

The annual pasture legume Margurita® French serradella provides Colin and Anna Butcher's cereal crops on their Brookton, WA farm with all the nitrogen they need. Photo: Jill Griffiths.

Growing their own nitrogen

The annual pasture legume Margurita® French serradella has changed Colin and Anna Butcher's farm and it's changed their lives as well, so it's no wonder that Anna speaks so enthusiastically about it. By Jill Griffiths

“We no longer add nitrogen to our cereal and canola crops, and we don't feed sheep,” she said. “In July last year, when most people were worrying about whether or not they needed to add extra N, Colin and I were visiting our daughter in Europe. We didn't need to worry about N because the serradella had put all the N that the cereals needed into the soil the previous year.”

What began as an idea a few years ago has developed into a passion. Anna said it took her three years to convince Colin to give serradella a go and the final decision to do so was prompted by a sustainable agriculture grant from Wheatbelt NRM.

“The grant enabled us to put in 25ha of serradella as a seed nursery,” Anna said. “That was 2012. The following year we put in 400ha of summer-sown serradella. We grew Mace wheat on the previous year's serradella and didn't add any nitrogen to it.

“We have found that crops grown after serradella have comparable yields to those grown with traditional nitrogen.”

In subsequent years the Butchers have continued to expand the area of their farm sown to Margurita® French serradella and have also incorporated the legume biserrulla into the mix.

“Traditionally sub-clover pastures and lupins formed the basis of our livestock production and crop rotations,” Anna said. “Sub-clover pastures were performing poorly as a result of drier seasons or false breaks. Lupins dropped from 25% of total crop to 6%. Issues with low profitability, poor weed control and wind erosion led to the demise of lupins as a viable legume in our system.

“We had become dependent on artificial nitrogen and needed a new option with lower risk and we found it with French serradella.”

The serradella varieties grown by the Butchers are protected under plant breeders rights, however farmers can harvest and save seed for their own use. It is readily harvested with a conventional harvester. The Butchers have done this to reduce the cost of establishing serradella on new paddocks. Anna said weed control was important

Case study

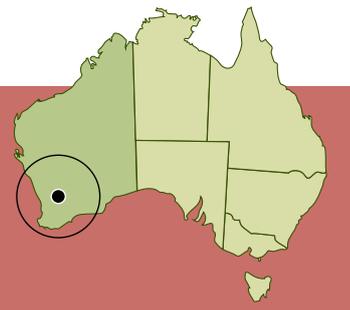
Colin and Anna Butcher, Mailrock Farm, Brookton, WA

Property: 2730 hectares

Soils: Predominantly duplex with sand over gravel clays but range from river loams to sands and gravels.

Rainfall: 400 to 450 mm

Enterprise: 1200 to 1300 ha cropped (wheat, barley, canola, oats and export hay); 3000 Dorper ewes.



when establishing a seed nursery. Seeking information during the learning phase was also crucial.

“We're not the innovators using this new legume pasture system; we're not the first to do it,” she said. “As my Dad used to tell me, don't be the first, be the second and be prepared to learn from others.”

The Butchers willingness to learn from others has led to good working relationships with a range of research organisations. Trials conducted by Department of Agriculture and Food Western Australia (DAFWA), CSIRO, Murdoch University and GRDC on the Butcher's farm have investigated the N-fixing benefits of serradella, various establishment methods, and its feed value.

“At one stage we had six separate trials on our farm,” Anna said. “I think it's important to be prepared to seek advice when adopting something new. There's a lot of good information out there.”

SUMMER SOWING BRINGS BENEFITS

The serradella variety (Margurita®) planted by the Butchers is a hard-seeded variety developed by DAFWA. Margurita®'s hard-seededness enables the pods to be sown in late summer, ready for germinating with the autumn break when soil and air temperatures are still warm. The Butchers sow 20kg/ha French serradella pods in summer (between January and March) with added legume inoculant (8kg/ha ALOSCA® G/S) to establish new serradella pasture. Summer sowing ensures the longest possible growing season and enables the legume to produce early season growth and fix nitrogen. Serradella pastures at the

Butchers' farm in late April this year already had 1t/ha biomass.

Summer sowing also means that sowing can be done away from the busy autumn cereal seeding time.

“Because we get all the seeding equipment out and into use in summer, it's all ready to go by the time autumn comes around. Summer sowing serradella means we get a head start on getting ready for seeding winter crops,” Anna said.

The hard seed and prolific seed production of Margurita® serradella means it self-seeds for future pasture rotations, so seeding it is not an annual job. The serradella rhizobia is persistent in the soil, so subsequent germinations nodulate successfully.

“We're using a year-in-year-out rotation with the serradella,” Anna said. “We use the pasture phase in conjunction with our cropping program.”

It is necessary to spray out the serradella before the cropping phase, but providing there has been good seed set in the pasture phase, the serradella regrows from soil seed stores in the following year, or the year after if the paddock is cropped for two years.

The Butchers grow wheat, barley, canola, oats and export hay in their cropping program and, since incorporating serradella into their rotations, have all but stopped adding nitrogen to crops.

“We add 100 kg ammonium sulphate per hectare on the canola at the flower buds visible stage, but that's actually to provide for the high sulphur requirement of canola, not the nitrogen,” Anna said. “We estimate that's been saving us about \$90-100 a hectare in nitrogen. It will be a bit less now because of the decline in nitrogen prices.

We are able to utilise these savings to ameliorate other production limiting factors on our farm. Currently we are using the savings to lime soils.

“Then there’s the added benefit of not needing to worry about whether or not we need to apply extra nitrogen in the middle of the season. If the season is going well and the crop needs the nitrogen, it’s there in the soil. If the season’s not so great and the crop doesn’t need the nitrogen, then it will stay there until the next year – it’s on-demand nitrogen. We really don’t have to worry about it.

“The other great thing about it is in a season like the one we are having now, with a lot of early season rain making the paddocks wet, we don’t have to worry about getting back on the wet paddocks, so we don’t have to worry about getting bogged. We avoid all that stress, inconvenience, mess and mucking up the paddocks because we don’t need to go onto the paddocks to spread nitrogen.

“On good soils, the serradella grows good biomass and fixes a lot of nitrogen; on the poorer soils it grows less biomass and fixes less nitrogen. We think of it as nature’s variable rate technology.”

DAFWA trials found serradella fixes around 20 kg N per tonne of dry matter biomass grown. The fixed nitrogen can be worth 40-50 kg N/ha for the next crop and around 10-20 kg N/ha for a second crop, depending on seasonal conditions. This means that in a 400mm rainfall zone (such as the Butchers’ farm), a 6-7 tonne/ha stand of serradella will leave enough soil nitrogen for two subsequent crops.

BENEFITS BEYOND CROPS

“There are also huge benefits with the sheep,” Anna said. “The serradella is great feed. It has deep roots so uses moisture from deep down in the soil profile, which means it stays green for longer. It produces a lot of biomass so it provides a lot of highly nutritious feed – we no longer use our trail feeder, and because of that we have also reduced mis-mothering in the flock because the ewes aren’t running off to the ‘meals-on-wheels’ and abandoning their lambs in the process.”

Anna said that due to the quality of the feed, the ewes’ ovulation has synchronised, so most lambs are born within a four to five week period. The flock conception rates are up around 98-99%.



Anna Butcher’s enthusiasm for Margurita® French serradella stems from the positive experience she and husband Colin have had growing it on their farm. Photo: Ben White.

“There’s a lot to be enthusiastic about. I don’t know why more people aren’t enjoying the benefits of growing it. It’s all about reducing risk, improving profitability and being more sustainable.”

DAFWA advises that the nitrogen benefits of growing French serradella are sufficient to warrant its inclusion as a green fallow on farms without livestock. **FA**

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