Northland Pastoral Extension: Popular Summary

Production – Winter Growth Research

NORTHLAND NATURALLY
FIRST REGION OF NEW ZEALAND

Sustainable Farming Fund

Summary of Key Findings

- Mild winters in Northland mean relatively good pasture growth rates compared with other parts of the country
- Nitrogen can be a limiting factor to growth
- Kikuyu grass growth rates are low in winter and spring
- Successfully established temperate grasses do improve seasonal and annual production from kikuyu dominated pastures
- Sub-soiling on podzolized soils increases pasture production
- Winter pasture management has a massive impact on animal production

Mild winter opportunities

A three-year trial at Punakitere (10km west of Kaikohe) was run on 32 paddocks of 0.4ha stocked at different rates with small groups (average 12) of Angus steers. The average start weight in late-April-early May each year was 186kg LW/head. Each stocking rate had nitrogen versus no nitrogen comparison. Applications were 58 kgN/ha after the animals had left the paddock, repeated three times. Initial rotation length was 40 days; thought to give the most efficient use of applied nitrogen. Steers were weighed after each rotation. Total grazing time averaged 180 days each year.

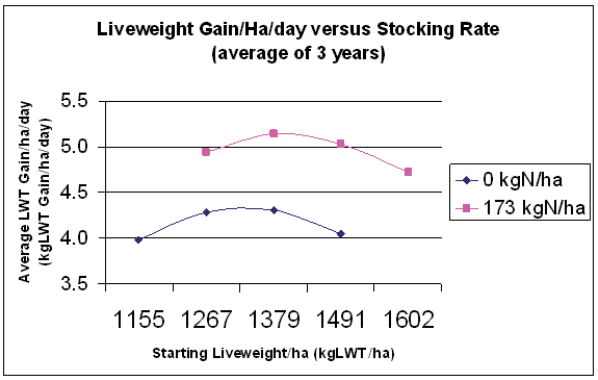
Stocking Rate		Steers per Group	
Steers/ha	LWT*/ha	No Nitrogen	Nitrogen
6.2	1153	10	
6.8	1265	11	11
7.4	1376	12	12
8.0	1488	13	13
8.6	1600		14

** LWT/ha is starting liveweight/ha (kg LWT/ha)*

Results

In all three years there were highly significant increases in liveweight gain per head and per hectare from using nitrogen and significant reductions in liveweight gain per head by increasing stocking rate. Within years there was a general trend for liveweight gain per hectare to increase

with stocking rate to a maximum, then decline with any further increases in stocking rate. The stocking rate at which maximum liveweight gain occurred was generally higher in the nitrogen treatment group than in the treatment without nitrogen:



Kikuyu grass responses

Kikuyu grass is a sub-tropical pasture species which has low growth rates in Northland during winter and spring. Temperate grasses can be introduced into kikuyu swards to boost cool season production. Keys to successful establishment include:

- Removing the dense kikuyu mat before sowing
- Kikuyu should be suppressed using herbicide, especially when oversowing seed or drilling in early autumn
- Perennial temperate grasses are more cost effective than annual grasses by spreading establishment costs over a greater number of years.
- The kikuyu mat needs to be removed each autumn by intensive grazing or mechanical means if the temperate species are to express their winter and spring potential

Nitrogen and cutting interval

A project examined the effect of 2, 4 and 6 weekly cutting intervals at four rates of nitrogen (0, 120, 240, 480 kg N/ha/year) on kikuyu swards at three sites in Northland (Peria, Dargaville and Matakohe). The sites were monitored for 96 weeks and nitrogen was applied after each pasture cut. Pasture species was assessed using point analysis in late winter of the second year, at all other periods the sward was dominated by kikuyu.

Key Highlights - Nitrogen

- Pasture growth rates were highest in the autumn when kikuyu was the dominant pasture species
- Pasture growth rates were lowest in the spring when swards were a mixture of Poa annua and kikuyu
- At Peria nitrogen responses were linear and consistent through the project
- At Dargaville and Matakohe N responses were consistent and linear through the winter and spring, but inconsistent during periods of water stress or low temperature
- Increasing nitrogen applications resulted in a marked decrease in clover content
- Increasing nitrogen applications increased the proportion of Poa annua.

Key Highlights – Cutting Interval

- Longer regrowth intervals resulted in greater herbage yields of kikuyu
- Longer regrowth intervals gave the greatest response in spring and autumn and the least in winter and summer.
- The effect of cutting interval was greater than the effect of N at the Dargaville and Matakohe sites
- Nitrogen content in the mixed herbage decreased with extended cutting interval

Extending the cutting interval increased clover content and decreased kikuyu content

Summary and Conclusions

- From April – July growth rates declined by 3.4 kgDM/ha/day per 1°C reduction in temperature
- Yields of kikuyu were clearly influenced by rate of nitrogen application, cutting interval and climatic conditions at each site.
- Frequent cuttings reduced the potential yield at all sites
- Frequency of cutting generally had a greater effect than nitrogen application except during the winter
- Pastures are less responsive to cutting frequency as the rate of nitrogen increases
- The optimum period to use nitrogen to increase pasture yield is in the late winter
- At other times, rotation length will probably have more impact on herbage yield of the kikuyu component than small dressing of nitrogen
- This trial indicates grazing management (rotation length) can be as effective as nitrogen to increase pasture growth. Farmers looking to match feed supply and demand should be looking to utilise rotation length to maximise pasture growth. Nitrogen application in the late winter period is an effective tool to increase pasture growth rates.

Sub-soiling Gumland soils pays off

Two 0.5 ha paddocks on Wharehoke soil (a gumland or podolised soil) were drained using 65mm Novaflo 27-34 metres apart at 800mm depth, backfilled with scoria. The paddocks were "sub soiled" (Shakaerator) to a depth of 0.5m and at 1 m spacings above and perpendicular to the subsurface drain. The gradients of the channels ranged between 3 – 6% due to changes in slope. The sub soiling was repeated each autumn. Pasture production, pasture composition, root growth/ distribution and water table depth were all monitored and compared with control paddocks. Two adjacent undrained paddocks were used as the control. Trial paddocks were grazed with sheep.

Conclusions

- Sub-soil drainage on podzolised soils does increase pasture production (16 – 20% more pasture production)
- Most extra pasture production occurred in the winter
- Sub-soiling resulted in 30% more roots being present in the winter
- Most additional roots were present

in the upper soil profile 100 – 300mm
- Sub-soiling must be repeated each autumn (1 – 2 hours tractor time/ha) to offset damage from pugging during winter grazing
- Gradients should be less than 8% to reduce the risk of scouring

Winter Management

A trial was carried out at Whatawhata on hill country similar to much of Northland. Ewes were assigned to one of 8 different feeding levels (low or high) during mid pregnancy, late pregnancy and lactation. Feeding level was manipulated by post grazing residuals. Among the conclusions applicable to Northland were:

- Underfeeding in lactation has a greater impact on ewe and lamb weaning weight than underfeeding in mid or late pregnancy
- Restrict ewes during pregnancy to build pasture covers
- Don't underfeed ewes in lactation
- Underfeeding in pregnancy has little impact on lambing percentage
- More regular shifting in mid pregnancy helps build pasture covers but does not improve final ewe liveweight
- Ewes set stocked four weeks prior to lambing had lower pasture cover at lambing and weaned less liveweight than ewes set stocked at lambing
- Use rotational grazing to build winter pasture covers and don't set stock until as close to lambing as possible
- Having a long rotation during pregnancy results in better feeding during lactation and better weaning performance
- Rotationally grazing ewes and lambs after lambing helps to build covers, but the rotation must be short to maintain pasture quality (15 – 20 days)

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A project co-ordinated by the Northland Pastoral Farming Development Group.
The complete research stocktake on Winter Growth Research in Northland is on the Enterprise Northland website: www.enterprisenorthland.co.nz