



Farming with Nature

Summer cover cropping

Farmer Profile

Name: Peter and Wendy, Casey and Amanda Bradshaw

Location: Tambellup

Average Annual Rainfall:
450mm

Enterprise mix: Livestock (sheep and cattle) and cropping (barley, oats, canola)

Property size: 1,200 hectares

Soil type: Sand/loam/gravel duplex, granite and dolerite loam

Summer cover cropping has multiple benefits including:

- Providing strategic grazing of green feed in summer whilst enhancing soil biological activity.
- Helping to keep the topsoil cool in summer if managed to maximise ground cover.
- Helping to build organic matter and increase soil carbon.
- Providing habitat for beneficial insects when diverse crop species are grown.
- Rejuvenates unproductive paddocks potentially increasing carrying capacity of pasture in following years.

Biological farming systems

For Peter and Wendy, it was an inevitable decision to try summer cover cropping as part of their holistic management style of farming. Peter had always dreamt of having a self-rejuvenating farming system and a more natural way to farm. Wendy was always interested in farming



with nature, wanting to link as much as possible with nature to be more productive. When they found summer cover cropping had the potential to help their soil rejuvenate and be more productive, they were motivated to make it work.

Summer cover cropping can provide increased ground cover through summer and help reduce risk of soil erosion, buffer soil acidification, improve soil health, and provide summer feed.

The Bradshaw's aimed to have a diversity of plants to help stimulate the soil biology all year around. They believed summer cover cropping would maintain the biological activity in the soil and increase the soil microbial diversity to ultimately improve soil health. Apart from stimulating soil biology, they found further benefits in improving grazing productivity.

Peter said "We put lambs in there a number of times and they loved it. They even tried to squeeze through a gap in the gate to get to the beautiful green paddock. This green summer cover cropping has so many benefits, especially for the young sheep."

However, their journey, which began in 2013 has not been smooth. The first year they trialed a summer cover crop on 80ha, it was not successful. They hired a local farmer with a disc seeder to seed a

mixture of species in December after the canola was harvested. However there was very little rain that summer and there was no sign of germination. They later realized the triazine herbicides that had been sprayed on the paddock when growing canola may have had a residual negative affect on germinating seeds later in the season.

After a year's break and talking to other farmers they decided to try again, this time with success. They sprayed out the pasture at the beginning of September to conserve soil moisture. They then seeded at the end of September when the soil temperature was warm enough to trigger germination.

The initial failure on 80ha was a good learning experience. They were better able to understand the importance of maximizing the chance of good establishment by better utilizing winter moisture and to trial on a small scale first. It made more sense to try a smaller paddock to reduce the risk of initial investment loss. For the following three years the Bradshaw's planted summer crops in 20ha paddocks. They are now also targeting paddocks that are lower in the landscape and prone to waterlogging in the winter.

"Since we've been able to better understand how to successfully grow a summer crop, we estimate we have tripled the sheep grazing carrying capacity on summer cover cropping paddocks for at least the

"We just love working with nature, to be as productive as possible and to keep on trying to make a really vibrant and healthy landscape"



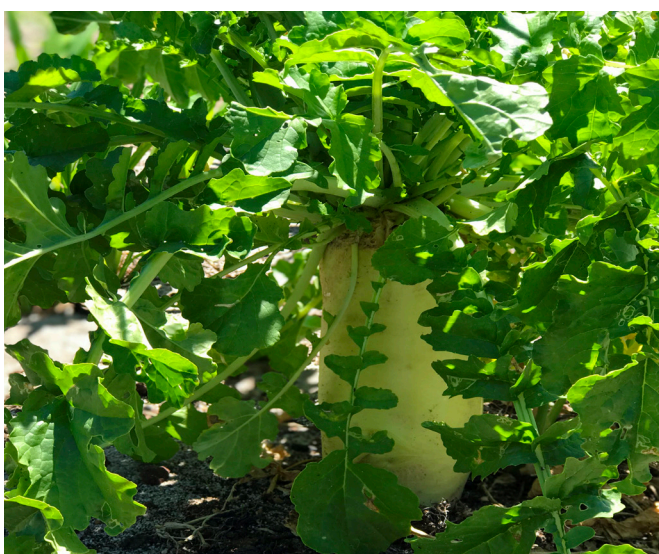
following season. It was a very poor quality pasture before, even on a gravelly hill, but summer cover cropping seems to stimulate the soil well and it is very good pasture now” Wendy said.

Summer crop species

The Bradshaw’s use several combinations of seed mix year to year with millets, tillage radish and sunflowers as key components. These plants have extensive root systems which can prevent soil erosion, soil compaction and build soil carbon which is the main energy source for soil microbes. Other species the Bradshaw’s have trailed include lablab, cow peas and vetch.

Radishes

Recent research has revealed that radish has beneficial effects on soil properties and therefore has great potential in cover cropping (Gruver et al., 2017). The radishes that the Bradshaw’s have been using are tillage radish, large rooted selections of daikon-type radishes traditionally used in Asian cooking. These radish roots can aerate soil with their deep roots which can penetrate compacted soil (Chen and Weil, 2010). After the fresh radish dries out, the hole created by these roots tends to remain



open and improve drainage and air movement in the soil. These radishes are also highly palatable to stock who tend to eat them to the ground.

Millets

Millets are summer fodder crop which are grown for various reasons. Millets are fast growing and have an extensive root system which reduces erosion and can aid water infiltration and retention (Price and Caster, 2007).

The Bradshaw’s have used a range of millet varieties, which are a temperate grass that tolerates relatively cool soil temperatures for germination.

Millet stubbles or failed crops can also be safely eaten by stock, as they do not contain the toxin prussic acid found in sorghum (Hills and Penny, 2005).

Sunflowers

Sunflowers have a strong taproot which can extract water from 2 to 3m below the surface and can scavenge any moisture or nutrients that have leached below their roots (Hills and Penny, 2005; Moore et al., 2014).

The Bradshaw’s were excited to find a few birds and some predatory insects around the sunflowers. They are keen to keep observing them recognising their pivotal role in providing ecosystem services such as pollination and biological pest management.

Transitioning to a biological farming system

“Even if you hear of other success stories, we have learnt that it is wise to trial big changes on a small scale to start with because every farm has different management regimes, and soil constraints. Obviously our soil was not ready for change on such a big scale. We realised we had not understood our

soil well enough.” Wendy said. The Bradshaw’s learnt it takes time to gradually transition to biological farming and summer cover cropping is just part of the process. The soil needs all the right components to create the ideal environment for microbes and most importantly time for them to establish. For example, synthetic nitrogen needs to be gradually reduced to create the optimal environment where free-living nitrogen fixing bacteria can thrive and increase in number.

In addition, they realised economies of scale were critical. They found the cost of input and yield ratio they had observed on others’ farms might not work for their farm to make the same profit.

They were encouraged by the lessons they had learnt over the five years, including constraints to production on their farm and how to deal with these.



The Bradshaw’s are keen to continue their learning journey and build on their success. They are planning to expand summer cropping areas and trial different combinations of seed mix. They have gained confidence and plan to target paddocks where they need to rejuvenate pasture and are also considering introducing perennials into the mix.

References

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Produced by:

Letisha Newman, Regional Agriculture Landcare Facilitator, South Coast NRM

All photos provided by Kanako Tomita, Project Officer, South Coast NRM

South Coast Natural Resource Management Inc.

88 Stead Road, Albany WA

(08) 9845 8537

Info@southcoastnrm.com.au

www.southcoastnrm.com.au

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