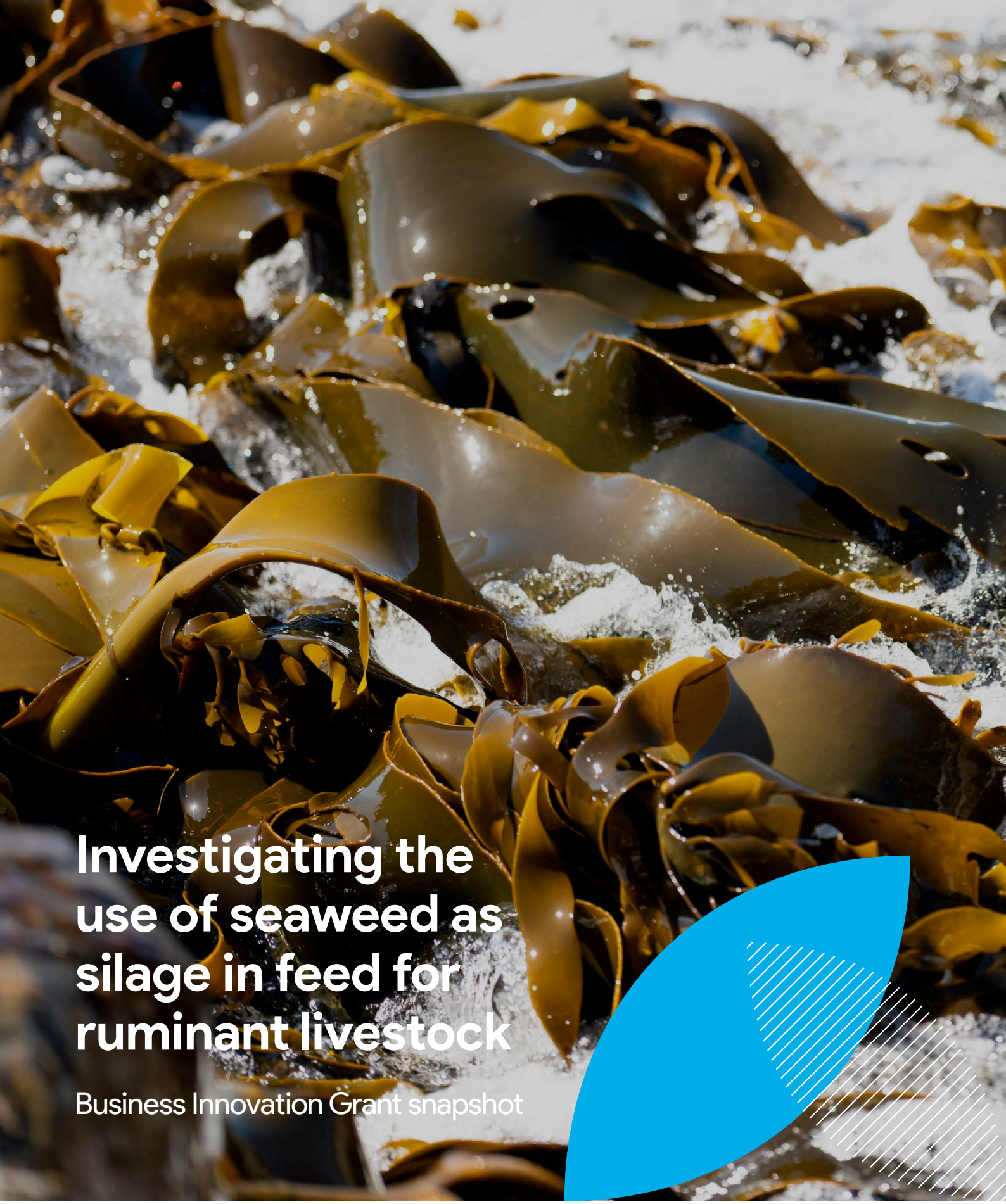

Investigating the use of seaweed as silage in feed for ruminant livestock

Business Innovation Grant snapshot

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Overview

This project sought to build the business case and potential market for farmed seaweeds that can be used within pasture-based livestock systems, as a silage admix. Currently, beef and dairy producers in southern Australia are moving to increase their use of silage as a year-round fodder supplement, and this medium provides a convenient delivery mechanism.

The initial project methodology was based around sourcing seaweed as feedstock for making silage, testing a methodology for making silage and assessing the nutritional value of the end product. However, difficulties were encountered in sourcing seaweed feedstock and practical problems emerged related to making silage from seaweed.

The research determined there would not be a market for farmed seaweed as a feedstock for making silage, as it is not an affordable option given the cost of production and competition from the nutraceuticals industry.

Further, sourcing wild-harvested seaweed and processing this to make silage does not appear to be practical for farmers, given the necessary equipment and high labour costs involved. However, there are potential opportunities for harvesting seaweed from areas where it is a nuisance with adverse ecological impacts, and processing this to manufacture other farm inputs.

Emerging new evidence from other research has also demonstrated ensiling seaweed would not provide the hypothesised nutritional advantages if used as livestock fodder.

Industry challenge

This project sought to build the business case and potential market for farmed seaweeds that can be used within pasture-based livestock systems, as a silage admix. Currently, beef and dairy producers in southern Australia are moving to increase their use of silage as a year-round fodder supplement, and this medium provides a convenient delivery mechanism.

Objectives

The initial objectives of the project were:

1. Expand the future market for farmed seaweed within pasture-based livestock industries through farming new seaweed species appropriate as silage feedstock.
2. Identify the price point at which these ensiled seaweed supplements would be attractive to livestock farms based on the return on investment.
3. Review the return on investment of producing and using ensiled seaweed.

Based on the problems encountered in cost-effective sourcing of seaweed and processing it on farm to make silage (see below), the objectives were amended to documenting these problems and producing two fact sheets about other potential uses of seaweed in agriculture, and the regulatory reforms required to facilitate this.

Methodology

The initial methodology was based around sourcing seaweed as feedstock for making silage, testing a methodology for making silage and assessing the nutritional value of the end product. In particular, there was interest in discovering whether the ensiling process would modify the content of minerals detrimental to livestock if fed in large quantities, such as iodine. If this was found to be the case, it would enable seaweed to be a more significant component of livestock fodder.

Unfortunately, the project unearthed difficulties in sourcing seaweed feedstock and practical problems for farmers in making silage from seaweed. The eventual methodology, including the experiments conducted, was as follows:

1. Desktop research on silage making from seaweed feedstock.
2. Field research into potential sources of seaweed feedstock.
3. Obtaining permits for (limited) collection of beach wrack as the only accessible source.
4. Collection, washing, shredding, inoculating and packing trial amounts of seaweed for silage manufacture.
5. Conclusions about the practical problems experienced and the implications for farmers seeking to adopt this practice.
6. Further desktop research into other possible uses of available seaweed feedstock as an agricultural input, and the regulatory reforms required to facilitate this.

The production of two fact sheets that reflect the project findings was an amended output of this work.

Key findings

The findings from the ensiling trials, consultations and desktop research were as follows:

1. Farmed seaweed is not an affordable source of feedstock for making silage or for other agricultural inputs, given the costs of production and competition for seaweed from competing markets, such as nutraceuticals.
2. Harvesting wild seaweed from lagoons would be cost effective for farmers and is an environmentally desirable sourcing method, but this is activity is currently restricted by regulatory authorities.
3. There are, however, potential opportunities to harvest seaweed from areas where it is a nuisance with adverse ecological impacts, and processing this to manufacture other farm inputs. Regulatory reform is required to facilitate productive use of this wild-harvested ‘nuisance’ seaweed.
4. Collection of beach-deposited seaweed wrack is permitted in some but not all jurisdictions, and is an environmentally desirable means of reducing highly toxic greenhouse gas and ozone-depleting emissions from rotting seaweed.
5. There are practical problems in predicting the availability of seaweed for silage, as well as quality control when making the silage. Composting or biochar manufacture are better options.
6. During this project, new evidence from other research emerged to demonstrate that ensiling seaweed would not provide the hypothesised nutritional advantages if used as livestock fodder.

Industry impact

There are poor prospects of any species of farmed seaweed providing affordable livestock fodder, given likely price points for production and competing markets that can pay more for seaweed. While there has been much ambition to produce a methane-suppressing feed additive or bulk feed from farmed seaweed, other methane-suppressing ingredients appear to be more cost effective in the short to medium term.

Sourcing wild-harvested seaweed and processing this to make silage does not appear to be practical for farmers, given the necessary equipment and high labour costs involved. Using wild-harvested seaweed as a feedstock for making compost is more practicable, while collection for commercial (off-farm) production of biochar is another possibility.

Regulatory obstacles to wild harvesting of seaweed are likely to limit its availability for these uses. However, there are increasing quantities of seaweed being deposited onto beaches or growing in river estuaries in response to aquatic pollution from urban or agricultural uses, which is ecologically and/or environmentally detrimental. Regulatory reform to enable collection of these 'nuisance' seaweeds for processing into valuable agricultural inputs is required for this opportunity to be realised.

The industry impact of this project will depend on state and territory governments changing regulations related to wild harvesting of seaweed.

Actions and next steps

No further research into ensiling seaweed is justified.

A fact sheet, *Regulatory reform for environmentally responsible management of beach wrack and estuarine seaweed growth*, has been produced as part of this project and it is recommended that this be used to raise awareness with state and territory governments about the case for reform, based on the environmental benefits from harvesting 'nuisance' seaweeds.

A fact sheet, *Practical use of seaweed as a farm input*, has been prepared as a basis for informing farmers. It is recommended that this be incorporated as an adjunct into the current AgriFutures Australia project undertaken by the Heytesbury District Landcare Network that is developing a toolkit for farmers on how to reduce greenhouse gas emissions, given the benefits of seaweed products for emissions reduction. The author of this project snapshot is a member of the team developing the toolkit.

Recommended extension activities include raising awareness of the project findings with Catchment Management Authorities and encouraging case studies of how removing seaweed in polluted estuaries and on adjacent beaches can have environmental benefits, with flow-on benefits for farmers (producing a closed loop of nutrient flows). The Curdies River catchment in south-west Victoria is a case study that has been referenced in the project documents; it would be appropriate to socialise the project findings with the Corangamite Catchment Management Authority and other stakeholders to address the significant nutrient pollution of this catchment.

Acknowledgements

The research team acknowledges the assistance of Deakin University and Warrnambool City Council in assisting with access to seaweed beach wrack as feedstock, and the assistance of Simon Schulz in making his farm available for silage-making trials.

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September 2023

AgriFutures Australia publication no. 24-016
AgriFutures Australia project no. PRO-015758

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