

Does mixed cover cropping in winter have a place in the low rainfall Mallee?

Firstly, what is mixed cover cropping?

Secondly, what are the potential benefits to my farm?

Thirdly, how would mixed cover cropping work in my Mallee farming system?

WHAT IS MIXED COVER CROPPING?

Diversity. One of the great drivers of successful farming in the Mallee is diversity – a rotation with a range different crops; where each crop brings some strength -something different to the game. We have come a long way from just growing wheat year in year out, because as we have seen in a monoculture yields go down as disease and pests come in. Diversity of crops brings new vigour, refreshes the soil, controls root disease, allows different grass control options, nitrogen fixation in the case of legumes, different root systems and importantly different soil microorganisms.

So what is it? Cover cropping is the 'a crop in between cash crops for the protection and improvement of the soil'. Mixed cover cropping is the planting of a crop of diverse species between cash crops for the same reasons. In a Mallee context a mixed cover crop can take the place of a chemical fallow or even a break crop. A mixed cover crop is so much more than simply Oats and Vetch together; we suggest that you might want to think bigger than just mixing two species– there are mixed cover croppers planting mixtures of up to 25 species.



Sown mixed cover crop, Lameroo 2019. A mix of five different winter species.

WHAT ARE THE POTENTIAL BENEFITS OF MIXED COVER CROPPING?

There are many wonderful claims from proponents of mixed cover cropping to soil health and production. Some of the potential benefits of cover cropping are:

- Build soil life (microorganisms) and fertility and organic carbon
- Suppress weeds
- Reduce erosion
- Cut fertiliser use and costs
- Cut herbicide and insecticide use and costs
- Improve yields of money making sown the next season
- Increase soil carbon and organic matter levels
- Decrease nutrient loss to leaching
- Prevent soil moisture loss through increased (even complete) ground cover



Mixed species dry matter bulk in August 2019, Lameroo

All Mallee growers would want to see all or at least some of these things for their paddocks and farm. There is more work to be done to identify these benefits out for the Mallee.

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Engine room. Microorganisms are the engine room of the soil and therefore any farming system. There are billions of a very wide range of soil ‘bugs’ in each tablespoon of soil. Some are pathogens (rhizoctonia) and many are beneficial (rhizobia), and they all contribute. Every time we disturb the soil we reduce and change the mix of these bugs in the soil. Each crop we grow changes the mix as they foster some bugs and inhibit others. Really, we are only now finding and identifying out how many different types of microorganisms there are in our soils – let alone what they do.

Like a natural environment. A mixed species crop is what we see in a natural landscape – a wide range of plants with different root systems and canopies, different soil type preferences all feeding and fostering a diversity of microorganisms. Rarely do you see in a natural environment a single plant species dominating a landscape for years on end.

Organic carbon. We need to stop the decline in organic carbon. The organic carbon is a measure of the fertility of a soil. The organic carbon fraction of a soil is a reserve of mineral nutrients that as the mineralisation happens the organic carbon component releases and can later store plant nutrients. Our Mallee soils have decreased in organic carbon and, despite our best efforts with no till farming techniques, are still dropping and certainly are not growing. Some of the sandhills are almost pure sand; much like a hydroponic system where we must supply all the nutrients for plant growth. Organic carbon drops with tillage and erosion and builds very very slowly; think decades rather than yearly changes.

Mixed cover cropping has the real potential to arrest some of this decline.

HOW CAN I MAKE MIXED COVER CROPPING WORK ON MY PADDOCKS?

There is a lot we still need to find about the benefits of a mixed cover cropping system in a Mallee environment. We can start with a farm rotation as per normal with the mixed cover crop replacing a chemical fallow. The winter crop can be terminated in the same way as a fallow with subsequent savings of moisture and nitrogen. The benefits potentially flow in the following seasons with improved crop health and yield.

The longer a mixed cropping system is used in rotation the better we hope to see the health and structure of the soil improving as we foster and promote the diversity of our system

LIVESTOCK BENEFITS?

A cover crop with diversity offers another level of benefits for growers running livestock. Variety in crop species in feed crops offers a more balanced diet to stock through a better balance of nutrients. Cover-cropping farmers reported stock ‘self-medicating’ by selecting specific plants from within a cover crop; eating what they need for health rather eating what’s on offer. There are many reports of improved stock health grazing on diverse cover crops. We are all told to eat a wide range of foods and livestock are not that different – they will perform better with a diverse diet; with a wide range of plant species.

Mixed cover crops can be sown early with little impact on the normal cropping program – thus also providing early feed or filling in an autumn feed gap.



Eliza Rieger, NRM, showing the different root and soil effects at Lameroo 2019.

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Grazing. Cover crops can be grazed, so long as the species included in the mix are safe for stock. There are two general rules for grazing cover crops:

1. Crash graze - use big mobs on small areas for short periods. This applies high grazing pressure, which encourages efficient use of the cover crop, but avoids over-grazing and erosion. Strip grazing cover crops would give even greater control of grazing while improving the efficiency.
2. Allow stock to eat only a third of the biomass, with the residual cover retained for soil health.

Maximising dry matter. Most of the regenerating pastures in the Mallee have a diverse range of species – medic, wild turnip, thistles, grasses – ryegrass, barley and brome, geranium, volunteer cereals and grain legumes. A group of farmers sat down recently and counted 60+ species regularly growing as weeds in their paddocks; there is a broad range of plants already here. However, most of these plants are weeds and have very low productivity - low dry matter and mainly concerned with producing a large amount of seeds.

Sowing a mixed cover crop with highly productive species which are similar species to what we already have but with improved production will promote better utilisation of the paddock. With a much wider range of species in a mix there is better chance that the plants will find their niche soil and landscape with better overall coverage.

I think mixed cover cropping needs to find a place in the Mallee for the sake of our soil health.



Mixed cover crop vs. single species crop. Lameroo 2020

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Mallee Sustainable Farming



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