



A mix of annuals and perennials has all bases covered

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Nine Mile paddock is classic Gingin Redgum country, mostly red sand over clay, with the odd patch of poorer white sand. These soils, due to their well-drained nature, usually support a capeweed dominant annual pasture and the occasional oaten hay crop.

After having had some success sowing subtropical perennial grasses on another Redgum soil type paddock in 2002, I decided to sow half of Nine Mile paddock to perennials in early September 2003. An early Rhodes grass-dominant version of the 'Evergreen Mix' was dropped on top and rolled in after a double knock.

The perennial grasses (especially Rhodes Grass) established well, although the small amount of Shorohie millet that was added to the mix soon died out. Then in late August 2005, the other half of Nine Mile paddock was sown to a mix of Gatton panic and Rhodes grass. This time a combine fitted with knife points and press wheels was used to sow the perennials, and apart from some insect attack (probably cutworms), these perennials also established well. A large amount of summer rain in early 2006 saw more panic germinate and helped to fill in some of gaps caused by the earlier insect damage.

Natural nitrogen fixation

Due to historically low legume content in the paddock, a mix of annual legume species was sown into the perennials in early June 2007 following a knockdown

of SpraySeed. Due to the variation in soil types (from very shallow sand over clay to deeper white sand), a wide range of legumes were used including Dalkeith and Urana subclover, Santorini and Margarita serradella, Paradana balansa clover, Prima gland clover and Cefalu arrowleaf clover. Over time, the balansa and gland clover have thrived on the more fertile shallower sand over clay, while the deeper rooted serradella has performed best on the deeper sand. Blue lupins have also made a comeback on the poorer sands, and I am in two minds on how to manage them. I know that they will out-compete the serradella, so I have controlled them occasionally with slashing. However, because the serradella has struggled to dominate due to the string of tough seasons, I appreciate the nitrogen input of the lupins in the short term. If and when the serradella thickens up, controlling the blue lupins will be a 'no brainer' as the serradella is palatable and the blue lupins are not.

Impact of the seasons

Seasonal conditions have a big impact on pasture composition during the 'annual' growing season. In the wetter years, such as 2009 and 2011, annual

legume content was good (30 to 50%) and contributed both valuable feed and nitrogen (N) fixation. However, in very dry years such as 2010 and 2012, legume content was very low (<10%) and annual grasses constituted the majority of the pasture. Even though the annual legumes are acting as 'fair weather friends', they are a still a critical part of the system due to their N fixation and ability to produce a bulk of high quality spring feed in good years that can be carried over into early summer. The N fixation is not only critical for the long term productivity of the subtropical perennial grasses, but also the annual ryegrass component of the pasture which is the major source of winter feed.

In good springs, the paddock is rested from August until November to allow the paddock to bulk up and maximise seed production from the aerial seeding annual legumes and ryegrass. Cows with six month old calves are then grazed on the paddock during December, and they thrive on the mix of dry annual pastures and green perennial grasses. If the late spring has been wet, the perennials will be lush while the dry feed will have declined in

Farm info.

Grower: Philip Barrett-Lennard

Location: 'Beermullah', Gingin

Property size: 426 ha

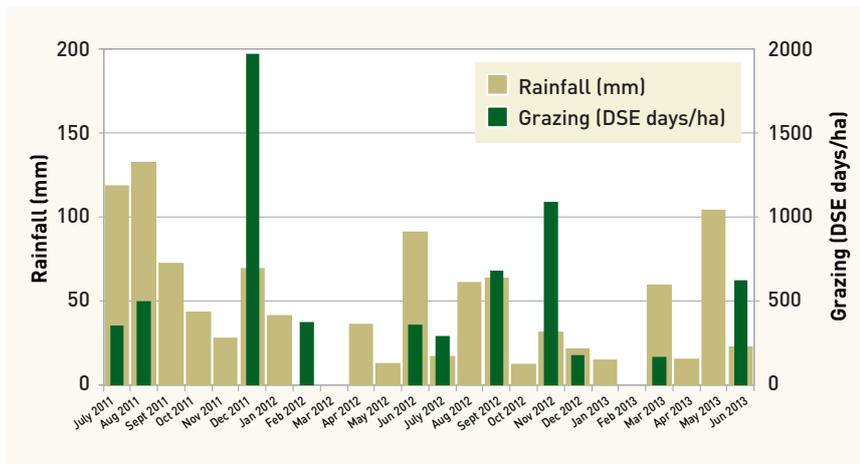
Ave annual rainfall: 100 year

average: 700 mm, 10 year average: 500 mm

Soil type: Sand over clay (various depths)

Enterprise mix: 100% beef cattle

FIGURE 1. Monthly grazing days and rainfall for Nine Mile paddock



both quality and quantity. But if the late spring has been dry, the dry feed will still be reasonably high in quality, but the perennials won't be so impressive.

Grazing records show benefits

Stock movement records show that in the good years such as 2009 and 2011, the grazing of accumulated dry annual and green perennial pasture in December contributes significantly to yearly carrying capacity (see Figure 1). In December 2011, 103 cows with calves along with 28 yearling heifers strip grazed the paddock for three weeks, the equivalent of 5.4 DSE/ha. This was 55% of the total yearly stocking rate of 9.78 DSE/ha. As well as supporting a high stocking rate, the grazing in December also (anecdotally at least) produced significant cow and calf weight gain. Weaning weights taken in January 2012 indicated well above average

weaning weights, a result of the mix of green and dry grass plus an extra shot of mother's milk!

Subsequent grazing over summer and autumn is often sporadic, and heavily influenced by the presence or absence of summer rain events. On this shallow sand over clay soil type, the perennials do not stay green for extended periods between rain events. The Gatton panic in particular will go into dormancy and stay completely brown until the next rain event. After a rain, the initial pasture growth is rapid, before quickly petering out when soil moisture is exhausted.

Grazing management in recent years has been rotational grazing, with strip grazing used in the December grazing to minimise trampling and maximise utilisation. Fortunately the paddock is long and thin, so reasonably short cross fences can be quickly erected using

temporary electric fencing (fibreglass rods and polybraid). At 25 hectares, the paddock is too big as it is, and needs subdividing eventually. But the flat terrain makes it hard to move water quickly using gravity, so until a second tank is installed, the paddock will stay in one piece with strip grazing employed when there's too much feed to graze it efficiently all at once.

In the first few years of the perennial stand, I set stocked my weaner heifers on this perennial paddock over summer. The heifers did quite well, but the pasture suffered, and in particular the more palatable Gatton panic. A recent move to growing standing fodder crops on other paddocks for the weaners to graze over summer has meant this practise has stopped, and the perennials appear to be far better for it.

Looking back to move forward

Fertiliser inputs over the last five years have been minimal, due to a strong fertiliser history and the fact that recent soil and tissue testing hasn't revealed any glaring deficiencies, except a low soil pH of 4.7 (in CaCl). As a result, high quality Lancelin limesand was applied at 2 ton/ha in early 2012. Soil fertility is also boosted by the presence of thousands of dung beetles, which are known to mineralise the nutrients in cow dung. They also do a great job of aerating the soil!

Watching this paddock change over the last ten years, I am confident that the range of annual and perennial pastures now growing in Nine Mile paddock (25 species and counting) has made it both a more productive and more resilient pasture. The fact that we now have species that are better suited to each of the different soil types in the paddock, and that will respond to rain at any time of year, has certainly seen productivity improve. And when you factor in the drought tolerance of the perennials and the hard seed bank of the annual legumes, I think the pasture is now more resilient, so it can quickly bounce back into full production following a tough season. ✓



TOP LEFT: Attendees inspecting Nine Mile paddock at an Evergreen Field Day in September 2009.

ABOVE: Cows and calves strip-grazing Nine Mile paddock in late December 2009.

BOTTOM: Prima Gland clover has performed well on the shallow sand over clay soils.