

INTRODUCTION

Kikuyu is consistently a key feature of the Northland pastoral scene. When asked what they would like to see more research done on, kikuyu management is always a key part of the response by farmers. Formed in 1999, the Northland Kikuyu Action Group Inc (KAG) comprises farmers, advisers and researchers who have conducted trials and commissioned research on practical options for the management of kikuyu-dominant pasture.

KAG still seeking non-tractor management tools for sheep and beef farmers



Thanks to a grant from MAF's Sustainable Farming Fund, a major current KAG initiative is looking at kikuyu management methods that

don't require a tractor. Three options are being considered. The trials are entering their third and final year of monitoring, with final results and conclusions due out in February 2009.

Role of Breeding Cows:

Breeding cows have the capacity to control rank kikuyu for a short period with little impact on farm production. This trial is looking at whether using breeding cows to clean up kikuyu in the autumn gives better winter and spring pasture growth rates. Three treatments are comparing the use of breeding cows, use of a mulcher or grazing with finishing stock.



Use early winter nitrogen to change pasture species:



This trial aims to determine whether a late autumn or early winter nitrogen application can accelerate the natural change from kikuyu to ryegrass dominance that occurs during the winter months. Early results suggest that this is the case, and the nitrogen application

may encourage ryegrass to grow through kikuyu pasture - increasing pasture production during winter and spring. This is being further tested, particularly comparing the response in low vs high fertility soil.

Graze and oversow ryegrass with nitrogen:



Temperate grasses being established from seed oversown into a kikuyu dominant sward can struggle to compete with kikuyu. One theory is that the very high C:N ratio of rotting kikuyu may immobilise nitrogen in kikuyu residue, effectively robbing the establishing seedlings of nitrogen.



This trial looks at whether nitrogen applied shortly after oversowing can improve pasture establishment and lead to more animal production through the spring period. The trial utilises multiple mobs of animals to monitor actual animal performance gains from a combination of nitrogen and annual grass treatments. In addition to animal performance data, pasture growth and quality are monitored. The cost effectiveness of this will also be determined.

TIP OF THE MONTH

Farmers will be noting a drop in pasture cover, and know that growth rates will be lower over winter. Planning is crucial to manage through to spring:

Keep your rotation length as long as possible without causing significant pugging damage. Giving stock regular shifts behind an electric wire within a paddock will ensure they get some fresh feed each day and help encourage better pasture regrowth.

Remember that the N-response on kikuyu dominant paddocks will be much lower at this time of year.

AVAILABLE NOW!

Northland Kikuyu Action Group has recently published a series of booklets covering baseline information on kikuyu and management of kikuyu dominant pastures. The range of topics includes history and agronomy, fertilizer requirements and management. They are available in hard copy, CD or from www.enterprisenorthland.co.nz (follow the links to the pastoral publications section).

Impact of Kikuyu pasture dominance on Sheep & Beef Production modeled.



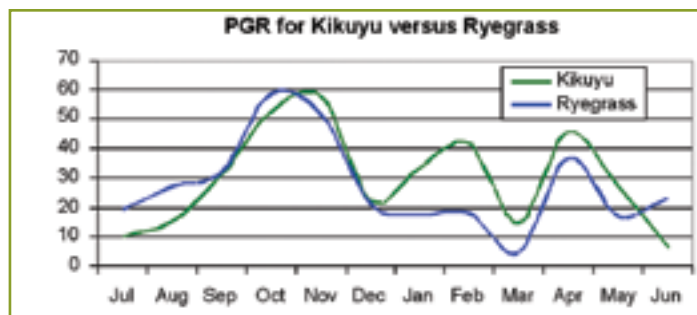
Thanks to a grant from Meat and Wool NZ's FITT fund and considerable input from Murray Jagger, KAG has finished a two year

project that monitored and modeled pasture growth rates to compare the performance of kikuyu relative to ryegrass pasture. Pasture growth, species and nutritional data was collected from a ryegrass and a kikuyu dominant paddock over 2005/06 and 2006/07. The first year had good summer rainfall, while the second year was summer dry, severely affecting the ryegrass growth.

A key result of the project was that farmers should be cautious about applying policies developed on ryegrass systems to kikuyu dominant pasture!

Impact on Pasture production:

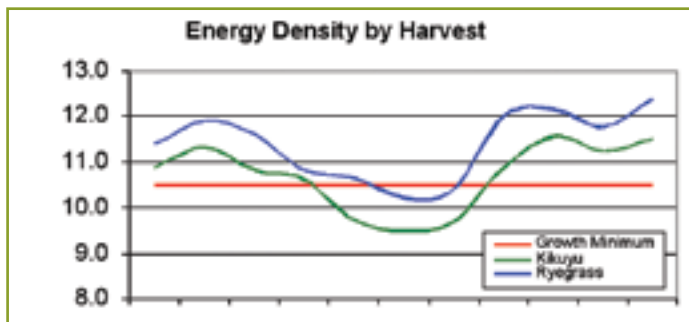
Diagram 1: Pasture Growth Rate of Kikuyu & Ryegrass Paddocks (average of 2 years data)



On average the kikuyu grew around 8% more pasture. Kikuyu tended to grow more pasture in the summer and autumn, but less in the winter and early spring.

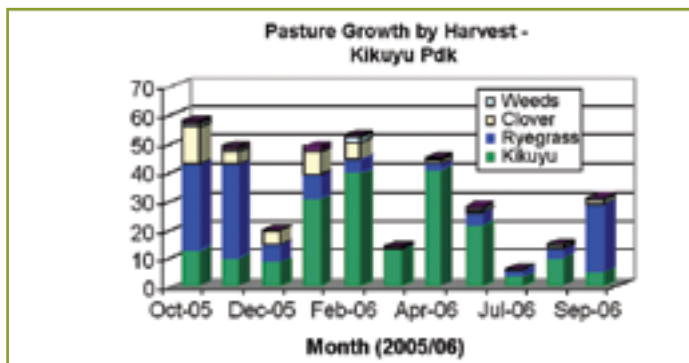
However energy was consistently lower in the feed samples taken from the kikuyu area as outlined in Diagram 2. Feed quality in the kikuyu sample dipped below 10.5 MJME/kgDM for considerably longer than the ryegrass sample - even in a system where every possible step was taken to maximize feed quality. It is noted that while the ME of ryegrass pasture will be reasonably consistent across farms, ME of kikuyu is likely to have a far greater range, depending on pasture management and other factors. Many kikuyu dominant pastures would be up to a whole point lower, affecting total ME produced and animal performance.

Diagram 2: Energy Density of Kikuyu & Ryegrass samples (Year 1 data)



Species fluctuated significantly in the kikuyu sample as outlined in Diagram 3. The natural emergence of temperate grasses in the spring is an important part of managing kikuyu. Previous work has shown good autumn control of kikuyu will encourage early growth of ryegrass in the winter and spring.

Diagram 3: Seasonal Pasture Species Changes in Kikuyu Sample



Impact on Animal Production

This data was used in the farm modeling program Farmax simulating two typical Northland sheep and beef policies: a breeding farm and a trading farm. The seasonality of pasture growth led to significant differences between pasture species in production and profit. The impact of kikuyu was greater on trading systems than breeding ones. Modeling indicated the following effects on the kikuyu farms:

Breeding Farm

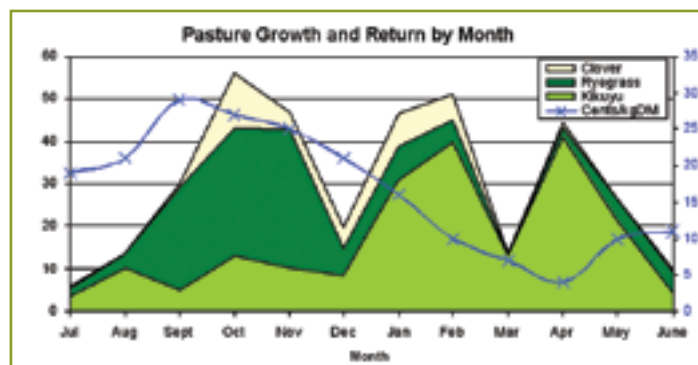
- Underfeeding in early lactation means lighter lambs and calves at weaning
- Lighter lambs at weaning meant fewer finished before Christmas when prices are higher
- More stock need to be retained to control pasture quality during autumn
- 4% less production from kikuyu (204 kg carcass/ha versus 213 kg carcass/ha)
- 22% less profit (gross margin \$452/ha from kikuyu versus \$583/ha from ryegrass)

Trading Farm

- Less winter liveweight gain
- More stock retained through the autumn to manage feed quality
- 14% less production from kikuyu (391 kg/ha vs 454 kg/ha)
- 38% less profit (\$553/ha vs \$901/ha)

Despite relatively small differences in production, there was a major difference in profitability, due to the seasonal fluctuations in prices for both store and finished stock. Procurement pressure means prices tend to be highest in the spring and lowest in the winter. This trend of pasture production and seasonal value of feed are reflected in Diagram 4 below:

Diagram 4: Seasonal Pasture Growth and Seasonal Value of Pasture



Because Kikuyu is a pasture species with aggressive autumn growth and poor spring growth more stock have to be retained through the autumn to manage pasture quality as returns from livestock fall.

Farmax modeling was also used to determine management practices which fit well with the kikuyu growth pattern:

- Later calving cows
- Increase feed demand during autumn by retaining more stock longer
- Using more supplementary feed during the winter with breeding stock
- Use long winter rotations (>70 days), with high priority stock (replacements of finishing stock) grazing ahead of lower priority stock (such as breeding cows and ewes or store stock)
 - Encourage emergence of temperate grasses
 - Help build pasture covers
 - Target preferential feeding of high priority stock

These principles are designed to be used alongside existing kikuyu management tools such as mulching, oversowing and regrassing as part of the kikuyu management toolbox.

Kikuyu in Australia - a Kikuyu-Based System Working Well

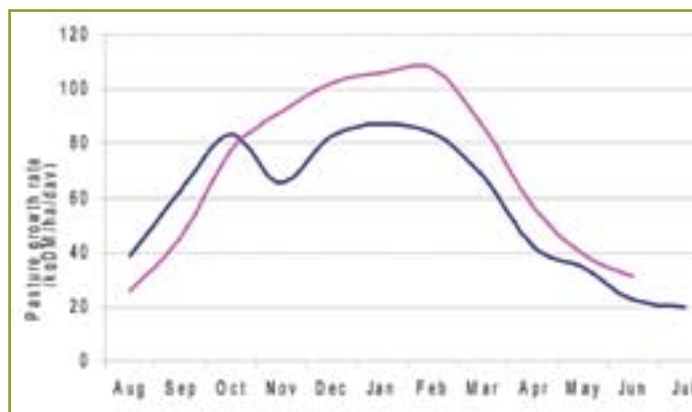
Cameron Clark, scientist with Dairy NZ made a presentation to the recent Northland Pastoral Development Group conference. A high proportion of pasture on coastal New South Wales and Southern Queensland is kikuyu. It is also distributed throughout the higher rainfall regions.

While Cameron recognised that the findings of Australian research and aspects of the MacLaughlin's system cannot be directly replicated in Northland, some of the components maybe usefully transferred to increase Northland farm profit.

Case Study: MacLaughlin's Farm in Western Australia

Mike MacLaughlin's farm in Brunswick, Western Australia (WA) milks 104 Jersey cows on 12.5 ha of irrigated land, producing 2,687kg milksolids/ha from an estimated 27.3t pasture DM/ha (grain supplement + pasture = 28.8t DM/ha) consumed. The base pasture on this farm is a mix of kikuyu, clover and a few weeds (dock) which is annually oversown to ryegrass in autumn. Pasture growth is high:

Pasture growth rate for the 2003/4 (blue) and 2004/5 (pink) seasons.



The MacLaughlin's system focuses on growing as much pasture as possible and subsequently finding a cow to convert what is grown to product. This is as opposed to developing a cow to produce as much milk as possible and then trying to feed it. So, in Australia, this farm is running against the norm.

They have very high stocking rates with comparatively low per cow milk yields to utilise the high quantity of a lower quality feed. It was to achieve high pasture growth rates relative to ryegrass, irrespective of quality, that Mike MacLaughlin was drawn to kikuyu.

Eliminating Kikuyu: KAG Cloverbase Project.

Graeme Piggot continues to investigate sowing clover pastures on hill country as a means of controlling kikuyu grass reinvasion and increasing the nutritive value of the pastures with support from DairyNZ. KAGCloverbase pastures are a sowing of white clover, red clover, plantain, and ryegrass.



Successful sowing requires drilling shallow into bare ground. Monitoring conducted over the last 18 months on dairy farms at Waiharara, Umawera, Kerikeri, and Ruakaka shows that the yield potential of these pastures is as good as standard grass pastures.

As expected kikuyu grass has reinvaded. Can these pastures be resown by spraying with Roundup and re-drilling? Respraying/resowing has been conducted at Kerikeri in autumn 07, at Waiharara in winter 07, and at Ruakaka this autumn. At Umawera the focus of monitoring is towards problems of weed control in clover pastures and whether pasture yield on clover pastures can be maintained without fertiliser nitrogen.

**More information on this project is available from:
Graeme Piggot - epi@igrin.co.nz**

Northland Dairy Development Trust looks to quantify the effect of pasture on milk production and farm profitability.

In Northland, average pasture production on dairy farms varies between 9 to 14 t DM/ha, although 17 to 19 t DM/ha can be grown with C4 grasses (NARF data, unpublished), and incorporation of forage crops can produce substantially more. A number of pasture species traditionally contribute to milk production including temperate ryegrass, white clover, and tall fescue and the subtropical C4 grasses - kikuyu, and paspalum. Poorly managed kikuyu dominant pasture results in pasture with a low metabolisable energy (ME) and digestibility. However, well-managed C4 grasses can maintain adequate ME values relative to ryegrass for the same period of the

year. Milk production from a kikuyu based farm in Northland may be $\pm 20\%$ that of a ryegrass farm in the same district (Andrewes & Jagger, 2003) but to date no comparison of the two systems on the same farm has been carried out. The opportunity exists to measure productivity of 'mechanically managed' kikuyu pasture and comparing this to kikuyu that is managed by non-mechanical means. An all ryegrass farmlet will be used as a control.



The project will commence in July 2008 and continue for two years in the farmlets collating base line data. It is envisaged that after two years, complementary forage crops or varying pasture species will be incorporated into the farmlets to determine how we can best improve on both productivity and profitability in these three systems. The work is funded by DairyNZ and will be carried out on the Northland Agricultural Research Farm (NARF) in Dargaville under the management of the Northland Dairy Development Trust (NDDT).

Regular updates will be supplied by email and if you would like to be included on the mailing list or have any questions or comments regarding the project please contact Kate Wynn on (0274) 804 305 or kate.wynn@dairynz.co.nz .



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