Northland Pastoral Extension: Popular Summary

Pasture growth rates in Northland

NORTHLAND NATURALLY
FIRST REGION OF NEW ZEALAND

Sustainable Farming Fund

Summary of Key Findings

- Monthly pasture growth rates in Northland vary by more than 100% from year to year. Therefore regular monitoring is essential.
- Most feed budgets are for the period May to September when the average pasture growth rates can be more consistent from year to year.
- But a wet winter on the wet clay soils may cause pugging and subsequent spring pasture production can be down 25%.
- Climate has more effects on pasture growth than soil types and location. However in the Far North the autumn peak is better and the winter growth rates higher.
- Variations in contour affect pasture production.
- More autumn and winter pasture production from good soil fertility.

Variability

Climate variability shows out strongly in recorded winter and spring pasture growth rates in Northland. For example, on a Redhill sand complex at Otakanini with medium soil fertility, measurements over a decade showed big differences from year to year. The average estimate of winter production is 1870kg pasture dry matter per ha for the months May June and July. The range in two years out of three is from 1370 to 2370 and the actual range in the long run is from 1060 to 2680. So for feed budgeting purposes any reasonable figure can be taken and a two weekly monitoring of indicator paddocks is needed to determine actual pasture growth for that period and the feed budget adjusted accordingly.

Example: Dargaville Research Farm rainfall data (Kaipara clay soils)

	1976	1977	1978	1979	1980	1981	1982	Av	Range
May	15	20	30	20	36	36	27	26	15-36
Jun	20	16	25	19	15	18	19	19	15-25
Jul	17	20	18	13	14	18	14	16	13-20
Aug	35	18	16	12	22	5	43	22	5-43
Sep	22	33	40	17	27	36	45	31	17-45
Av May-July	17	19	24	17	22	24	20	20	17-24
Av May-Sept	22	21	26	16	23	23	30	23	16-30

Note: The monthly data shows tremendous variation from year to year but for a feed budgeting period from May to September there is less variation. In the seven years there was one year with poor growth rates and likewise one year with very good growth rates and for the other five years the average monthly growth rates were quite consistent.

Ryegrass and Kikuyu compared

Pasture cuts at Dargaville over five years showed these differences between ryegrass and kikuyu grass-dominant pastures, in kilograms of dry matter per hectare.

	Ryegrass	Kikuyu	Diff
May	38	42	+10%
Jun	32	27	-16%
Jul	30	23	-23%
Aug	41	32	-22%
Sep	65	60	-8%
Oct	71	71	
Nov	78	80	+2%
Dec	66	69	+4%
Jan	43	58	+35%
Feb	27	57	+111%
Mar	33	70	+112%
Apr	28	52	+86%
Total	16900	19600	

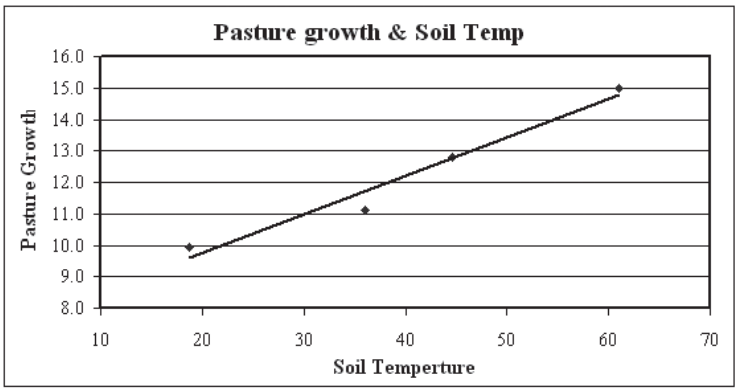
During the winter months June to August the kikuyu pastures produced 20% less than the ryegrass paddocks and during the spring September to December about the same but in the summer and autumn period the kikuyu out-produced the ryegrass paddocks by 85%. The total annual dry matter yield in favour of the kikuyu-dominant paddocks was 16%. On this property effort was made to control the kikuyu pastures in the autumn by grazing and mowing to induce ryegrass dominance during the winter. This was achieved in most years so that spring growth rates were similar but the kikuyu dominance in the autumn still resulted in poor winter production.

Similar data was collected from a dairy farm on the east coast with medium to high fertility where total pasture production from the kikuyu pastures was about 9% more than the ryegrass swards with 16% less growth during the winter and early spring and almost 50% more during the summer and autumn period.

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Rye	15	12	22	31	33	57	51	38	30	31	17	20
Kik	32	18	18	17	28	46	62	34	36	38	30	28
Diff	+113%	+50%	-22%	-13%	-15%	-16%	+21%	-10%	+20%	+29%	+41%	+40%

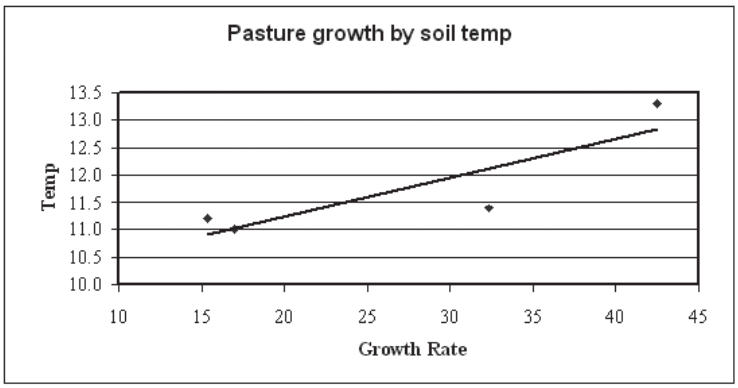
Winter-Spring growth rates

The graph to the right is for the period July to October inclusive on a Hukerenui farm and compares pasture growth rates with changes in soil temperature. On average for this period for each increase in soil temperature by 1 degree C pasture growth rates increase by 8 kg per hectare per day. The same relationship applied for a Dargaville farm.



Bay of Islands pasture growth rates

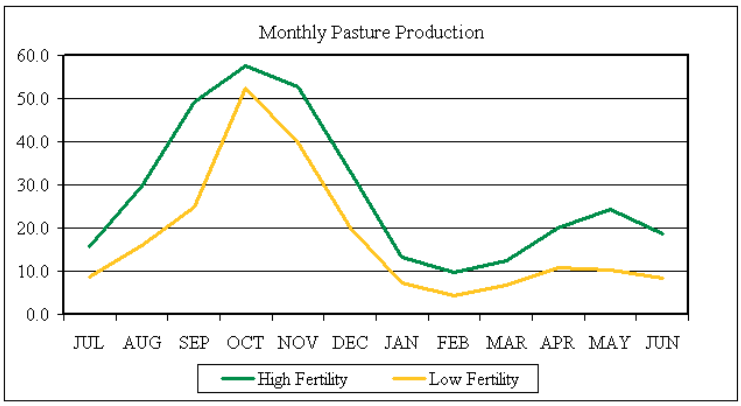
Monthly pasture production was collected over eight years from a dairy farm near Kerikeri with good levels of soil fertility, the Olsen P levels ranging from 15-35 and the soil type mostly a mature yellow brown earth soil.



Pasture growth rates from July to October inclusive increased by 12kg per ha per day as the soil temperature increased by one degree Celsius.

Waiotira Sheep & Beef Farms

Monthly pasture production for three years collected from two study farms during 1989/90 to 1991/92. One property with an Olsen P level of 10 was classified as the low fertility property and the second with Olsen P levels of 20 as the high fertility property. The average pasture production data for the three seasons for the two properties is compared.



The high fertility property produces 60% more grass in total but of more significance is the difference in the shape of the feed wedge. For the low fertility farm the grass growth has a pronounced peak with 66% of total grass grown during the four months September to December. For the high fertility farm it is 57% and the grass growth curve is flatter. On high fertility farms the pasture growth rate is 90-100% more during the autumn and winter months than on low fertility farms.

Contour variation

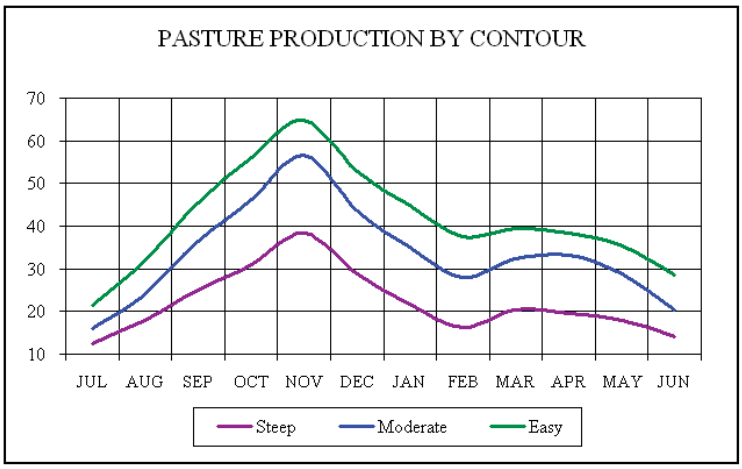
During the period 1994/95 to 1997/98 data was collected from a sheep and beef property at Maungaturoto and monthly pasture production was compared between easy, moderate and steep contour as follows. The soil type was mostly a yellow brown earth.

The steep country was defined as land where stock tracks were evident and easy land being capable of cultivation with two wheel drive tractors and moderate country was in between the

two. A trained technician did the assessments of the contour. On average the steep country grew 53% of the grass that was grown on the easy country and the moderate country grew 81% of the grass compared with easy country. Soil test information indicated that the Olsen P levels were similar across all sites where the cages were located. The biggest difference between the contour classes was during the summer months January and February and simply reflects differences in soil moisture levels.

Monthly growth rates:

	STEEP					MODERATE					EASY				
	94/95	95/96	96/97	97/98	AVG	94/95	95/96	96/97	97/98	AVG	94/95	95/96	96/97	97/98	AVG
JUL	12	10	14	14	13	17	12	16	19	16	23	17	24	22	22
AUG	14	23	18	17	18	18	30	24	24	24	25	32	37	33	32
SEP	16	28	32	24	25	25	38	45	38	37	30	48	55	49	46
OCT	23	35	35	31	31	41	45	49	50	46	45	62	56	61	56
NOV	43	47	36	28	39	65	56	54	52	57	71	62	62	64	65
DEC	11	50	34	20	29	14	63	58	39	44	23	70	66	52	53
JAN	12	36	25	14	22	19	44	48	29	35	25	54	63	38	45
FEB	16	23	16	10	16	24	30	38	20	28	30	38	58	24	38
MAR	22	13	27	20	21	32	22	40	36	33	38	30	43	47	40
APR	23	14	18	23	20	34	31	36	32	33	41	32	39	41	38
MAY	20	15	20	17	18	31	26	33	25	29	37	33	38	33	35
JUN	9	11	22	14	14	12	17	31	22	21	20	27	38	29	29
AVG	18	25	25	19	22	28	35	39	32	33	34	42	48	41	41
TOTAL	6722	9277	9034	7057	8022	10098	12593	14357	11741	12197	12410	15360	17611	14995	15094



Pasture growth under irrigation

Dexcel data from three Northland farms (Wellsford, TeHana and Kerikeri) over seven years comparing irrigated with non-irrigated pastures showed the extra pasture production due to irrigation for the five months December to April inclusive ranged from 11 to 22 kg per ha per day with an average of 15kg/ha per day over the three sites. This is an extra 3800kg pasture dry matter equivalent to about an extra 250kg milksolids per ha.

Compiled by Colin Page, edited by Hugh Stringleman
A project co-ordinated by the Northland Pastoral Farming Development Group.
The complete research stocktake on Pasture Growth Rates in Northland is on the Enterprise Northland website: www.enterprisenorthland.co.nz