Regenerative Agriculture Program mixed species demonstration case study: Terry Young, Ungarra district

A mixed species pasture provides erosion control, soil water retention and improvements with regards to soil temperature, both cooler in summer and warmer in winter.

Background

Location of Terry's farm near Ungarra, Eyre Peninsula, South Australia

Terry Young is a mixed farmer of 500 hectares of crops and pastures at Ungarra and 300 hectares of leased grazing land at Big Swamp.

Soil types: siliceous sand over clay and water repellent deeper sands

Average rainfall: 375 mm annual, 285 mm growing season

Livestock enterprise: 1000 self-replacing merino ewes

Terry accessed a Regenerative Agriculture Program small grant for a mixed species demonstration site from the Eyre Peninsula Landscape Board in 2020.

Terry has always been interested in soils.

His farm naturally has water repellent sands, with the associated issues of crop establishment and soil cover.

Throughout the 1990s and 2000s, Terry undertook clay spreading and delving on his siliceous sands and was a pioneer for this practice in his district, as well as integrating the use of lucerne. This helped on a lot of land, but also left many questions and issues unanswered.

Generally, he started to see a decline in response to inorganic N, and wasn't getting on top of his weeds, particularly ryegrass, along with wanting to increase his soil organic carbon.

Of particular concern to Terry was:

- Never getting on top of weeds.
- High nitrogen fertiliser application rates leading to a decline in organic carbon in his farmland in certain circumstances (and yet acknowledging that it can be useful as well).
- Comparing his system to his remnant vegetation which he felt with biodiversity was in better shape.
- Improving grazing management, how to use feed reserves, and using rotational grazing to manipulate the pasture mix and performance.

Tillage radish with long root system

He would also like to know his grazing plan 3-4 weeks out. He has been using a lot of hay to fill the feed gaps he does have. He would like to be moving stock more regularly, to be able to observe his pastures and to adjust his management accordingly.

How he started thinking about regenerative agriculture

While travelling in Europe in 2016, Terry ended up having a chance encounter with a Professor of Soil Science at Bonn University, and it was this conversation which started to inspire Terry to try and increase the diversity in his pastures, and to look a bit more into the benefits of multi-species pastures.

He was very impressed with the evenness of growth of his first multi-species pasture, yet noticed different species also 'claimed' different soil/location niches in the landscape.

Diversity and groundcover

The importance of groundcover has increasingly been a priority for Terry, and he tries to have a no compromise approach.

Terry used his mixed species demonstration trial grant to set up a paired paddock approach with his neighbour to look at the variations from management as well as species.

During the trial, Terry has tried teff, forage sorghum, sunflowers, buckwheat, Italian ryegrass, various forage brassicas, lupins and woolly pod vetch. In the first year of trying mixed species, the forage brassicas got wiped out with aphids, but was better in the second year.

Terry has increased using rye in his mixed pastures, because it provides good early feed, and also provides robust cover in the later stages which he finds very valuable.

He has also played around with canola/vetch grain inter-cropping, with some success, but it can be hard to get the right plant densities.

Table 1: Terry's winter species mixes in 2020 and 2021.

Summer 2020 species	Sowing rate (kg/ha)	Winter species 2021	Sowing rate (kg/ha)
Sunflower	0.5	Ryegrass and Woolly-pod vetch	Naturalised seedbank
Sorghum	1	Cereal rye	15
Corn	2	Saia oats	15
Quinoa	0.5	*Previously triticale, Moby barley, and Italian ryegrass for similar roles to rye and Saia oats.*	
Linseed	0.5	Tillage radish	0.7
Lablab	1	Kale	0.7
Buckwheat	0.8	Turnip	0.7
Cowpea	0.5	Arrowleaf clover *(previously used Cavalier medic and Frontier clover)*	1
Teff	0.5	Sunflower	Trace
Safflower	0.8	Buckwheat	Trace
Millet	0.7		
Lucerne	8		

Benefits from the mixed species demonstration trial:

- Erosion control.
- Soil water retention.
- Improvements to soil temperature, both cooler in summer and warmer in winter, which has benefits in regard to nutrient cycling and biological activity.

Things that haven't worked:

Summer species establishment. While trying it a number of times, Terry says it has generally been disappointing.

"It has been a lot of work, with not a lot of joy," says Terry.

Future considerations to work on:

- Grazing management, with more rotational grazing.
- Tissue testing on the weeds as well as crops.
- Plant sap analysis.
- Using liquid calcium products.
- Understanding what the weeds are trying to tell us *"Are we treating the symptoms or the causes?"*.

Terry has appreciated working with the EP Landscape Board on the small grant program, and having the opportunity to hear about and see what others are doing.

Acknowledgements

Thanks to Terry Young for sharing his story.

This Regenerative Agriculture Project is delivered by AIR EP and is supported by the Eyre Peninsula Landscape Board, through funding from the Australian Government's National Landcare Program.

More information

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