PIRSA

Carbon Opportunities in the South Australian Mallee

Literature Review
Abbreviated summary to include the list of carbon farming practices that apply to the Mallee

Information current as of 10 May 2021

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SOUTH AUSTRALIA

Government of South Australia
Primary Industries and Regions SA

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Disclaimer

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Summary of Findings

- South Australia's poor uptake of carbon farming projects is influenced by the lack of concise information, limited understanding on project methodologies and requirements, uncertainty around who is available to support and assist and current farming systems, i.e. most farmers readily practice stubble retention and no till.

- Offsetting carbon opportunities in the Mallee exist through either the Emission Reduction Fund (ERF), voluntary carbon markets and independent carbon farming.

- Regardless of the type of opportunity, there is growing industry acceptance that carbon farming practices also achieve other co-benefits such as reducing erosion, improving soil structure and fertility, increased biodiversity and plant productivity, buffering against drought, improved animal health and increased water efficiency.

- There are six broad components of agricultural emissions, five of which apply to the Mallee and include: field burning of agricultural residues, enteric fermentation, manure management, agricultural soils and vegetation burning or clearing.

- The Mallee encompasses varying environmental conditions, with variable low to medium rainfall spread across the region, as well as variable soil types. As a result, the approach of 'one-size fits all,' is arguably unattainable in regards to applying ERF methods.

- Most carbon framing practices listed in this review are achievable in the Mallee, regardless of them being an eligible method in the current carbon market e.g. ERF. However, practices that are most applicable to the Mallee under an ERF method appear to be environmental plantings in the form of windbreaks, converting urea lick blocks to nitrate lick blocks for beef cattle, improved herd management (refer to page 24 for full list of practices), applying nutrients and soil amendments, revegetation of Mallee scrub, animal effluent management and cropping and pasture management.

- Major limitations for farmers participating in carbon markets appear to be cost to establish and manage an ERF project, and misunderstanding, particularly of ERF methods. ERF methods, voluntary markets, as well as additional governmental support programs and incentives are constantly evolving. There seems to be significant government and industry investment and effort underway to encourage more farmers to participate.

Table 9. Summary list of carbon farming practices that apply to the Mallee.

Category	Carbon Farming Practice	ERF Method	ERF considerations	Independent
Vegetation	Revegetation of mallee scrub (including windbreaks)	X		X
Vegetation	Revegetation using grasses and fodder shrubs	Maybe an option in the future (refer to page 23)	Can fall under the 'measurement of soil carbon sequestration in agricultural systems', method if production livestock can graze. However, will only include perennial grasses, annual grasses and/or legumes	X
Vegetation	Replanting land no longer suitable for cropping	X		X
Vegetation	Avoid clearing e.g. repeated clearance ever 5 years to satisfy Native Veg Act 1991	X		X
Soil	No till	X		X
Soil	Cropping and pasture management, g.g. stubble retention (prevent burning off stubbles) improving pasture legume content before cropping to reduce the N fertiliser, summer cover, multi-species cropping, increasing the efficiency of nitrogen use through improved fertiliser technology and management in cropping systems, converting from continuous cropping to permanent pasture, use of mechanical methods to add or redistribute soil	X	De-stocking of the land under pasture must not be conducted unless the land is converted to be a cropping system Nutrients that can be added include nitrogen, phosphorous, potassium and sulphur. Summer cover / multi-species cropping may fall under the activity 're-establishing or rejuvenating a pasture by seeding' or 'establishing and permanently maintaining a pasture where there was previously no pasture such as on cropland or bare fallow.' Will only include perennial grasses, annual grasses and/or legumes The fertiliser practices do not fall under a specific activity however may contribute if a farmer can prove that it 'enhances plant growth and fertility of soil.'	X
Soil	Soil amendment e.g. biochar, clay-spreading, green or brown manure, lime, gypsum	X	Green or brown manure may qualify if it is sourced from a *designated waste-stream*: • intensive animal production	X

Category	Carbon Farming Practice	ERF Method	ERF considerations	Independent
	Soil amendment e.g. biochar, clay-spreading, green or brown manure, lime, gypsum		• Food processing • Manufacturing • Sawmill residue or • Municipal or commercial waste collection processes. The 'non-synthetic' fertiliser should also be sourced from within a 'carbon estimation area' (CEA) that is part of the project Clay spreading is allowed if sourced from the project's CEA. Sampling must be taken at depth and any land where soil is sourced is remediated as soon as practical	
Livestock	Animal effluent management e.g. treatment in biogas digesters; decreased manure storage time; improve manure storage covering; improve housing systems and bedding; manure acidification.	X		X
Livestock	Feed additives to dairy cows	X	Must be milking pasture-fed cows for at least nine months of the year. Eligible additives include: canola meal, cold-pressed canola meal, brewers grain, hominy meal or dried distillers grain	X
Livestock	Supplementary feeding and feed inoculants e.g. low methogenic pasture species for grass fed animals, converting urea blocks to nitrate lick blocks	X - Does not apply for sheep at this point in time (refer to page 26)	Land where beef cattle herd is pastured has to have been used for urea supplementation at least once in the last five years to be eligible under the 'feeding nitrates to beef cattle method.' This method only considers fully or partially replacing urea supplements with nitrate supplements (nitrate lick blocks). Feedlot cattle are excluded from this method. Feeding with improved pastures falls under the Beef Cattle Herd Management method.	X

Category	Carbon Farming Practice	ERF Method	ERF considerations	Independent
Livestock	Animal breeding and genetic manipulation e.g. faster growth rates, reducing age to slaughter, reduce methanogenesis, improve feed conversion efficiency	X	Cattle has to be fed principally from grazing or forage Most of these practices will fall under the 'cattle herd management' method. Project's under this method cannot apply if feeding of cattle on land has been, for the purposes of the project, partially or wholly cleared of perennial woody vegetation	X
Livestock	Reducing CH4 production by vaccinating livestock against methanogens	Not specifically however maybe eligible if farmer can prove that by doing so it: increases the weight to age ratio, reduces the average age of the herd, reduces the proportion of unproductive animals and/or increase total annual liveweight gain by changing ratio of livestock class		X
Livestock	Herd management, e.g. changing number of animals in each livestock class, reducing proportion of unproductive animals in a herd, increased pasture productivity and suitable pasture species selection, improved stocking rates (for sheep: reducing total sheep numbers by mating all replacement ewes to Merino sires or by buying replacement maiden ewes or adult ewes to run a sustainable stocking rate)	X - Does not apply for sheep at this point in time	Cattle has to be fed principally from grazing or forage Most of these practices will fall under the 'cattle herd management' method. Project's under this method cannot apply if feeding of cattle on land has been, for the purposes of the project, partially or wholly cleared of perennial woody vegetation	X

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