

Notes for potential grazing of Kikuyu

I find it fascinating in agriculture that what was considered impossible is often commonplace later on. For example, if I said that anyone in the Esperance region who receives more than 500mm/year rainfall on the sandplain with kikuyu pastures can carry 25-30DSE/ha, it would immediately make you say, “no way, not possible”. It is though ☺.

I think you could actually carry two cows + calves per hectare, but I will explain how and why later.

Actual carrying capacities

Using “actual” farmer performance data from two consultants here in my office, two farmers over *five* years have been averaging >5 DSE/ha/100mm growing season rainfall (one in a medium rainfall area, one in a higher rainfall area). How does that compare to your performance?

A better than average farmer only achieves ~2 DSE/100mm/ha, or ~1 steer/ha in a 500mm rainfall ! By the way, these two farmers are the most profitable clients with stock enterprises and are more profitable than nearly all cropping farmers.

So using *actual* data, 5 DSE/100mm in a 500mm growing season rainfall gives 25 DSE/year, or about 2.5 steers/ha – this is double to triple what many farmers are achieving. These farmers are also not using much nitrogen on the pastures and are not pushing really hard, so could do even better.

What’s the theoretical potential?

People may associate me with crops, but I also have a lot of fun growing cows on a small farm outside of Albany. It is in my nature in farming to always first work out “what is the potential”, and then “what is an achievable target that is the most profitable”. The latter is why I love seeing the best farmers wherever I go, or reading about what they are doing.

So firstly to some numbers on theoretical potential.

CSBP trials over many years show potential pasture production for *annual* pastures is 28kg/ha/mm. Roughly, 1 DSE (Dry Sheep Equivalent, usually a 45kg dry sheep) needs ~1kg dry weight per day to maintain bodyweight.

Using CSBP’s calculations, allowing for 50mm of rainfall as lost to evaporation, and the first 500kg as wasted (trodden on etc...), a 400mm growing season rainfall gives ~25 DSE/ha/year. A 500mm growing season is ~33DSE/ha/year.

A 450-500kg steer or dry cow growing at ~0.5kg/day is roughly 10 DSE. A 500kg cow plus a 4-6 month calf is ~22DSE.

Because Kikuyu is a C4 type of grass (ryegrass is C3), it produces even more biomass per mm of water. eg C3’s usually produce ~1g biomass per 450g water (at best it is about 360g water), and C4’s only need ~250g water. Therefore theoretically, the production potential off a kikuyu based pasture is even higher, especially with its deeper rooting ability.

I wont go into the detail here, but as the rotational and more intensive grazing system gets going, the pasture produced can carry even more animals/ha because it is of a higher energy and nutritional value. However, that is for the future when we are all ready to talk in energy and protein produced per hectare rather than just biomass and DSE’s ☺.

Doubling stocking rates

It is very easy to double stocking rates without extra fertiliser just by implementing a rotational grazing system. Trials from groups such as Evergreen have also shown that doubling the stocking rate can be achieved without extra fertiliser simply by rotational (cell) grazing. This is very easy to achieve in my experience as well, and is so easy with kikuyu based pastures.

Rotational grazing simply means bigger mobs in smaller paddocks for shorter periods. You should aim to have the paddock eaten down in 1-2 weeks before moving them into the next paddock. The most intensive system has paddocks grazed for one day and even down to a certain number of hours, but that is for the elite where there is unlimited moisture available.

For most though, start with the more conservative aim of 1-2 weeks grazing per paddock. It is an easier system too for moving the livestock. No dogs or swearing or chasing are needed when you have things right. They will know when you want them to move.

In my case, the cows are moved from one paddock to another after as little as 1-2 days for one small paddock, and up to 2-3 weeks in the biggest paddock.

The cows are now very well trained. All we have to do is stand at a gate that we want them to come through and call "come on". They run through the gates when called. Piece of cake! They totally ignore me though when I sing, talk, whistle, or yell "Go Dockers". ☺ I have to keep working on that last one.

All you need to do is only do one thing that you never do at other times when you want to move the livestock. For me, that is yelling "come on". For others, it can be a toot of the horn, or a certain motor bike or ute that you use, or have a flag sticking up on the bike or ute.

To train them, use food☺. A few days before they are ready to move into the next paddock, give them some hay, grain or pellets and call or toot etc... Whatever you choose to be the signal that you want them to move into the next paddock, only do that when you feed them.

Then on the day you want to move them, again have some hay, grain or pellets to give them and call or toot and open the gate into the next paddock. Put the feed on the ground in the new paddock. They should all run through the gate.

After a few times, you should not need food as bait. For example, I can open a gate, walk amongst the cows, drive amongst them etc... and they just stand and watch or go back to eating.

But if I stand at the gate and yell "come on", they know it means new food and they run through the gate. I can even get them to follow me across paddocks by calling out "come on".

Calving/lambing times

Trials on the Alcoa farm in Pinjarra showed a 20% increase in stocking rate was possible by matching calving time to feed availability.

So what we do is calve in July (the worst feed time on our farm) so that it is easier to keep the feed intake down of the cows in the last month before calving (less calving problems), and the increasing pasture growth in Spring matches the increasing feed requirements of the calves.

Peak DSE then matches peak pasture production and peak quality. Our peak DSE should be ~75-80/ha next Spring, which is getting closer to the theoretical potential.

Though July is not usually the worst feed time in most areas, it is still the time when the feed levels start increasing into the Spring and it would be ideal to match the livestock's feed demand with this.

Some basic principles

- 1) pH and trace elements are must fix factors. No system can be pushed and achieve maximum profits until these are not a problem.
- 2) Hybrid vigour is something you must use. Pure bred bulls crossed with a different breed of pure bred cow produces offspring with hybrid vigour. This can be 10-20% extra growth, free.
- 3) Calm animals grow faster, and produce better quality meat. Being able to walk amongst them and get them into yards or other paddocks without dogs needs to be a priority.

When selecting future bulls, docility must be a high priority, as well as small calves for heifers, good mothering and milk supply etc...

For the cows though, you should be able to use a bull with a little more performance on the 200-600 day growth EBV's.

4) For cattle, the ideal pasture height is 5-10cm. Below 5cm, the pasture is not growing as fast as it can. Above 10cm, it is shading the lower leaves and starts slowing down in growth, and decreases in quality. Down the track you will be thinking in terms of growing energy, not just pasture or biomass, but I don't want to confuse you on that just yet☺.

5) Redlegged earth mites are not to be tolerated. Each pasture paddock should receive 50ml Talstar at the break of the season. 100-150ml Lemat can also be added if lucerne flea or Bryobia are a problem on any of your paddocks.

6) When tough years come, some livestock should be put on a truck and sold. This is the part of the system that most are scared of and is why they feel more comfortable to stock for a worst case scenario. Conversely, more livestock should be brought in, if feasible, when a very good season is happening.

Profits

I know that when people hear about higher than average stocking rates, as in the farmers achieving >5DSE/ha/100mm), there is scepticism. When they then see the property and the cows/sheep concerned, they say it can't be profitable, or is too hard, or wont work on their farm etc...

Allow me to briefly run through the history of our two years so far on this little farm.

The farm was very acid and very low in fertility when we started. The soils range from acidic peaty bogs that grow stuff all in winter and not much more in summer, to shallow coffee rock that dries out a few weeks after the last Spring rains, to the typical non-wetting white sands of the south coast. July is the worst feed month as it is waterlogged, cloudy and cold. Pasture growth rates are often 3-5kg/ha/day at that time of year.

Average stocking rates in the district are only 6-8DSE/ha, despite 700mm rainfall – too much rainfall. Lots of hay is fed out to get livestock through the cold winter, and in Autumn if summer rains are scarce.

In year one (2004), initially I was not too concerned about profit because it is a very small farm and I wanted to get it pumping as quickly as possible. I did all sorts of experiments to see what was needed the most, and what wasn't.

The peat areas got 6t/ha lime, and the rest ~4t/ha. Selenium, Cobalt, molybdenum, copper, zinc and manganese were all spread with the fertilisers. Total costs for the year were \$615/ha for seed, fertiliser and lime.

In 2005, we spent ~\$350/ha on seed and fertiliser. At the end of the year (23 months after the initial soil tests), further soil tests were taken to see how the pH, P and K levels were going. It showed we still needed more lime, a little more extra P on two paddocks, and the potash levels are now fine (>100ppm).

In January 2006, more lime was spread (4-6t/ha) plus ~250-300kg/ha of Super CZM and ~250kg/ha of Ammonium sulphate on selected areas. Budgeted costs are expected to be ~\$450/ha for the year.

That should be it for the lime and trace elements for the next five or so years☺. Just plain DAP or MAP, Urea, Ammonium Sulphate and a little potash are planned from now on for the next few years. Dash's of cobalt and molybdenum are done once or twice a year in the fertiliser spreading. Another dose of selenium chips is probably going to be done in 2007 or 2008.

From 2004 into early 2005, we carried ~46DSE/ha. All the steers were sold and we switched to all cows and heifers by June 2005, mainly because we want to see lots of baby calves frolicking around☺. We currently have 40 cows/pregnant heifers on the 10.5 hectares.

They will calve in July-August 2006. By January 2007, that will be the peak DSE time (40 cows + calves = 22DSE * 10.5 hectares is approximately 84DSE/ha (plus the bull☺). In late January to early February, we plan to sell the steer vealers and worst heifer vealers, but keep the best ones and sell the worst cows to get back to the 40 or so cows that we are very comfortable at carrying.

As the paddocks get knocked into better shape, we might be able to carry a few more in the better seasons, but time will tell.

It is true to say that I am more concerned about how much beef I can produce off a postage stamp than I am about absolute profit, but that is me☺. As long as it is well above break even, I am content. However, the profit is on course to be quite significant - >\$1,500/ha.

The inputs are only about one vealer calf or less per hectare. That leaves about three of the calves per hectare as profit. I think that is a nice profit ratio. That is not true profit of course because of the original costs of cows is not included, but hopefully you get the gist of it.

We do not feed pellets or grain, only a little hay as roughage when there is too much nitrogen in the pasture – runny poo's! We only feed about 1-2 small square bales a week when needed, which is not very often. The pastures provide plenty of feed to support the animals.

Getting your kikuyu pastures pumping

It really is nonsense to say you can't fatten livestock on kikuyu. If you feed it with some nitrogen, and keep grazing it hard in rotation, the cattle have no problems bucketing on the weight.

Kikuyu based pastures should be permanent pastures. They must be rotationally grazed, so aim to have mobs big enough to eat the paddocks down in 1-2 weeks. For most people, it will not only mean having bigger mobs, but using more electric fencing to get more smaller paddocks.

To begin with existing annual pasture paddocks and convert them into kikuyu, graze heavily through the winter then de-stock paddocks in the first week of August. Spray them out two weeks later with 2L/ha of Roundup + 1% AMS + 0.1% wetter, then prior to sowing the kikuyu two weeks after that, spray again with 1-2L Sprayseed + 50ml Talstar + 150ml Cypermethrin + 0.1% wetter.

Then sow the same day with 1kg/ha Whittet kikuyu seed at 0.5-1cm deep, preferably with a disc seeder and press-wheels. Ideally, pickle the seed with 1L/tonne of Cosmos insecticide if possible. This will help control false wireworm and early grass-hopper problems which are common.

Because kikuyu is to be the main base to your pastures, I am not a fan of trying to establish other species at the same time as the kikuyu, like Rhodes grass, tall wheat grass etc...

It is helpful to topdress any fertiliser like Agras, Agstar, MAPSCZ etc... that may be left over from sowing the winter crops. It is safer not to drill it with the seed as any with the seed will actually slow down its germination.

As soon as the plants have germinated safely, nitrogen needs to be topdressed or sprayed before rain which will help the kikuyu establish its roots faster.

The kikuyu must not be allowed to grow rank. Hard crash grazing followed by 4-6 weeks of rest would be ideal. Do not let the stock pull runners out.

Weeds and insects must be controlled completely from sowing until the kikuyu has sent out plenty of runners. Main pests on the south coast are wingless grasshoppers, false wireworms and Balaustium mites. As long as you have Cosmos on the seed, you will give yourself a few weeks protection from false wireworms.

However, 300-400ml Cypermethrin is needed for Balaustium mite control and this will also control any hoppers and false wireworms. However, residual grasshopper control is best achieved with 6-10ml/ha Regent (200ml/L Fipronil). This can be mixed with the Cypermethrin if needed.

If you need to control broadleaf weeds in the young kikuyu, mixtures of Affinity + MCPA Amine, or Dicamba + MCPA can be used safely a few weeks after emergence.

In the following May when conditions are getting cooler and wetter, clover, serradella, ryegrass and winter active tall Fescue (eg Fraydo, Resolute or Fletcher) can be drilled into the kikuyu, or topdressed and pressed in by large numbers of livestock (usually the day before taking the stock off the paddock).

A typical fertiliser regime for a highly productive kikuyu based pasture would be 250-300kg Super:Potash 4:1 or similar in March-April, 75-100kg Urea in May or soon after the break of the season, and in mid-August, 75kg Muriate of Potash + 100kg Ammonium Sulphate + 75-100kg Urea.

You are probably picking yourself up off the ground after reading that☺.

However, if trace elements have not been applied for a decade or two, you may also need to apply 200-300kg/ha of Superphosphate Copper Zinc Molybdenum, which also helps get your phosphate levels up. Phosphate and trace element levels must be high before you can start getting the best out of your pastures and livestock.

You may also need to get Selenium chips blended in with the fertiliser. Recommended dose is 0.3kg/ha/year or about 1% of the fertiliser.

I also bought a tub of Cobalt Sulphate and spread about 20g/ha each year after an initial dose of 200g/ha in the first year. I mix it in with the other fertilisers.

As the system starts pumping, you will gain more benefits from applying more phosphate in late winter as well as autumn. Nitrogen and sulphur are the crucial ones for kikuyu. The other fertilisers are mainly for the legumes and other grasses or species like Chicory.

Other species with kikuyu

You do not need to, and should not spend a lot of money on sowing new pasture species with the kikuyu. Start with what you have on the annual pasture species but improve their nutrition, then and only then, consider if there is a need to introduce some better species and varieties.

The new winter active Tall Fescues, as well as annual and perennial ryegrass are the main species to add to the pastures. I have found it best to spread the seed with the fertiliser the day before we take the cows out of a paddock. This gets a lot of it trodden in by the cows and is when the pastures are eaten off, giving more sunlight for new seedlings to get established.

Expense of these seeds is a big problem. Best to grow some on dedicated areas of the farm, and then harvest them to spread around the farm more. Seed companies do not like this of course, and warn that the germination of the seed will be very poor. This has not been a major problem in my experience though.

I buy any old ryegrass seed from farmers who harvest it and spread it at 5-20kg/ha with each fertiliser spreading between May and August. This is working fine for me.

With rotational grazing, clovers will thrive. You will actually struggle to keep enough grass in the system if you are stocking towards the limit. This is because they will eat most of the grass seed heads and will prevent it from setting seed.

Perennial ryegrass works in beautifully with the kikuyu and annual ryegrass. There are wet patches that the perennial ryegrass grows in all year round and is too wet in winter for kikuyu to hang in. In the drier areas, perennial ryegrass is the first to re-shoot with the first Autumn rains and the annual ryegrasses come from the new seed we spread.

As the Autumn temperatures decrease, the kikuyu slows down and the clovers and ryegrasses take off. In late Spring when the clovers and ryegrasses slow down, the kikuyu starts thriving. The system works in beautifully together.

The only species I can see at the moment that should increase the pasture production are Chicory and the winter active Tall Fescues. The newer tetraploid ryegrasses can perform better than ryegrasses, but the cost is enormous and I can only see them offering a relatively small increase in production.

Far bigger gains come from nutrition, insect management and rotational grazing. You need to keep your eye on that ball first. pH, insects, then trace elements, then phosphate, then all the other nutrients, then pasture species is the order of importance!

The pH of all paddocks needs to be raised steadily to 5.0-5.5 in Calcium Chloride (CaCl₂).

As mentioned earlier, rotationally grazing is one of the biggest steps to increasing profit in a livestock system. Shifting the animals is actually easier, not harder in this system.

Summary

I strongly encourage you to go and see farmers who are achieving well above average profitability, and start off with your own 4-6 small trial paddocks that are next to each other.

On these paddocks, start fertilising with whatever the pastures need (as suggested above) and stock at your current stocking rate. So for example, if you are currently at 8DSE/ha and your little trial paddocks are 10 hectares each and there are four of them, put 320 DSE in the first paddock ($4 \times 10 \times 8 = 320$).

As soon as they have grazed it down, topdress fertiliser and perhaps grass seeds the day before you take them out of the paddock, then move them into the next paddock. Continue with each paddock until they are back in the first paddock. Add more stock though if they are taking longer than 1-2 weeks to eat it all down – you will need to add a lot more !!

This little trial will show you how the system works and give you encouragement to start implementing it onto the rest of your farm.

At the start of this article, I mentioned that those in Esperance with 500mm rainfall and kikuyu based pastures will be able to carry two cows + two calves per hectare. Hopefully the above shows you how.

Two cows is about 20DSE/ha. Calve when pasture feed is starting to increase and this will help you utilise the pasture much more efficiently. Peak DSE will be about 44DSE in this example, giving a 12 month average of about 30DSE/ha. I expect you will be able to achieve even better as you keep on improving the system.

Have fun!

Regards,

Wayne Smith