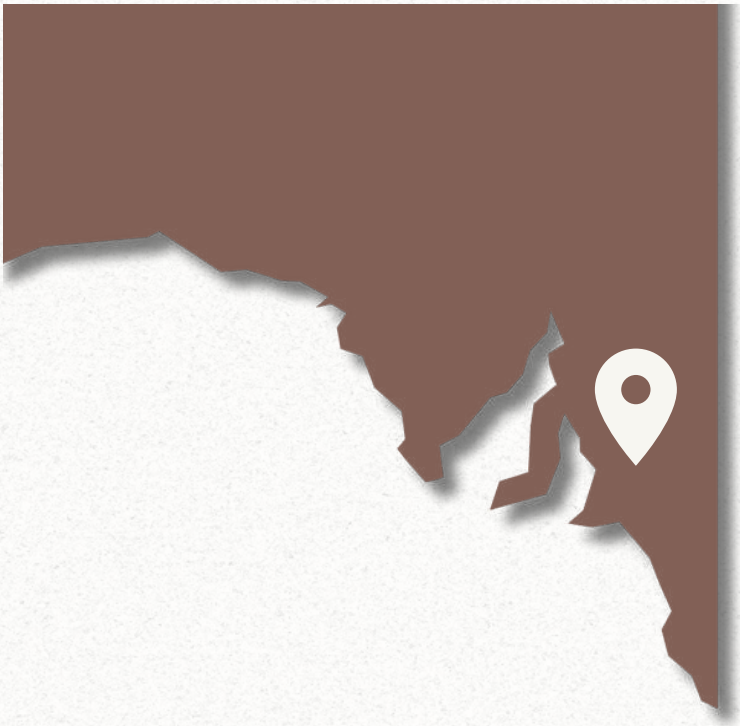
PASTURE OPTIMISATION FOR DRY TIMES

CASE STUDY #3 CHRIS TAPSCOTT

Name: Chris Tapscott
Property: Eden Valley, South Australia
Average annual rainfall: 600 mm
Existing pastures: Annually sown cereal rye, Persian and balansa clovers, grazed and cut for hay
Soil types: Acidic topsoils - loamy sand, pH 5.01 ($CaCl_2$)
Enterprise: Mixed farming enterprise comprising of broadacre cropping and sheep
Trial area: 20 hectares



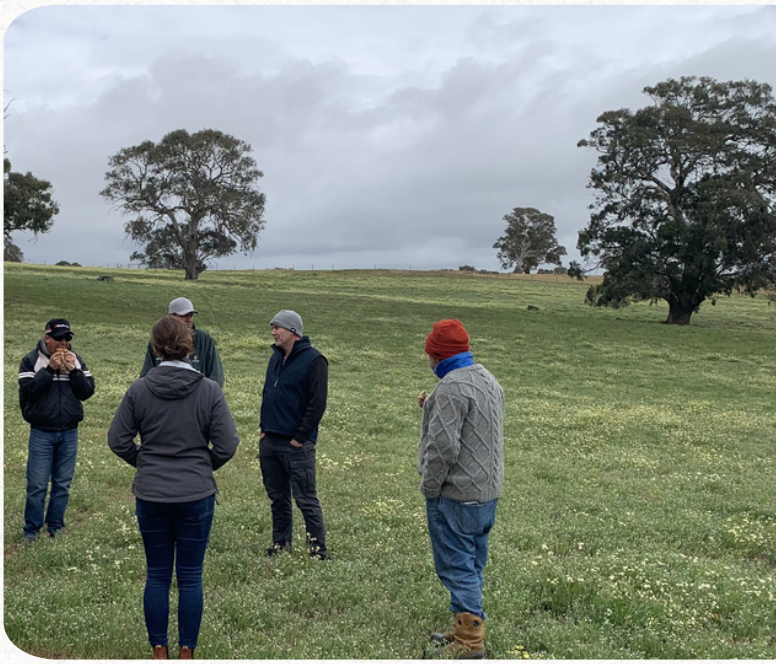


Figure 1. Barossa Improved Grazing Group members visiting Chris's serradella demonstration in spring 2023.

CURRENT FARMING PRACTICES

Chris manages a mixed farming enterprise in the Eden Valley, South Australia. His property spans approximately 200 hectares, a proportion of which is leased. Average annual rainfall is 600 millimetres, however there has been significant variation in recent years with 2023 barely receiving 200 mim in total.

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 dedicates approximately 80% of his land to cropping, utilising the less arable hectares 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 seasons. He typically keeps approximately 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 production, consisting of rye, Persian and balansa clovers. 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 which performed well, despite receiving only 100 mm of rain for the growing season. The serradella surpassed expectations, as it not only survived, but it also thrived, indicating its resilience in challenging conditions. Observations during the season showed improved soil structure, suggesting that Chris is on his way to increasing overall soil health. These changes had not been previously observed when attempting to grow traditional clovers in these soil types.

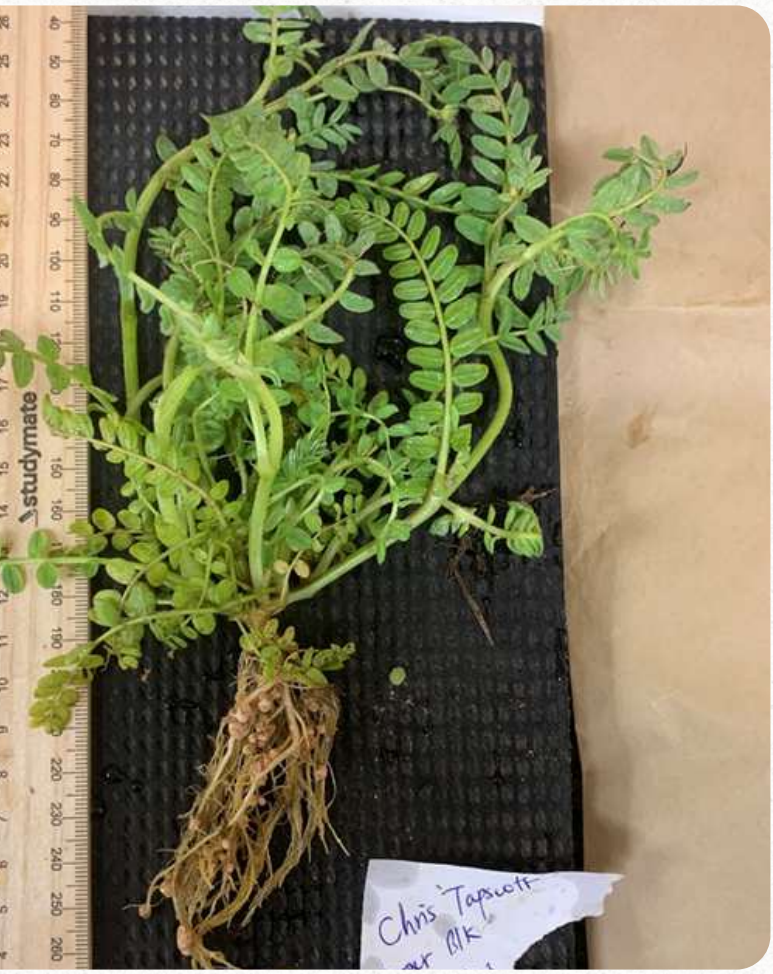


Figure 2. Nodulation on the Fran2o serradella on 4 August 2023.

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 to 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 a depth of approximately 2 mm, hoping to increase soil throw. He noted that the tyne machine, typically 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 critical role in successful establishment 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 post sowing, supporting 160 sheep for one week. The sheep then re-entered this paddock on 12 June, grazing 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, researchers 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 to 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's property. It is estimated that during serradella peak flowering, Chris' 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, ensuring they did not affect the reseeding potential of serradella.

Running a relatively high stocking rate and intensive cropping system, Chris believes this helps keep the paddocks fresh, with good feed available for lambing in November. In addition, it 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, and supports livestock in providing 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

AIR EP - Pastures Optimisation for Drought

AWI 10 minute talks

Making more from sheep

South Australian Drought Hub

Figure 3. Flowering serradella, photo taken October 2023.

ACKNOWLEDGEMENTS

Thanks to all the farmers who hosted demonstrations and trials as part of the "*Promoting best-practice feedbase management to deliver improved drought resilience in low to medium rainfall regions through on-farm demonstrations and case studies*" project. This project was led by the University of Adelaide and has been funded through the Australian Government's Future Drought Fund, and 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, South Australian Research & Development Institute (SARDI) and the Sheep Industry Fund.