

Multi-species pasture case study

Simon Scott

Farm overview

Simon Scott operates a farm business in Barongarook West, near Colac in South-west Victoria. The farm is primarily run as a dairy farm with some beef grazing. The Scott's farm comprises 320 hectares, with about 279 hectares available for grazing the milking herd. Every year about 40 hectares is sown to multi-species annual summer crops followed by a perennial multi-species pasture in the autumn.

The soils are loam over a clay base and highly fertile. They are prone to compaction and waterlogging, especially during wet years. The climate is characterised by cooler winters and moderate summers. Whilst pasture can be grown year-round, peak growth occurs in autumn and spring with cold wet winters and hot dry summers presenting some challenges.

Between 210 and 300 cows are milked on the farm. The dairy herd is mixed breeds, mostly Jersey, Kiwi cross and New Zealand Friesians. The calving period is predominantly late February through to early May. There are about 30 heifers that calve in September/October. On average 70 replacement calves are reared every year with extra heifers purchased opportunistically.

Why shift to multi-species pastures?

Simon first became interested in regenerative agriculture to simplify the farming system. He had previously grown some summer crops, which were generally a monoculture or combination of millet and rape. The first step in their regenerative agriculture pathway was to incorporate multi-species annual crops and perennial pastures.



Over time, the mixes evolved and they now use two main mixes which include:

Perennial mix:

- chicory, plantain, lucerne, cocksfoot, ryegrass, prairie grass, phalaris, fescue, and clovers (red, white, strawberry, subterranean, arrow leaf and balansa)

Summer mix:

- sorghum, millet, sunflowers, buckwheat, turnips, rape, mung beans, soy beans, clover, arrow leaf clover, cow peas, fenugreek, and lab lab.

A longer than typical rotational grazing system is used, giving the multi-species pasture between 30 and 90 days (or sometimes even longer) to rest. To maintain pasture productivity, higher post-grazing residuals are targeted compared to when Simon was operating a conventional system. The feeding system is pasture-based. The cows are fed on a mix of home-grown pasture, a moderate amount of grain, and some bought-in organic hay to supplement when pasture is limited due to seasonal conditions.

The move from conventional to regenerative farming was followed with organic certification. Regenerative farming practices are the primary focus in the farming system, with organic principles a complementary addition. Core practices adopted include production of multi-species pasture crops, use of bio stimulator liquid worm castings in place of synthetic fertilisers, and soil testing to monitor nutrient levels. An important goal is to build soil carbon to increase moisture holding capacity and structural integrity through improved aggregation. This gives a more resilient farm that appears to withstand dry periods. Flexible milking frequencies have been used for one season and may be used more strategically going forward. Pasture renovation to replace ryegrass dominant pastures with diverse mixes and reduced production of hay and silage build flexibility into the system.

Key learnings and benefits

These changes in farming practice have simplified the farming system, generated environmental benefits, and reduced risk to the business at the same time. They have also realised the following benefits:

- Increased proportion of home-grown pasture feed and reduced reliance on purchased feed.
- Pasture consumption has been maintained between five to six tonnes of dry matter per hectare.
- Eliminated synthetic fertiliser.
- Increased the amount of carbon in the soils from 4 per cent to 7-8 per cent, and a balanced soil nutrient profile.
- Improved soil pH, soil structure, water infiltration, moisture retention and microbial diversity.
- Improved pasture quality.
- Reduced incidence of mastitis and milk fever observed.

The plan is to continue to simplify the farming system and build on the improvements generated from transitioning to regenerative and organic farming.

The numbers to back up the story

The comparison below is a comparison of the whole farm system performance prior to the adoption of multi-species pastures (2013/14 to 2018/19) and since the adoption of multi-species pastures (2020/21 to 2023/24). It should be noted that multi-species pastures are one aspect of the system change which involved less cows, and generally lower inputs, with a focus on simplification of the business and improved sustainability/biodiversity. It is not an isolated analysis of the contribution of multi-species pastures but, it does provide useful insights into the performance of the system with multi-species pastures in it.

Profit was higher in the period with multi-species pastures with a Return on Total Assets of 5.6 per cent compared to 3.1 per cent in the period before multi-species pastures were adopted. The business shifted from having a ROTA slightly below the regional average (3.1 per cent versus 3.4 per cent) in the pre-multi species period to slightly above the regional average for South-west Victoria Dairy Farm Monitor farms (5.6 per cent versus 5.2 per cent). Total milk production was lower in the multi-species period and milk income was \$143,000 lower but, the decrease in feed costs of \$247,000 outweighed this and was associated with an increase in Earnings Before Interest and Tax (\$411,000 versus \$154,000). The profit margin in terms of EBIT/kg of milk solids increased from \$0.93 in the pre multi-species period to \$4.24 in the multi-species period.

The farm system with the multi-species pastures appears less exposed to fluctuations in the supplementary feed market with lower purchased feed costs and a higher percentage of home-grown feed in the diet (75 per cent versus 63 per cent). There was not a substantial difference in pasture consumption between the two periods. Total pasture consumption per ha was slightly lower in the multi-species period (5.7 versus 6.2 t DM/ha) but the amount grazed per hectare was higher in the multi-species period with 5.7 t DM/ha grazed and none conserved and fed back versus 4.5 t DM/ha grazed plus 1.7 t DM/ha conserved and fed back in the pre multi-species period. Hence, fodder conservation costs and fertiliser costs were lower in the multi-species period which outweighed the slight increase in sowing and seed costs. This resulted in the Homegrown Feed costs decreasing from \$116/t DM to \$70/t DM in the multi-species period.



Table 1 Farm details and business efficiency

	Before multi-species 2013/14 –2018/19	After multi-species 2020/21 – 2023/24
Milking cow numbers	343	242
Milk solids (kg MS)	166,000	99,000
Earnings before interest and tax	\$154,000	\$411,000
EBIT per kg milk solids	\$0.93	\$4.24
Return on total assets managed %	3.1 (regional average 3.4%)	5.6 (regional average 5.2%)

Key points

- The inclusion of multi-species pastures has not had a detrimental impact on profit, and the period when they were included as part of the system was actually more profitable than the previous years before they were introduced.
- The multi-species pastures appear to have made an important contribution to enabling a successful shift to a farm system that is less exposed to fluctuations in purchased feed prices and nitrogen fertiliser prices.
- In summary they have reduced risk, maintained or improved profit, and increased biodiversity.

