

# Northland Pastoral Extension: Popular Summary

# Forage Cropping



## Summary of Key Findings

Research work confirmed the advantages of growing forage crops:

- High-quality feed in summer when pastures are low to very low quality.
- Extra total feed in summer.
- Feed free from pasture toxins – eg toxins causing facial eczema, ryegrass staggers, zearalenone (infertility in sheep).

## Feed Quality

The most common forage crop in Northland, brassicas, have high to very high feed quality. A 1998 survey of sheep and beef pastures showed forage crops had 10.9 metabolisable energy (ME), whereas typical pastures had 8.4 ME in the summer.



## Feed Quality Levels and Animal Growth

Crop	Energy level (ME)	Quality
Turnips	12.5	Very high
Spring pasture	12.0	Very high
Summer pasture	9.0	Low
Good kikuyu	9.1	Low
Poor kikuyu	7.5	Very low

The difference between animal growth on Northland low-quality pasture and forage crops is huge.

Stock class	Liveweight	Feed energy level (ME)	Potential daily growth rate
Wether lambs	25	8.4	75 gm/day
	25	10.9	290 gm/day
Weaner Friesian bulls	130	8.4	0.1 kg/day
	130	10.9	1.7 kg/day
18-month steers	400	8.4	0.5 kg/day
	400	10.9	2.7 kg/day

Impact of poor feed quality greater on younger animals than on more mature animals.

## Brassica Yields 1970s to 1980s

Yields from spring sowings were, on average, 5–12 tonnes of DM/ha in climatically favourable years.

### Kaikohe silt loam sown 1 November 1979

	Harvested date and yield		Total yield (kg DM/ha)
	9 February 1978 (kg DM/ha)	12 April 1978 (kg DM/ha)	
Kale – medium stem	3800	1300	5100
Rangi rape	5400	1700	7100
Wairoa brassica	4600	2700	7300
Yorkglobe turnips	6500	0	6500



### Peat and clay soil sown 9 October 1979

	Harvested date and yield		Total yield (kg DM/ha)
	21 February 1980 (kg DM/ha)	8 April 1980 (kg DM/ha)	
Kestall kale	9100	800	9900
Rangi rape	7100	600	7800
Wairoa brassica	8800	600	9200

Production of brassica crops can be extremely variable – from total failures to superb yields. On a sand soil at Otakanini (near Helensville) from a 19 October 1979 sowing, the three brassica crops averaged 23 600 kg DM/ha up to mid-April.

## Northland Dairy Survey

Northland dairy farms were surveyed in 1994–1995 as part of a nationwide survey.

District	Number of farms	Brassica crop yield (kg DM/ha)	December rain (mm)
Far North	5	4330	?
North Whangarei	8	7070	9
South Whangarei	13	8190	9
Kaipara	7	7500	5
Wellsford	15	5470	12
Average result – Northland		6620	
Average results – New Zealand		7360	

A major factor limiting yields (to what were just moderate levels) was the extremely dry month of December. Many crops looked disastrous in mid to late December, but recovered reasonably well from excellent rain in early January.

## Factors Affecting Crop Yield

The two most important considerations for the majority of situations are:

- Rainfall or soil moisture.
- Nitrogen levels – either of the soil or amounts applied.

Low soil moisture can be partially offset by choice of crop, but good soil moisture is still needed to achieve good crop yields.

## Kaitaia Silage Crop Yields 1973–1974

Soil type	Germination %	Forage sorghum yield (kg DM/ha)	Maize yield (kg DM/ha)
Clay	20	Failed	Failed
Peat	50	22 700	22 300
Podzolised sand	60	10 300	11 600

With just 50% of normal rainfall from October to March, the poorest soil (podzolised sand) was also the driest, and suffered worst from very low soil moisture. Spray and direct drilling establishment worked well on the peat and sand, but failed on the clay. Root penetration in very tight clay was very poor – roots ran along the base or bottom of the disc cut.

## Nitrogen

While good base soil fertility is important, so is the application of nitrogen – a deficiency in nitrogen is the most common soil nutrient problem limiting crop yields.



## Crop Yields in Kaitaia District

Wairoa brassica:

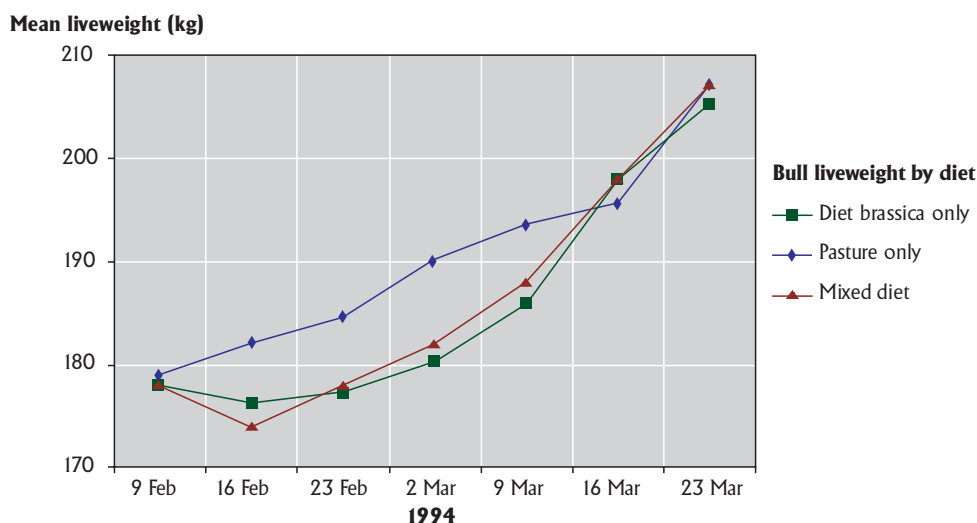
- Forage nitrogen level just 2% – very poor crop yield (3000 kg DM/ha).
- Nitrogen level 4.4% (double that of the poor crop) – moderate crop yield (5500 kg DM/ha).

For a crop of forage oats, monitoring showed soil nitrogen levels were the major difference between paddocks with an average yield (4400 kg DM/ha) and those with an average yield of 13 300 kg DM/ha in the best areas.

## Stock Adjustment

Weaner bulls showed short-term weight loss at commencement of feeding Wairoa brassica – losing weight for one week and taking another week to start growing again.

- Weaner bull growth rates averaged 0.65 kg/day when fed brassica over a 6-week period.
- Weaner bulls, as do other stock, need to graze forage crops for longer than 4–6 weeks to compensate for the first 2-week ‘adjustment period’.
- Utilisation of Wairoa brassica very low – only 5–12% eaten when fed as a sole diet, just 20–25% used when fed as a mixed diet with pasture.
- Initial depression of liveweight gain can be eliminated if brassica comprises less than 33% of total daily intake.



During the 6-week period February–March, the weaner bulls were given extremely high feed allowances.

Bulls on the pasture-only diet grew very well (average of 0.72 kg/day), but this was an artificial situation resulting from the trial design (pre-graze of pasture was 7500 kg DM/ha and utilisation was very low at 30–35%).

A major negative from the very high pasture pre-graze was a very high dead-matter content (35%). A very good clover base (26–30% of pasture) would not have been enough to balance the high dead-material content in terms of offering very high-quality feed from the pasture.

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A project coordinated by the Northland Pastoral Farming Development Group  
The unabridged version of Research Stocktake – Forage Cropping is available on the  
Enterprise Northland website [www.enterprisenorthland.co.nz](http://www.enterprisenorthland.co.nz)