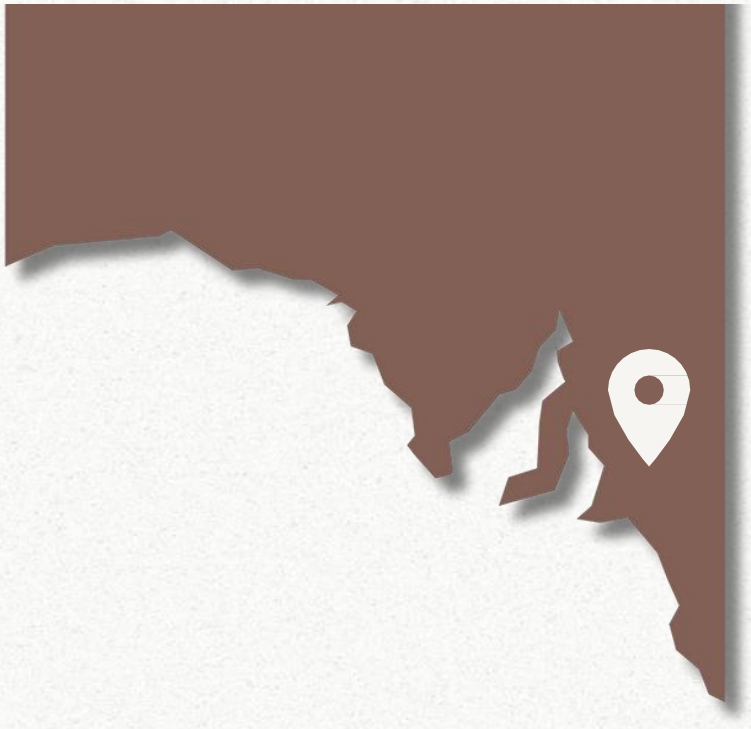
PASTURE OPTIMISATION FOR DRY TIMES

CASE STUDY #3
CHRIS TAPSCOTT

Name: Chris Tapscott
Property: Eden Valley, South Australia
Average annual rainfall: 600 mm (100 year average)
Existing pastures: Sown annually cereal rye, Persian clover and balansa clover, grazed and cut for hay.
Soil types: Acidic topsoils - loamy sand, pH 5.01 (CaCl2).
Enterprise: Mixed farming comprised of broadacre cropping of wheat, barley, oaten hay, and 600-700 head of sheep.
Trial area: 20 hectares



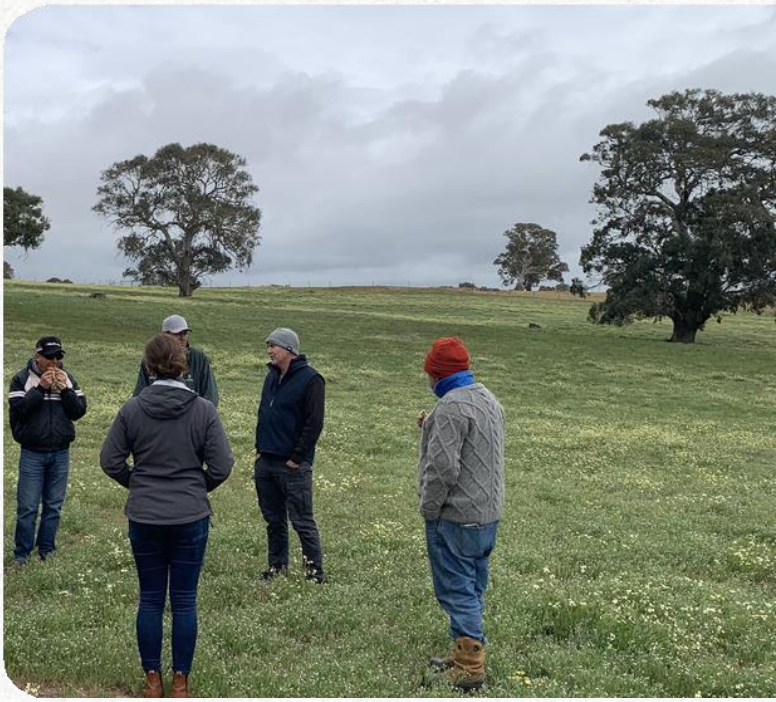


Figure 1. Barossa Improved Grazing Group members visiting Chris's serradella demonstration in spring 2023.

CURRENT FARMING PRACTICES

Chris manages a mixed farming enterprise that includes both cropping and livestock. His property spans approximately 200 hectares, a proportion of this area is leased. Average annual rainfall is 600 millimetres, however, there has been significant variation in recent years, with 2023 barely reaching 200 millimetres.

The soil on Chris' farm ranges from acidic topsoils, to dark grey to black loamy soils. Running an average of 600-700 sheep annually, a late spring lambing program in November allows Chris to optimise feed availability and utilise pastures more efficiently.

PASTURE MANAGEMENT & LIVESTOCK SYSTEMS

Chris employs a mixed approach to pasture and livestock management. He dedicates approximately 80% of his land for cropping, using the less arable portion for grazing. Chris practices rotational cropping, which helps maintain soil fertility and reduces the risk of overstocking.

One of the key strategies Chris uses is maintaining a reserve of hay, viewing it as a form of insurance against dry years. He typically keeps around 150 rolled bales of hay on each farm, which helps maintain livestock weight during periods of low feed availability.

"My dad always told me hay is like money in the bank, so we always keep a bit back for dry years", says Chris.

INTRODUCTION OF SERRADELLA

Standard practice for Chris has been to sow annual pasture for hay consisting of rye, Persian clover and balansa clover. He doesn't rely on annual pasture regeneration due to the intensity of his cropping program and to assist with weed management.

Chris was introduced to serradella through agronomist recommendations and involvement in the Adelaide University *Pasture Optimisation for Drought Solutions (PODS) project*. Serradella, specifically the Margurita and Fran2o varieties of French serradella species, were chosen for their potential to thrive in sandy and loamy soils, where traditional clovers and other pastures struggle.

In March 2023 Chris sowed 20 ha of his farm with serradella pods which performed well, despite receiving only 100 millimetres of rain for the growing season. The serradella surpassed expectations as it not only survived, but it also thrived, indicating its resilience in challenging soil conditions. Observations during the season showed that the soil began to improve in colour and structure, suggesting increased overall soil health. These changes had not been previously observed when attempting to grow traditional clovers in these soil types.

Figure 2. Nodulation on the Fran2o serradella on 4 August 2023.

MANAGEMENT PRACTICES AND OBSERVATIONS

Chris utilised a disc seeder to sow unhulled Margurita serradella pods in 2023, at a 2 mm depth with 50 kg of single super and granular inoculant. He was able achieve reasonable establishment in the lighter soils but poor establishment in the harder ground. In 2024 Chris planted Fran2o seed with a tyne machine scratching it in at around 2 mm deep, hoping to achieve more soil throw. He noted that the tyne machine, used for sowing cereals, provided better seed placement and moisture harvesting leading to improved germination rates. Chris hopes to continue using this seeding method in the future.

Grazing management also played a crucial role in the success of serradella. Chris allowed grazing on the serradella paddocks once the plants were established, which helped manage weed competition and encouraged plant growth and vigour. To complement weed control provided by the sheep, an application of clethodim was applied in July to control the grass weeds. Grazing first occurred 6 weeks after sowing and supported 160 sheep for a week. The sheep then re- entered this paddock on the 12 June and grazed for 14 days. The resilient nature of serradella allowed it to recover after grazing, making it a valuable addition to his pasture system. From the biomass cuts that were conducted in 2023 we were able to measure dry matter biomass yield of 2.4 t/ha and a pod yield of 548 kg/ha.

As serradella is a legume it has the potential to nodulate and fix nitrogen in the soil. Due too Chris previously growing lupins in the demonstration area, there was already rhizobia in the soil as lupins and serradella share the same group G rhizobia. There were no nodulation problems observed on Chris' property. It is estimated that during serradella peak flowering, Chris's paddock averaged 44 kg/ha of nitrogen fixed by the serradella (range 29-74 kg/ha).

CHALLENGES AND ADAPTATIONS

One of the primary challenges Chris faced was controlling wild radish in serradella paddocks. He explored various herbicide options and carefully monitored application impacts on serradella seed viability. There are currently limited chemical options registered for both pre-emergent and post-emergent weed control in serradella. His approach included using pre-emergent herbicides while ensuring they did not affect the re-seeding potential of serradella.

Running a relatively high stocking rate and intensive cropping system, Chris believes that this helps keep the paddocks fresh with feed available for lambing in November and provides flexibility in moving livestock onto stubble paddocks once harvest has finished.

OUTLOOK

Chris plans to continue integrating serradella into his cropping and livestock rotation. He aims to establish a sustainable cycle where serradella improves soil health, supports livestock, and provides a reliable feed source. By monitoring the performance of serradella over multiple years, Chris hopes to refine his management practices and share his insights with neighbouring farmers and agricultural groups.

Chris' experience highlights the potential benefits of introducing serradella into mixed farming systems. By addressing soil health, optimizing pasture management, and preparing for variable rainfall patterns, serradella offers a resilient and productive option for farmers facing similar challenges. This case study underscores the importance of adaptive management and continuous learning in achieving sustainable agricultural practices.

RESOURCES

GRDC - Resilient pastures for low rainfall mixed farms - crop and system benefits provided by legumes

WA DPIRD - French Serradella - use and management

Figure 3. Flowering serradella, photo taken October 2023.

ACKNOWLEDGEMENTS

This project is being led by the University of Adelaide and has been funded through the Australian Government's Future Drought Fund, and is supported by the SA Drought Resilience and Adoption Hub. Project delivery partners are Agricultural Innovation & Research Eyre Peninsula (AIR EP), Barossa Improved Grazing Group (BIGG), Lowbank Agricultural Bureau.