

These trials are part of a comprehensive programme undertaken to measure the effect of the LessN system on Nitrogen fertiliser response in pasture.

- To date there have been 51 fully replicated trials conducted in New Zealand.
- 10 Trials have been conducted by leading crown research organisations
- 41 have been conducted by Donaghys scientific team or independent agronomy contractor, Grassworks.
- The trials conducted by Donaghys have been audited byASUREquality, who reported that “the adopted trial design and statistical analysis are scientifically robust”.

Four trials (Three independent and one Donaghys) returned insignificant response against control for both Nitrogen alone and the LessN system.

Mean of 46 trials with N response

Trial	Dry Matter Kg / ha / day				Nitrogen Response		
Days	Control	Urea 40	Urea 80	LessN 40	Urea 40	Urea 80	LessN 40
24	39	42 +	58	59	10.1 +	12.3	25.4

Client Report

Pasture Trial 2007

Prepared for:

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INTRODUCTION

The brief was for [REDACTED] to undertake an evaluation of the product LessN3 supplied by Donaghys Industries LTD and compare relative dry matter yields to commercial urea. The pasture parameters that were sought were a newly sown traditional perennial ryegrass / white clover pasture with good soil fertility and no recent history of applying urea or DAP. The trial was to be conducted in autumn 2007.

METHOD

The trial was undertaken on the beef farm of [REDACTED] [REDACTED] Okaihau, Northland. Two sites were selected on a free draining volcanic soil that matched the grazing rotation. Site 1 sloped towards the east and Site 2 was flat with a slight slope to the West.

1. The soil fertility status was checked by sampling prior to product application and repeated at the finish of the measurement period.
2. Pasture composition was determined by sub sampling with hand shears prior to the trial commencing, during the measurement period and at the conclusion.
3. Dry matter (DM) yield was measured prior to the product application. Both sites were then mown to an even height by a tractor powered rotary slasher. DM yields were assessed using a Jenquip Folding Plate Pasture meter (20 positions per strip) and a rotary mown strip of 5 meters. The green weight was recorded for the mown strip and a 100 g sub sample was oven dried to determine the dry matter percentage. Pasture residuals to ground level were recorded using the plate meter. Actual DM yield was to be recorded immediately prior to grazing, at 18 and 42 days (Site 1) and 20 and 31 days (Site 2) following product application.

TRIAL DESIGN

Each trial site consisted of 5 replications of strips 4m x 40m (160m²) of 3 treatments laid out in a randomised block design.

TREATMENTS

- Water (200 L/ha)
- LessN3 at 3 L/ha of product + 40 kg/ha of urea (dissolved in water)
- Urea at 80 kg/ha (dissolved in water)

SPRAY APPLICATION

LessN3 was supplied as a liquid formulation. Urea was dissolved in water obtained from the farm water supply. Sufficient product was mixed to enable 5 reps to be sequentially sprayed at 200 L/ha. A fixed 4 m boom spray was used for the spraying application by TAG Vegetation Control. Applications at Site 1 were made on 4 May 2007 and Site 2 on 18 May 2007.



Site 1 4 May 2007



Site 2 18 May 2007

RESULTS

I. Soil Fertility

The soil samples taken before the product application in each paddock, and after the final measurements in mid-June show some differences in the lab test results but would fall within the normal variation for paddock sampling and are unlikely to have been caused by the nitrogen or LessN3 applications (Table 1).

Table 1 Soil fertility results measured prior and at completion of the trial in 2007.

Site	Date	pH	Ca	P	K	S (SO ₄)	Mg	Na
1	4 May	6.5	16	39	9	12	24	8
	18 June	6.3	15	42	12	14	23	9
2	18 May	6.4	13	28	5*	11	17*	5
	18 June	6.1	12	31	6	12	15*	6

* values are below recommended optimum levels.

II. Pasture composition

The main species present in both sites was perennial ryegrass with equal amounts of red and white clover present at Site 1 (Table 2). At Site 2, which was not grazed between measurements, there was a trend for the white clover to have improved from 8% to 15% after the 31 days growth however statistical analysis showed this difference was not significant.



Table 2 Pasture composition at the start of the trial, and 18 and 42 days (Site 1) and 20 and 31 days (Site 2) after application of spray treatments.

Site	Date	%ryegrass	Clover		
			%red	%white	%other
1	3 May	95	2	3	1
1	22 May	95	2	2	1
1	15 June	93	2	4	2
2	18 May	83	5	8	4
2	7 June	81	5	9	5
2	18 June	71	7	15	7

Trial 1 - No significant differences at 5% probability between treatments.

Trial 2 - No significant differences at 5% probability between treatments

III. Dry Matter Yield

Site 1

There were no differences between plot strips immediately prior to product application with either trial. DM yield was not recorded for the water only treatment as spray damage was observed on these strips and measurements would therefore not have been valid. Pasture DM was measured for treatment plots by 'rising plate' to check yield following pre trial slashing and on 22 May and 15 June as well as to estimate residual under the mowing height. The residuals were similar for all treatments. Following the 22 May measurement the site was grazed by mature beef steers and uneven residuals mown. The relative DM yields measured by both techniques on the 22 May were 13% greater for LessN3 than Urea only (Table 3). This difference was only statistically significant for the plate method due to less variation using this method of measurement compared with measurement using the mower method.

Table 3 Site 1 yield (DM kg/ha) recorded on 22 May 2007

Treatment	Mower DM	Rising Plate DM
LessN3 + 40kg urea	2866	3081
80 kg urea	2534	2715
Statistical Significance	ns	*
LSD 5%	592	277

ns = not significantly different at 5% probability. * = statistically different at <5% probability (P<0.05).

For the 22 May data there is evidence of a difference between the LessN3 and Urea only treatments, with the LessN3 giving higher DM (P<0.05) (Table 3).

Table 4 Site 1 yield (DM kg/ha) recorded on 15 June 2007

Treatment	Mower DM	Rising Plate DM
LessN3 + 40kg urea	2663	2791
80 kg urea	2570	2367
Statistical Significance	ns	*
LSD 5%	432	375

ns = not significantly different at 5% probability. * = statistically different at <5% probability.

At the second measurement (15 June) there was an 18% advantage to LessN3 using the plate method and 4% using the mower strip (Table 4). The differences in the result recorded for the different methods may be attributed to the smaller area being sampled compared to plating the complete trial strip. For the plate yields, the difference in means between the two treatments was significantly different.

Site 2

As at Site 1, there was no evidence of DM differences between plot strips prior to application of the treatments. Growth was measured on 7 June and 18 June (Tables 5 and 6) with no pasture defoliation occurring between measurements.

Table 5 Site 2 DM kg/ha recorded on 7 June 2007

Treatment	Mower DM	Rising Plate DM
Water only	2081	2247
LessN3 + 40kg urea	2236	2285
80 kg urea	2158	2298
Statistical Significance	ns	ns
LSD 5%	606	328

ns = not significantly different at 5% probability.

Table 6 Site 2 accumulated DM kg/ha on 18 June 2007

Treatment	Mower DM	Rising Plate DM
Water only	2410	2494
LessN3 + 40kg urea	2849	2367
80 kg urea	2589	2515
Statistical Significance	ns	ns
LSD 5%	403	210

ns = not significantly different at 5% probability.

Treatments in the second trial were applied during a period of falling soil temperature and no product treatments gave statistical differences which we can report. The difference in LessN3 treatment was not significant due to large rep variation recorded during the second mowing.

SUMMARY

LessN3 as applied in these trials gave a DM advantage compared with urea only at one site but at the other site there was no response to fertiliser.

ACKNOWLEDGEMENTS

We gratefully acknowledge [REDACTED] for statistical analysis and special thanks to [REDACTED] for providing the farm trial sites.