

Pasture Cropping — the key to keeping kikuyu profitable

Farm info.

Article by Michelle Handley and Greg Warren, Farm and General, Esperance

In 2007, after two years of cropping with poor yields followed by two years of annual pasture with low productivity, and increasing signs of wind erosion and non-wetting sands, Damien and Simon Schlink decided to plant kikuyu in three paddocks on their Mt Howick property, Dorglen (covering 5% of farm) to see if there was any truth to the word that was doing the rounds that kikuyu addressed non-wetting soil problems and stabilised easily eroded soils.

Grower: Damien and Simon Schlink

Location: Mt Howick, Esperance

Property size: 5750 ha

Ave annual rainfall: 425 mm (30% falling over summer)

Soil type: Acidic medium- to deep-grey/yellow sand over clay duplexes

Enterprise mix: 65% crop (cereals, canola and lupins), 35% subclover-based pasture (sheep)



They knew these paddocks were not profitable under a continuous cropping or annual pasture management regime and that soil type (acidic deep sand) limited the perennial species options worth trying. They were also keen that the species they selected required late winter/early spring establishment to take advantage of the normally reliable winter rainfall common in the Mt Howick area to minimise risk of failure due to moisture stress. Kikuyu came to the fore as the best option, a view reinforced by the winter dormancy kikuyu was known for as they expected this would still allow for annual legumes to grow over winter and spring periods.

Kikuyu established

Initially good establishment was achieved after seeding in September 2007, at a rate of only 1 kg/ha. Not used to the year round feed production from a perennial, Damien and Simon were happy with being able to hold condition of their stock over the first and second summer/autumn periods. While they didn't increase their stocking rate they were able to increase their stocking window by five to ten weeks. However, after the second autumn they began to see a decline in both winter kikuyu feed production and subclover and serradella

growth under the semi-dormant kikuyu during winter and spring. By the time the second and third summers (post-planting) came around they were also seeing limited growth response to summer and autumn rain.

By 2012, with wind erosion appearing to have been dealt with, visual signs of increased organic carbon in the top soil and a belief that the deep rooted nature of the kikuyu had recycled nutrients such as potassium and phosphorus from depth, Damien and Simon became dissatisfied with the lack of pasture productivity compared with other paddocks supporting winter annual pastures. They went looking for the next option to improve the profitability of these paddocks. Kikuyu was on a slippery slope to demise on Dorglen!

Kikuyu productivity in decline

Having started claying other deep sandy areas of Dorglen four years ago and investing in their own clay spreading equipment, one option Damien and Simon considered was to spray out the kikuyu, clay the three paddocks and bring them back into a continuous cropping rotation. Certainly this approach would be likely to continue the wind erosion and water repellence amelioration benefits the kikuyu had

provided and improve their return per hectare. Another option they were interested in was to pasture crop the paddock, having heard about the positive productivity results achieved during the Esperance 'Grain & Graze 2 Pasture Cropping Trial' at Neridup.

After deliberation, the decision was made to initiate a plan that incorporated both options in one of the Dorglen kikuyu paddocks. This was to be done by Pasture Cropping the kikuyu with lupins in 2013, claying the paddock in the summer of 2013/2014, and then deciding whether to plant with canola in 2014 and restart a continuous cropping rotation or not.

Damien and Simon's reasoning behind growing lupins was threefold. Firstly, lupins would provide the paddock with its first legume crop or pasture in at least seven years. Secondly, they allowed for use of the herbicides simazine and atrazine for radish control and the grass herbicide Edge (propyzamide) to be used for grass and kikuyu control. Lastly, if the kikuyu was a casualty of the planned spraying regime then so be it. However, given the importance of kikuyu as a management tool for Dorglen's most fragile soils, if the kikuyu survived the cropping, and they did decide to let



LEFT: Pasture Cropped lupins, October 2013
 RIGHT: Serradella and kikuyu recovering from rigorous pre-seeding knockdown and soil applied herbicides under lupin crop, October 2013

the kikuyu regenerate after the 2013 harvest, then the nitrogen input from the lupins would do the kikuyu the world of good.

In their minds they knew the kikuyu would have to be very resilient to regenerate as they were not going to treat it with kid gloves. A herbicide regime that included two knockdowns with glyphosate, followed by one with Edge was to be implemented to ensure the kikuyu would provide little or no competition with the lupins during flowering and podding.

Lupins seeded to improve paddock profitability

After seeding in May 2013, the lupins established well even though the top 10 cm of soil was initially dry. During the winter, rainfall was well above average leaving all of the continuously cropped paddocks impacted by waterlogging, but this was not the case in the pasture cropped paddock.

In addition, despite the herbicide regime implemented the kikuyu was regenerating, albeit thinly, and surprisingly — so was the serradella.

Harvest yields a surprise

By December it was time for harvest and time to see how the pasture cropped lupins had performed. Damien and Simon were impressed with the lupin yield achieved in the pasture cropped paddock which averaged 3.53 tonnes/ha. Dorglen had never

yielded lupins over 3 tonnes/ha before, and this result compared favourably with the lupin yield from a nearby continuously cropped Dorglen paddock which averaged 2.66 tonnes/ha.

Kikuyu survival was also a pleasant surprise. It had survived the rigorous chemical regime that had been implemented and while growth was thin and patchy in places it was growing well. As a result they were anticipating increasing their summer stocking rate in this paddock from four dry sheep equivalent (DSE) to six DSE, depending on summer rainfall. Summer rainfall would also dictate how long they would graze the paddock for but they are planning for somewhere between eight and sixteen weeks.

Confidence to expand Pasture Cropping

After seeing the lupin performance, Damien and Simon have decided they will pasture crop another 80 ha kikuyu paddock in 2014, and they will also promote kikuyu spread in their poorer

performing deep sandy paddocks. They are of course realistic enough to understand that the above average rainfall received in 2013 made it a good season to test Pasture Cropping but it has led them to consider phase farming to improve the profitability of their deep sandy paddocks. That is, two years of cropping into their perennial pastures followed by 2–3 years of pasture use providing time for regeneration of the kikuyu, subclover and serradella pasture.

Their experience in 2013 demonstrated that subclover and serradella can regenerate under kikuyu, as long as there is some form of herbicide induced kikuyu dormancy before the break of the season. The neighbouring non-cropped kikuyu paddock (earmarked for Pasture Cropping) was sprayed with Gramoxone in April 2013 to control newly germinated silver grass after which it was 90% covered in clover and serradella and 30 cm deep by late winter. Stock were removed from this paddock in early spring to allow for maximum legume seed set in the hope this paddock will be set up for good legume regeneration after being cropped in 2014.

Damien and Simon are still evaluating whether to make the investment to clay these paddocks or not. They can see that the kikuyu would survive the claying process and the kikuyu and crops may well perform even better with clay incorporated in the top 20–30 cm. Having wetting soil at the surface would certainly mean that seeding decisions with respect to crop choice and seeding depth would be easier. ✓



Post harvest Pasture Cropped kikuyu pasture, December 2013

