Holbrook Landcare Network

carbon farming and your business

On-farm Greenhouse Gas Emissions Case Study Series

#01 Beef/sheep enterprise, Holbrook NSW

Net on-farm greenhouse gas (GHG) emissions

2,191.68 t CO_2-e

(see Table 1 overleaf)

Emission reduction options:

Tree plantings

Switch lambing period

Opportunities have been taken to plant tree lots, with further revegetation work planned in the future

PROPERTY SUMMARY

This is a 1,600 ha property in the Holbrook area of southern New South Wales with an annual rainfall of 850mm. The main enterprise is beef cattle, as well as prime lambs and wool.

STOCK

- 500 self-replacing, spring calving Hereford cattle with steers sold at 400kg.
- 2,500 self-replacing, autumn lambing merino ewes for wool and fat lamb production.

PASTURES

Pastures are largely phalaris and sub-clover based with some native pastures on the hills containing annual grasses such as ryegrass.

FERTILISER APPLICATION

Superphosphate is applied every three years at 125 kg/ha. Lime is applied every 10 years with soil acidity a problem for this property.

SUPPLEMENTARY FEEDING

Hay is produced on-farm (170 tonnes) however, moving towards producing on-farm silage (250 tonnes).

TREE PLANTINGS

Currently 1% (~ 15 ha) of the 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	51.17
CH_4 - Enteric methane from livestock	2,265.35
CH_4 - Methane from livestock manure	0.46
N_2O - Nitrous oxide from livestock dung & urine	211.36
N_2O - Nitrous oxide from fertiliser; mainly urea	0.00
N_2O - atmospheric deposition, leaching & volatilisation of nitrous oxide	236.52
Tree plantings (after 1990)	- 568.18
Carbon stored in wool	- 5.00
Net on-farm GHG emissions	**2,191.68**

MODELLED EMISSION REDUCTION OPTIONS

Tree plantings

Increase tree plantings from 15 ha to 35 ha (2.19% of the property) to offset total GHG emissions by 48%, and reducing the net on-farm GHG emissions to 1434.10 t CO_2-e.

Switch the lambing period

Switching from autumn lambing to spring lambing can reduce total GHG emissions by approximately 398 t CO_2-e, or 14%. It could also result in increased fertility and better matching of feed demand and supply, reducing the cost of production.

ADDITIONAL OPTIONS

Dietary supplement

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

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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