm greenhouse gas (GHG) emissions

686.73 t CO_2-e

(see Table 1 overleaf)

Emission reduction options:

Tree plantings
Enterprise selection
Dietary supplements

There is an ongoing need to manage cost of production and the challenges of climate change through better management, increased flexibility and a constant review of current activities

PROPERTY SUMMARY

This is a 620 ha property, in the Morven area of southern New South Wales with an annual rainfall of 600mm. The property has an enterprise mix of cropping, beef cattle and sheep.

STOCK

- 180 self-replacing, winter calving Euro cross and Angus cattle.
- 700 self-replacing Merino ewes.
- 800 self-replacing, White Suffolk ewes.

PASTURES

Pastures are a mix of sub-clover, annual ryegrass and phalaris based.

CROPS

200-300 ha of wheat, canola and lupins

FERTILISER APPLICATION

Pastures are fertilised with 100 kg/ha superphosphate ever 1-2 years. Cereal crops receive 100-120 kg/ha mono-ammonium phosphate (MAP), 2-3 in-crop applications of 50 kg/ha of Urea to wheat and canola is fertilised with Gran-Am.

FODDER PRODUCTION

100-150 tonnes of hay is produced annually and 20 ha of oats is sown for stock feed.

TREE PLANTINGS

Currently, 24 ha (3.9% of property) has been revegetated.

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TABLE 1. ANNUAL ON-FARM EMISSION SUMMARY

Emissions	Current emissions (t CO_2-e)
CO_2 - Carbon dioxide emissions from diesel & electricity usage	42.80
CH_4 - Enteric methane from livestock	879.84
CH_4 - Methane from livestock manure	0.20
N_2O - Nitrous oxide from livestock dung & urine	72.86
N_2O - Nitrous oxide from fertiliser; mainly urea	74.77
N_2O - Nitrous oxide emitted from cropping	124.50
Indirect N_2O - atmospheric deposition, leaching & volatilisation	160.15
Tree plantings (after 1990)	- 664.34
Carbon stored in wool	- 4.06
Total on-farm GHG emission	**686.73 t CO_2-e**

MODELLED EMISSION REDUCTION OPTIONS

Tree plantings

Increase tree plantings to a total of 32 ha (5.16% of the property) to offset the total GHG emissions by 65.5%, and decrease net on-farm GHG emissions to 465.28 t CO_2-e.

Enterprise selection

The property has numerous enterprises and consideration may be given to selecting and expanding the two best enterprises and discounting the others. If the cattle enterprise was discontinued, and sheep increased to a similar stocking rate, there would be a 31% reduction in emissions down to approximately 475 t CO_2-e.

ADDITIONAL OPTIONS

Dietary supplement

Research has indicated that using natural compounds such as tannins, fats and oils can reduce methane emissions by 15-20% when used as a dietary supplement, and provides the animal with energy and protein[1]. Supplementing the beef herd's diet with such an additive inhibits micro-organism activity in the rumen could reduce methane emissions and could lead to better feed utilisation in cattle.

References

1. DAFWA. (2013). Carbon farming factsheet - reducing methane emissions from beef cattle using feed additives. *Department of Agriculture and Food, Western Australia*. Retrieved from www.agric.wa.gov.au/climate-change/carbon-farming-factsheet-reducing-methane-emissions-beef-cattle-using-feed-addtives

The GHG emissions have been calculated by inputting the figures provided by the landholder into the Greenhouse Accounting Framework (GAF) calculators from www.greenhouse.unimelb.edu.au/Tools.htm.These figures and options only take into account actual on-farm emissions, and do not take into account any off-farm GHG emissions.

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