



Sophie Hanna, Chantelle and Christine Gorman at the Savernake demonstration site.

CHANGING LANDSCAPES THROUGH DROUGHT RESILIENT PASTURES

RIVERINE PLAINS DEMONSTRATION SITE CASE STUDIES

INTRODUCTION

Creating Landscape-scale Change through Drought Resilient Pasture Systems, otherwise known as *FDF Resilient Pastures* is a project funded by the Future Drought Fund's Drought Resilient Soils and Landscapes Grants Program and has a project period of June 2022 - June 2024. The project is led by Holbrook Landcare Network and partners include Central West farming Systems, Monaro Farming Systems, Riverine Plains, FarmLink, Local Land Services, NSW DPI, CSU and The Southern NSW Resilience, Adoption and Innovation Hub.

The project supports pasture demonstration sites across central and southern NSW to showcase modern pasture species combination and management practices known to build greater resilience to their landscape. Farmer workshops, publications, case studies and conducting on-farm consultations with farmers have supported delivering extension messages from the project.

BACKGROUND

As part of this project, Riverine Plains established two perennial pasture demonstration sites during May 2023 at Savernake and Barooga (NSW). The Savernake site was hosted by Chantelle and Christine Gorman, while the Barooga site was hosted by John and Sarah Bruce. Details about the demonstration sites, as well as results, are published in *Research for the Riverine Plains, 2024*, and are also available at www.riverineplains.org.au.

CHANTELLE AND CHRISTINE GORMAN

Savernake, NSW.

Farming enterprise

- Approximately 2830 hectares (ha)
- Mixed farming, with a 50/50 split between livestock and cropping
- Running beef cattle, merino sheep and first cross ewes for prime lamb production
- Cropping 1010 – 1200 hectares annually of canola, lupins, oats, wheat and barley, as well as grazing wheat and barley for ewes and lambs
- Irrigation – running two centre-pivots, sourcing water from a private irrigation scheme, with one centre pivot established during the 2018 drought.

What proportion of your land do you grow annual and perennial pastures, and has this changed over time?

In the last five years we have increased our pasture to around 30 percent between both properties and could potentially increase this further.

However, you also have to work in with your crop rotations. So, if you are pulling a paddock out of grain production to put pasture in, you have to balance how much grain you're producing with the quantity of mouths (livestock) you have to feed.

Which pasture species do you grow and why?

We grow lucerne SARDI 7s2 and SARDI Grazer, with Mintaro and Monti sub clovers. The SARDI 7s2 and SARDI Grazer are both winter active lucerne cultivars that seem to complement each other well, as the SARDI Grazer has a higher grazing tolerance due to its lower crown. Mintaro is a mid-maturing *Brachycalycinum* sub clover cultivar and Monti is an early-mid-maturing *Yanninicum* sub clover.

For the demonstration paddock that was established during May 2023, we sowed the SARDI 7s2 at 5 kg/ha with 3 kg/ha of Mintaro and 3 kg/ha Monti. To compare a different sowing rate and the SARDI Grazer, we sowed a strip with a higher SARDI 7s2 seeding rate at 9 kg/ha with the same quantity of clover, and a second strip containing a combination of SARDI 7s2 and SARDI Grazer at a total of 5 kg/ha with the same quantity of clover, in the middle of the paddock.

Lucerne works well during spring and summer, while it is less active in winter, which is when the clovers bridge the gap by providing good feed during the winter months. Providing a year-round feed supply is important, but of course the quantity depends on the weather conditions during the season.

Why do you consider perennial pastures an important part of your system?

Perennials allow us to have more feed over the summer months, when there isn't much other feed around.

Getting our management strategies in place and establishing an increased number of high-quality grazing paddocks, like at our demonstration site, will hopefully boost our production by allowing us to increase our stocking rate.

As a legume, lucerne is capable of fixing nitrogen. It can therefore increase nitrogen in the soil profile, which can be drawn on for a few years after the paddock is rotated back into cereal crop production. Down the track, we should see the nitrogen benefits of having the lucerne stand, which has the potential to boost cereal crop yields, without relying too much on synthetic nitrogen fertilisers.

Describe the way you manage pastures throughout the year and over various seasonal conditions.

We rotationally graze our perennial pasture paddocks throughout the year, ensuring they are not overgrazed.

When establishing a new pasture, it's very important to allow perennials time to take off in the first year and establish an extensive root system before being grazed too heavily. It's also really important not to graze it down too close to the crown; this can kill the plants and reduce the density of the lucerne. We want a lucerne sward to last at least five years, and if we manage it well, we can help it survive longer.

Our demonstration paddock, which was sown in May 2023, was first grazed in mid-January 2024, when we put 1200 sheep on the 58 hectare paddock for a week. The lucerne handled it well, as we grazed the more fibrous stems to just above the crowns, ensuring there was a good amount of stem and leaf remaining for strong future growth.

Adding in a straw (feed) component when lambs are grazing lucerne helps their stomachs and helps prevent bloat, so having that roughage is important when grazing lucerne and clovers. We've also found lucerne has a higher nutritional value than grazing wheat and grazing canola.

Do the pastures in your system increase your farm's overall drought resilience, and if so, how?

Yes. Having an established perennial crop helps maintain ground cover throughout the year, which helps reduce soil erosion. When we do strike those drought years, it also gives us more of an opportunity to be prepared for it, not only for erosion control, but for feed supply as well.

The plan for later in the year is to reduce the grazing to get a good cut of hay off the paddock and store it for drier times.

What were your key learnings from hosting the demonstration site on your farm?

The demonstration site provided us the opportunity to see the difference in sowing rates and cultivar selection on our own soil types and see how it fits in our operation.

The plan for the next five years is to put more pasture in, to support the higher stocking rates we aim to achieve.

The two different strips within the paddock allowed us to visualise what we can do differently, and what works and what doesn't. We've seen that if we increase our sowing rate and add the more grazing tolerant lucerne, we're able to grow more feed. It will be good to see what happens when we graze it further and how it comes back during the next couple of months.

JOHN AND SARAH BRUCE

Barooga, NSW.

Describe your farming enterprise.

- Approximately 1200 ha
- Mixed farming enterprise
- Winter cropping rotation includes wheat, canola, and barley
- Summer cropping rotation includes rice and corn
- Producing first cross lambs from Merino ewes and Border Leicester rams, lambing in April-May.

What proportion of your land do you grow annual and perennial pastures, and has this changed over time?

We've always had around half of our land sown to pasture, and about 50 percent of our winter canola and wheat crops are grazing crops.

Which pasture species do you grow and why?

We've been growing lucerne forever. I've been farming for 20 years and I've tried chicory and everything, but as far as sheep tucker goes, you can't really beat it.

For the last four to five years, we've been growing the L70 lucerne cultivar as it's one of the hardier varieties and it is relatively cheap. For the two 10 ha demonstration paddocks which we established in May 2023, we sowed 9 kg/ha of L70 lucerne with 6 kg/ha of Zulumax arrowleaf clover. This was later than usual given the wet start to the year. Adding arrowleaf clover helps bulk the feed, as it produces good quality and quantity feed through spring and into summer, typically allowing us to first graze it in August.

Why do you consider perennial pastures an important part of your system?

Having grown lucerne for the past 20 years, I've found the deep-rooted nature of lucerne allows it to have good longevity, even through a drought. A key part of why I like perennials is that they're relatively easy to manage. Having sown lucerne into the dryland paddocks, we won't need to resow anything in there for five to six years if we look after it well. I don't like to come in with a tyne machine to over-sow into a pasture, as I've found it causes too much damage. You're better off looking after it well from the beginning.

Describe the way you manage stock on your pastures throughout the year.

We have lucerne both under a centre pivot and in dryland paddocks. We have split the 40 hectare irrigated paddock into four smaller paddocks using a two-strand electric fence running east-west and a permanent fence running north-south, to allow for well-managed rotational grazing and to use them as lambing paddocks. We typically will have 500 ewes split evenly across the four paddocks under the irrigator.

In the dryland paddocks, we keep the numbers relatively low, with around seven to eight head per hectare, rotating them across the paddocks based on feed availability and to ensure the pasture isn't grazed too hard. By keeping the sheep off the paddocks when it's been dry, like during the 2024 autumn, we've been able to see it pick up well after rain. When we have quite mild autumns and good rain, like we have in the previous four years, the lucerne has grown well, providing good feed for pregnant and lactating ewes. Once we mark the lambs, they are then shifted onto the grazing crops.

Describe the way you manage your pastures agronomically.

We sow most of our lucerne with an air seeder with 25.4cm spacings at 8-10 kg/ha in the dryland paddocks. For the irrigated paddocks, we'll speed-till the soil then sow it with a spreader due to the targeted heavier sowing rate (20-25 kg/ha), which we use because much higher plant densities can persist with greater soil moisture under irrigation.

We've found that some of our best lucerne establishment results come when we sow it after a barley or wheat crop, and by sowing it on its own and during early April, not August. It's generally the first thing we sow, and we typically add 200 kg/ha single super and 80-100 kg/ha potash. We cut lucerne hay off the irrigated paddocks, and if we have a good spring, we'll cut a bit of hay off the dryland paddocks as well.

We do manage the dryland and irrigated lucerne quite differently, because the irrigated is a lot more intensive and we are pulling a lot more off it. In the dryland paddocks, we don't generally do too much spray topping. We instead try to counteract that with fertiliser, keeping it clean, so if we want to make hay, it's good-quality hay.



Do the pastures in your system increase your farm's overall drought resilience, and if so, how?

Given the lucerne grows well over summer, we use the lucerne paddocks to set ourselves up well for lambing in April-May. Having a good quantity of high-quality fresh feed is valuable over the summer as it saves us from trail feeding in a good season.

In 2018-19 when it was quite dry, we established a containment feeding area to enable us to get stock off the paddocks to prevent the pastures from being over grazed. Back in the millennial drought we were grazing the country pretty hard, but since having a containment area, we've found we can better support the lucerne after 10-15mm of rain, by keeping the stock off it initially, which helps it get going. If we were to graze it straight away, we'd be forcing it to continue drawing energy reserves from its roots, which can reduce plant density over time. Once receiving a bit of moisture, lucerne can provide a good feed source relatively quickly, compared to an annual which would need sowing, then time to establish.

Having the grazing crops also allows us to give our pastures a rest. We can mark the lambs, then put them onto the grazing crops. Depending on what the weather does, for example if it's still

looking dry and the grazing area has been eaten, we can wean early and feed the ewes into the containment area to get them off the pastures. This way we can keep the ground cover in the paddocks.

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This case study, which was first published in June 2024 by Riverine Plains, is one in a series developed through the *Creating landscape-scale change through drought resilient pastures* project.