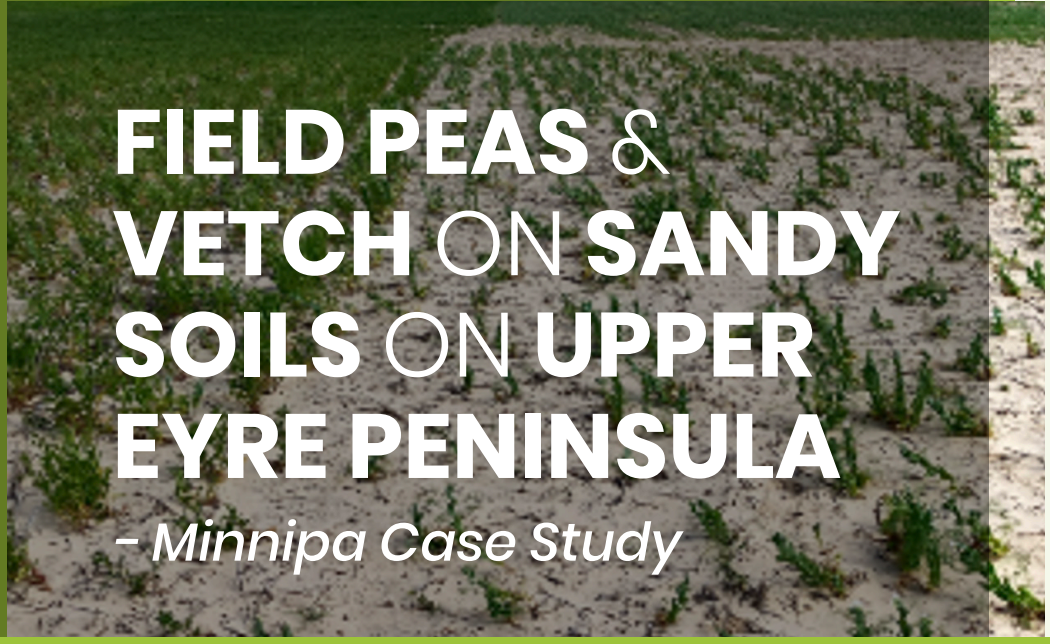

FIELD PEAS & VETCH ON SANDY SOILS ON UPPER EYRE PENINSULA

- Minnipa Case Study

AIR EP
Ag Innovation & Research
Eyre Peninsula

THE PROJECT

This project "Break Crop Suitability Across Landscapes: Stage 2" was funded by the SA Drought Hub. A multi-regional approach was led by Upper North Farming Systems (UNFS) and undertaken in partnership with Agricultural Innovation and Research Eyre Peninsula (AIR EP). Case studies spanning three farming groups and four node regions were delivered in 2024-2025.

BACKGROUND

Managing break crops has long been a balancing act for growers on the Eyre Peninsula. Break crop options offer significant benefits (e.g. price potential, nitrogen fixation, cereal disease reduction, fertility and grass weed control), but success is highly dependent on seasonal conditions and landscape variability. Other risks include limited end-use markets, fragile stubble and reduced ground cover. In low rainfall and variable environments, this makes break crop selection and subsequent management complex.

Pulses are a favoured break crop on EP as they fix nitrogen, support cereal rotations and improve profitability. Among the pulse types grown on Upper EP are field peas and vetch (often with value for hay).

AIMS:

To assess the potential of pulse break crops for providing early ground cover and summer protection on sand and loamy sand soils. This will also highlight the potential benefits and risks of incorporating break crops across a range of soil types and growing environments.

KEY FINDINGS AT MINNIPA:

- Vetch provided stronger and more reliable ground cover than field peas on the sandy soils, particularly where the aim was biomass rather than grain production.
- Both field peas and vetch struggled on the poorest white sands, suggesting that these areas may need further amelioration or alternative crop options to maintain cover.
- The Minnipa demonstration showed that vetch is better suited than field peas for maintaining cover on sandy soils in this system, although the poorest sandhill areas will still require additional management to improve crop growth and protect the soil.

MAIN CASE STUDY

GROWER:
Matt Cook

AREA:
Minnipa, Upper Eyre Peninsula

AVERAGE RAINFALL:
285 mm annual; 242 mm growing season

CROP ROTATION:
Break crop phase, for paddock cover before canola next season.

THE COOK ENTERPRISE:
This property is prone to wind erosion because of the white sandy soils. Very little grows well in these non-wetting sands, even with amelioration, so the main challenge is maintaining ground cover, particularly with legume crops, in these situations. It is also important to keep brome grass and other weeds out of the sandy patches.

Historically, the area has been medic-based, which has provided good ground cover and contributed useful nitrogen. However, Matt is moving out of sheep and he recognises the need for a break crop that can deliver both the weed control and the nitrogen input required in these areas. A key objective is to support canola crops following legume breaks. Matt has already tried field peas, with limited success, and is not yet set up for lentils, so vetch is the next best option for weed control and managing those sandy soils.

Grower: Matt Cook

WHAT WAS DONE:

A field pea and vetch demonstration was sown on 31 March 2025 on sandy soil. The demonstration included two strips of Butler field peas and two strips of Volga vetch on a very sandy area made up of white sandhills, some red flats, and patches of stone.

For each pulse type, NDVI and dry matter measurements were taken at two sites - on a loamy sand red flat (Point A) and on a sand (Point B). The goal was to produce as much biomass as possible and achieve good ground cover across the growing season and subsequent summer period. For this reason, the crop was sprayed out prior to seed set. Economic analysis based on potential hay production was undertaken by Pinion Advisory.


Vetch on the left vs field pea on the right in the sandiest areas at the Minnipa break crop demonstration, 15 September 2025.

OBSERVATIONS AND DISCUSSION:

Visually, across all soil types vetch established better and showed stronger growth than field peas. NDVI readings in August were higher for vetch than for peas, especially on the loamier soils (Table 1). Peas struggled, particularly on the sandy rises (Table 1). Biomass data backed up the vetch performing better across both soil types, however both crop types had significantly lower average biomass on the sandy and sandy loam soils (Table 1).

Matt has tried field peas three times in this country and they have performed poorly each time, so he is adamant that he will not grow peas there again and the results from this demonstration support his decision. Now his focus is on maximising the cover provided by vetch, which is also valued for the nitrogen it can contribute to subsequent crops such as canola. As even vetch struggles on some of the white sands, Matt is considering lupins under-sown with vetch, to help achieve better surface cover on these very sandy areas. Lupins with vetch would provide good stubble shelter for the canola he plans to sow in the year following the pulse phase.

Table 1. *Key soil test parameters, biomass production and final dry matter at Minnipa in 2025.*

Pre-sowing	**Point A Red flat**		**Point B Sand**	
Soil Texture	Loamy Sand		Sand	
Nitrogen (mg/kg) (up to 90cm)	28.8		15.8	
pH (CaCl)	6.1		6.1	
Organic Carbon (%)	0.71		0.38	
Colwell Phosphorus (mg/kg)	27		26	
In Season	***Field Pea***	***Vetch***	***Field Pea***	***Vetch***
NDVI (July 2025)	0.12	0.14	0.19	0.25
NDVI (August 2025)	0.14	0.23	0.26	0.28
NDVI (September 2025)	0.14	0.18	0.55	0.64
Plants (m^2)	20	52	22	45
Biomass at flowering				
Dry Matter (t/ha)	0.72	1.29	0.41	0.30

THE BOTTOM LINE:

Yields were not recorded as Matt grew these break crops purely for cover, not grain, and the paddock was sprayed out. The economic analysis covered hay gross margins, which were generally poor (Table 2). Only vetch on the red flat produced a positive gross margin for hay, but this return would not be great enough to cover the high nitrogen replacement costs of hay production.

Table 2. *Hay gross margins and nitrogen replacement costs, Minnipa 2025.*

	Point A Red flat		**Point B Sand**	
	Field Pea	***Vetch***	***Field Pea***	***Vetch***
Hay gross margin				
Hay yield (t/ha)	0.72	1.29	0.41	0.30
Hay price ($/t in 2025)	$400			
Total hay income ($/ha)	$288	$516	$164	$120
Total variable costs ($/ha)	$366	$399	$348	$342
Gross margin ($/ha)	-$75	$117	-$181	-$222
Nitrogen (N) replacement costs for 2026				
Estimated N removed in hay (kg N/t)	19	13	19	13
Urea required (kg/ha)	30	36	17	8
Urea price estimate (2025) ($/t)	$795			
Total N replacement costs ($/ha)	-$24	-$29	-$13	-$7
Note: Most input records were provided for this site. Note: Assume low rainfall zone (LRZ) for SAGIT input estimations, where required to fill gaps in records.				

Source: BUILDING RESILIENCE - BREAK CROP SUITABILITY ACROSS LANDSCAPES Economic Analysis for 2024/25 and 2025/26 by Emily Chambers, Pinion Advisory

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