

Pasture cropping: can you have your cake and eat it too?

Background

The old saying 'you can have your cake and eat it too' might just come true if a new farming system proves its worth on Kangaroo Island. Pasture Cropping (PC) involves seeding a crop into an existing summer-active pasture stand without killing the pasture. The idea is that the crop grows in the winter when the pasture is in its dormant phase. As the crop grows, it will shade the summer-active grass and suppress its growth. This also helps to reduce green matter contamination at harvest. At the end of the season, the crop can either be harvested or grazed off.

The main advantage from a financial view point is the reduction of input costs. The real gains are about profitability (as opposed to production) as input and labour costs are low compared to conventional techniques. Paddocks can be grazed until the day of sowing and grazed after harvest as the summer-active perennial grass will be established and growing amongst the harvested crop. Livestock are an integral component of pasture cropping as they can provide flexibility to the system e.g. the crops can be grazed or mechanically harvested.

The key disadvantage to pasture cropping is that the crop yields will be lower initially until the system is established and you will possibly lose bragging rights at the pub for having the 'cleanest' crop!

Now this might all sound OK in theory but does it work in practice? The difficulty is that pasture cropping was developed in the eastern states in regions with summer rainfall and a high reliance on native grasses. We lack both on KI.

What was done

Kikuyu is a summer active perennial pasture that has shown excellent potential for KI soils and growing conditions. When used in a PC context there is the potential to grow more feed when kikuyu is traditionally less productive during the winter months, and the ability to hard graze the stubble as the kikuyu will be protecting the soil in the summer months.

A trial was established on A. & T. Heinrich's property to look at the options for sowing a crop (peas, lupins and oats) into an existing kikuyu stand. The kikuyu stand is three years old with an average cover of 40%.

The site was sprayed out on the 6 June with 2 L Sprayseed and 0.9 kg/ha Diuron plus insecticide. The aim of the herbicide treatment is to suppress but not kill the kikuyu. The site was seeded on the 8 June with Mitika Oats @ 120 kg/ha plus a small run at 240 kg/ha, Mandelup lupins @ 120 kg/ha and peas @ 120 kg/ha. Normal insecticide treatments were applied. An area adjacent to the trial (with no kikuyu) was also seeded to provide a comparison in crop yields with and without kikuyu.

Results

Due to seeding errors the area sown without kikuyu did not grow well and so 'district average' yields were used instead as the control values. The lupins were heavily grazed by possums and no harvest yields recorded. The oats and pea yields were calculated by cutting quadrant plots on the 10 December, and estimating the yield visually.

TABLE 1
Trial plan

No kikuyu present	Oats		Control	Lupins	Peas
Kikuyu present	Oats	Double oats	Control	Lupins	Peas

TABLE 2
Harvest yields

Crop type	Quadrant cuts	Estimated yield	District average
Oats	2.5 t/ha	3.5 t/ha	4 t/ha
Peas	1.1 t/ha	1.5 t/ha	2 t/ha

The site was not harvested and left as a standing crop. Seventy-nine lambs grazed the one ha site from 22 December until 19 January. When the lambs were removed almost all the peas and oats had been grazed but there was still excellent ground cover of kikuyu.

The percentage cover of kikuyu was measured before and after the trial to ascertain if pasture cropping (PC) would have any detrimental effect on the kikuyu.

TABLE 3
Changes in kikuyu cover over time

Condition of cover	7/4/10 % cover	23/2/11 % cover
Green kikuyu	38	35
Dead (stubble, annual grasses, kikuyu)	31	50
Bare	31	15

The cover had not changed significantly although the percentage of cover of kikuyu was significantly higher amongst the peas. This is possibly due to the heavier stubble and dry residue cover in the other treatments shading the emerging kikuyu.

This trial showed that PC, as a concept, will work on KI and achieve good results. Yields were less than for conventionally sown crops but realised greater grazing value and greater soil protection.

Funding/Sponsors

- Australian Government Department of Agriculture
- Fisheries and Forestry under its Australia's Farming Future initiative through Agriculture Kangaroo Island

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IMAGE 2
Oat crop coming up through kikuyu pasture



IMAGE 3
Kikuyu growth in the standing oat crop

Take home messages

Pasture cropping is an option for KI producers wishing to maximise grazing/cropping options.

The key principles are:

- Graze the paddocks down to 75-100 mm with livestock, or apply herbicides. Aim to suppress (but not kill) the pastures either with the judicious use of herbicides to burn the perennials or through appropriate grazing to take out the annual weeds.
- Zero till with a tyne or disc. Minimise soil disturbance as it kills pastures and encourages weeds. The aim is to open a slot and loosen the soil to create sufficient tilth for germination of the seed crop.