

Higher production from Creebank pasture

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Introduction

The Williams family are based in the Hunter Valley, an area not noted as being suitable for perennial ryegrass. Over a number of years they have developed a farming system that uses ryegrass as the main feed base of their dairying operation.

Creebank

Creebank is a 220 hectare family operated dairy farm at Vacy (located approximately 30 kms NW of Maitland) supplying National Foods with 2.2 million litres of milk annually. We milk 300 Jersey cows with a rolling herd average of 6,000 litres of milk, 300 kg butterfat at 5% and 227 kg protein at 3.8%. There are another 398 head of cattle, made up of 62 dry cows, 249 heifers aged from 2 years down to calves and 97 beef animals that range from local trade vealers to calves, plus hundreds of kangaroos. Rainfall is a very variable 900mm, supplemented with irrigation from the Paterson River. Creebank has a water allocation of 1,000ML. 125 hectares of perennial pasture is irrigated by 7 hard hose travelling irrigators.

Soil ain't Soils

It is interesting that a paper on Creebank has been slotted into the session "Greener grass- from the soil up". If this paper was presented a few years ago it would have been an amusing placement because the majority of the farm had no soil. An agronomist may have described Creebank's 220 ha as being 25 ha of alluvial river flat, 40 ha of clay soil with the remaining 155 ha being sandy loam or sandy clay loam with the subsoil being gravel or rock. Sandy loam may sound like highly productive farm land but at Vacy this soil is politely described as gently undulating, gravely iron bark ridge country. Basically gutless dirt with phosphorus levels close to zero.

Back to 1970

In 1970 Creebank had a milking herd of 60 cows averaging 3,000 litres. Milking area comprised about 55 ha made up of 25 ha of irrigated pasture (oats, clover, paspalum and lucerne). This was subdivided into 6 paddocks and strip grazed during the day. At night the cows were rotated around three 10 ha paddocks that comprised of 'native grasses' (kangaroo grass, native Parramatta grass, couch and a sprinkle of paspalum). The remaining 130 ha was divided into 3 paddocks of native pastures and ran about 10 dry cows and about 40 replacement heifers (higher numbers of replacements back then as we had to grow our heifers out longer to get them up to mating weight). Ground cover was poor as bare patches could be seen between plants. 1972 saw the construction of Lostock Dam on the Paterson River.

Creebank discovers fertiliser and one thing leads to another

With guaranteed water supply, the then king of ryegrasses, Kangaroo Valley, replaced oats. Here was a grass that produced high quality feed through the winter and spring months and only needed to be replaced every few years. One of the advantages dairying has over most other livestock industries is the ability to monitor production daily via the dip stick on the vat. Soon it became obvious that higher quality feed leads to more milk and more milk leads to the *most essential fertiliser in any business and that is money*. The more money made the more you can plough back into your business. The dairying industry in the 1970s and 80s was regulated by a quota system which required a farm to produce a minimum amount each month.

With the farm now drought proof and 95% being flood free, Creebank was able to turn high quality perennial pastures into more autumn and winter milk that enabled us to increase the quota and farm income. Surplus milk prices rose in autumn-winter to encourage farms to produce milk at that time of year, so the business was able to make extra income from feeding quality perennial ryegrass at this time. In the current deregulated market, prices are still higher in autumn-winter.

With the extra income we began to divide the dryland areas into smaller paddocks (about 10 ha). These paddocks were fertilised with 375 kg/ha of single Mo super and sown down with sub and Haifa white clover. Pastures received a maintenance application of super at 240 kg/ha. The results achieved were phenomenal. Sparse native pastures became high producing pastures suitable to feed a high producing dairy cow. The herd could now be grazed day and night for much of the winter-spring period. Dry cows maintained their body condition, which in turn increased their milk production in early lactation. Heifers grew faster, reaching joining weight sooner thus reducing their calving age to 2 years. Cow numbers increased to 100 and production rose to about 4,500 litres/cow. All these benefits came about because one limiting factor, phosphorous, was addressed.

Creebank builds a fertiliser factory

In 1980 there was an expansion of the poultry industry in the Hunter, and Creebank diversified into turkeys with annual production of 30,000 birds. A by-product of these birds was their manure which was spread onto irrigated pasture. Soon it became apparent that not enough fertiliser was being used. With 12 m³ of manure/hectare being spread in the autumn and again in the spring, ryegrass was now a dark green colour and clover was more vigorous. With extra high performing pastures an 8-a-side herringbone dairy was built to handle the extra cows that the farm was able to carry.

In 1995 a choice had to be made to upgrade the turkey business or expand the dairy side of the operation. With increasing pasture production and the opportunity to grow the pasture base it

was decided to close the turkey operation and expand dairy production with the conversion of the dairy to 15-a-side. At this time the use of on-farm manure had outstripped supply; manure was being purchased from off-farm sources and this continues till today.

Irrigation increased

During the 80s the irrigation area began to increase with the use of travelling irrigators. The dry land ridge blocks were divided into blocks of about 3 ha. It was then possible to grow perennial pastures all year round. The expansion of irrigation continued up until the present allowing an area of 125 ha to be irrigated. This year has seen the purchase of new irrigators that are more efficient, allowing us to water 24 hrs a day. The 08/09 summer was one of the driest that we have had for a number of years yet we were able to graze all our stock with no need to purchase fodder.

90s to the present

With the introduction of vastly improved strains of ryegrass and with additional fertiliser, Creebank now had high performance perennial ryegrass pastures that produced high quality feed through to January. As with anything that is high performance, it needs tuning and this is where the Williams family pastures were falling down. The partnership formed with the DPI, especially Neil Griffiths, and also Kerry Kempton and Ray Johnston, played a big part in fine-tuning dairy performance.

It was Neil who saw the ability to unlock extra potential from better grazing management of pasture with little or no extra input. Neil introduced farmers to the idea that the 3 leaf stage of ryegrass as the optimal time to graze. Neil also taught farmers the concept of dry matter and kilograms of dry matter/ha.

With the introduction of plant patents a flood of new varieties hit the market. Neil ran a number of variety trials. These trials were the standard plot size but there were also trials in conjunction with the Williams family of perennial pastures that involved cages, stage of growth cutting and paddock-sized variety trials. We will often plant

a paddock-sized trial of a new variety as soon as it hits the market.

When Creebank purchased a round baler, only hay was made. Being only 50 kms from the coast, it was difficult to make hay in the spring. Early attempts at round bale hay resulted in a large number of bales with biochar centres and it is lucky that no bales spontaneously combusted. Bad weather often resulted in pasture being past its best, resulting in poor quality hay. Neil was an advocate for round bale silage and we made the switch to silage.

Over time, with advice from DPI, we have improved the quality of round bale silage produced. At first crops that were allowed to become reproductive were ensiled, that is, they had seed heads. Often silage was too dry due to a poor understanding of dry matter content. Present-day silage is made from ryegrass just past the 3rd leaf stage. Although this yields a lower quantity, it is more than made up through improved quality. Quantity is made up by a quicker turn around in cuts. Silage is an essential tool in Creebank's pasture management by maintaining pasture quality in spring with conserved excess pasture, which provides high quality silage that can be fed in autumn.

The 90s saw the introduction of direct drilling pasture. The rotary hoe, chisel plough, harrows and broadcaster were all retired. Now all seed is drilled directly into pastures sprayed with glyphosate herbicide or drilled into existing pastures to extend their productive life.

Cattle are often overlooked when it comes to pasture. It was DPI officer Ray Johnston's work on early weaning of calves that has led to an improvement in the way we rear quality calves. Quality animals are crucial to obtaining the highest production from quality pasture.

What nutrients are in chicken manure?

When bulk poultry manure first became available in the Hunter Valley, many believed that chicken manure was mainly a nitrogen fertilizer. At the time very little was known of the nutrient content of what is known as chicken litter. Neil analysed dry matter content, what weights were in a cubic metre, nutrient values

of differing batches and best practice for litter application. It was shown that different batches of litter have varying nutrient levels with average N:P:K levels being 3:2:1 on a dry matter basis, although figures can vary 100% up or down. It was through Neil Griffiths' work that involved sampling litter batches and paddock trials that it became apparent that the phosphorus content had been undervalued.

The long-term applications of an annual 24 m³/hectare of turkey litter over the farm returned soil tests with a Colwell P test of 400. Paddocks with short history returned readings of 250 Colwell P. Other nutrient readings were satisfactory. Present day maintenance applications of 14 m³/ha now have Colwell P levels around 150-200.

Present day

Today the 125 ha of irrigated perennial pastures is divided into 32 paddocks ranging from 2.5 ha up to 9 ha. Each paddock has a water trough allowing cattle to graze without having to leave for water. There is an internal gravel laneway network of about 4 kms—gravel is quarried on the property. Most paddocks are sown down to a mix of Alto or Arrow perennial ryegrass, Haifa white clover, Tonic plantain and Aurora lucerne. In late summer-autumn summer grasses appear in the grazing mix. We are not fans of kikuyu and discourage its establishment, although it gradually re-invades paddocks resulting in the need to be sprayed out with glyphosate. The remaining 95 ha is made up of 70 ha of dryland Haifa white clover, annual and Kingston perennial ryegrass.

Each year we plant 8 ha of forage sorghum (Pacific BMR). This crop is made into round bale silage and is fed to dry stock during winter. This year some irrigated paddocks have been oversown with Heritage Seeds B Double mix Barberia and Bealy. With this mixture we hope to get a result that will have similar bulk to an annual pasture yet be able to persist into the autumn. These pastures will be completely renovated in 2010. Any pastures that have thinned will be direct drilled with the perennial mix. Perennials are preferred over annuals because of their longer growing season. Although not out-performing annuals for early bulk, the perennials give Creebank a flatter, longer quality pasture season.

Establishment of pasture begins in late March when paddocks are grazed heavily with a herd of dry cows and in-calf heifers. With couch being a weed problem, paddocks are sprayed with glyphosate at the recommended rate, and the following day the paddock is direct drilled. Pasture renovation usually continues until late May with about 25% of the irrigated pasture renovated each year. Irrigation may be required to germinate seed. No fertiliser is used at planting with pasture receiving 95 kg/ha of urea when plants are between 25 and 50 mm. After the first grazing, pasture receives approximately 14 m³ of chicken litter. Urea is strategically used throughout the growing season.

Renovating pasture causes a feed gap that is filled with conserved round bale silage fed out in feed rings that are placed on a concrete feed pad. Cows move to the feed pad with access to ad-lib silage, usually following the afternoon milking before being offered a strip of pasture. If pasture supply is tight cows may be given silage after the morning milking as well. If pastures are too wet and likely to be damaged by pugging, the silage pad acts as a sacrifice paddock and the cows are fed ad-lib silage all day.

The spring at Vacy is often dry and the Williams family strongly believe that the use of irrigation before the pasture becomes stressed is the best way to obtain maximum production and persistence from ryegrass. Too often one can be lulled into a false sense of security with the promise of coastal showers. It is in spring that the ryegrass produces the highest quantity and quality that can be greatly enhanced by paying attention to water and soil fertility.

Pasture growth begins to increase in July negating the need to feed silage and by August paddocks are selectively locked up for silage production. Around 1,100 bales are conserved and approximately 200 bales of hay are produced in summer. We own all the silage equipment required, allowing us to be independent of contractors and to conserve fodder at the optimal time.

All pastures are strip grazed with a fresh strip being offered day and night, and after the milking herd has grazed, a following herd of dry cows and in-calf heifers are used to clean up any

residual grass. Rarely is a slasher or topper used. The aim is to utilise as much pasture as possible whilst maintaining cow body condition. To do this I use a few simple visual tools from the Pastures for Profit program that has been rolled out by the DPI's dairy officer Kerry Kempton and district agronomist Neil Griffiths. Simple observations are used to adjust rotation length and supplementary feeding.

Grain is the only feed purchased, with cows being fed supplement at milking time, based on production and stage of lactation. An average of 4 kg of triticale and 2 kg of pellets is fed per cow per day. Many people forget that dairy farmers are also beef producers with Creebank selling approximately 100 tonne liveweight of cull cows and vealers each year.

Where to from here

Creebank's short term goal is to reduce the number of beef animals and increase the dairy operation. There are no 'silver bullets' on the horizon for lifting production. Gains are going to come from better management through paying attention to detail. Simple fine-tuning of grazing management can have a huge impact on quantity and quality of pasture produced. Irrigation efficiency is another area that Creebank has looked at in the past year.

Over-capitalisation is always a danger and we always try to keep things simple by using grazing as the most cost effective way to produce a viable income. Sometimes more pleasure can be obtained from the box the toy comes in than the toy itself and at times I think we make pastures and grazing more complicated than it needs to be. Income is the most import crop produced on a farm and a holistic approach to all aspects of farm management is needed to obtain high productivity from pasture.

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Farm snapshot

Total area 220 hectares

Milking area 73 hectares

Irrigation 125 hectares

Herd size 300 Jersey cows

Milk production: rolling average of 6,000 litres of milk, 300 kg BF at 5%, 227 kg protein at 3.8%

Silage: 1,100 round bales per year, plus 200 round bales of hay

Concentrate: average of 4 kg of triticale and 2 kg of pellets per cow per day

Dairy shed: 15-a-side herringbone

Pastures: high performance perennial ryegrasses direct drilled and irrigated + plantain, white clover, lucerne