

Future Forage Systems Project

Plantain Hub Notes Te Aute, 25th September 2012



Future Forage Systems - Background

The East Coast Future Forage Systems Project provides the opportunity to road-test a range of forage technologies such as lucerne, plantain and annual clovers – both as crops and on hill country. Where possible, this will consist of on-farm demonstrations where new options are benchmarked against existing farm practice. Once we understand how these alternatives perform locally, we can look at integrating them into farming systems.

The focus at Te Aute is to use plantain as high quality feed for the finishing of lambs.

Plantain at Te Aute - data to date

Establishment

Three similar paddocks (19 ha in total – pH 5.9, Olsen P 30) were sown with three different pasture mixes (Table 1) on 24th March, 2012. Black Tank (7.8 ha) was sown in ryegrass/clover, Duck Pond (5.4 ha) was sown in plantain/clover and North Hill was sown in a mixture of ryegrass/clover and plantain. In each case, the clover components (white clover, red clover, sub clover) and sowing rate remained the same. Because of the higher ryegrass sowing rate, the amount of seed sown in the ryegrass based pastures was greater (31-33 kg/ha) and more expensive (\$300/ha) than the plantain/clover mix (17 kg/ha and \$180/ha). Prior to establishment, pastures had been planted in a summer brassica crop (Hunter) and then fully cultivated and sown with a Great Plains disc drill along with 125kg/ha DAP. Fertiliser was applied aerially on the 18/6/2012 (90 kg/ha Urea) and on the 12/8/2012 (200 kg/ha DAP 13S).

Table 1. Establishment details

	Black Tank	North hill	Duck pond
Area	7.8	5.8	5.4
Treatment	Ryegrass/clover	Ryegrass/plantain/clover	Plantain/clover
Sowing rates (kg/ha)			
Ryegrass - Extreme AR37	20	20	
White Clover – Nomad	2	2	2
White Clover – Tribute	1	1	1
Red Clover – Tuscan	2	2	2
Sub Clover - Denmark	6	6	6
Plantain – Tonic		2	6
Weight seed/ha	31	33	17
Cost seed/ha	287	309	181

Pasture growth rates

Pasture growth rates were measured using exclusion cages and at the September cut, pastures were dissected into component species (Table 2). The plantain/clover pasture had the greatest clover content (25% clover) whereas the ryegrass/clover pasture had 19.6% clover and the ryegrass/plantain/clover had 6.9% clover. Whereas plantain comprised 72% of the sward in the plantain/clover pasture, it only made up 5.7% of the ryegrass/plantain clover sward and suggests the 20 kg ryegrass sowing rate has swamped the plantain. The plantain/clover pasture consistently had a lower dry matter percentage (~12%) than the ryegrass based pastures (~16%), making estimates of pasture dry matter more difficult. Plantain growth rates were also slower at the first cut but since then have been consistently better than the ryegrass based pastures (Table 3). From sowing to the 7th September, plantain/clover produced 12% more dry matter (~5500 kg DM/ha) than the ryegrass based pastures (~4930 kg DM/ha).

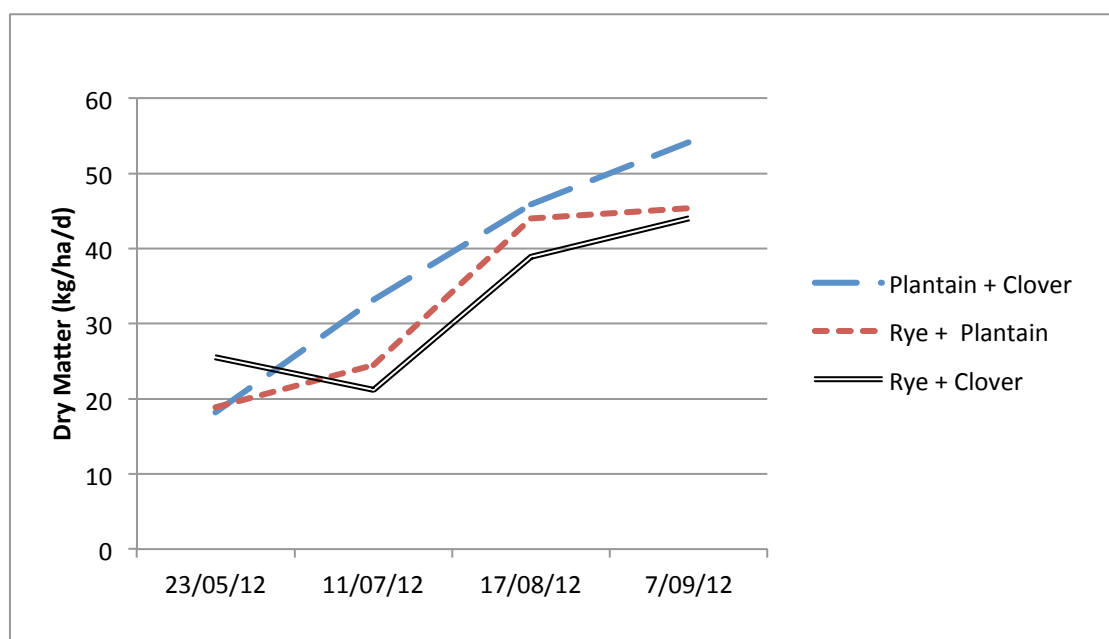
Table 2. Composition (%) of plantain and ryegrass based pastures (as at 7th September)

Treatment	Ryegrass/clover	Ryegrass/plantain/clover	Plantain/clover
Ryegrass	77.1	83.5	
Plantain		5.7	72.2
Red clover	3.9		3.1
White clover	2.6	0.6	6.8
Sub clover	13.1	6.3	15.2
Other grass			2.7
Weed		3.8	
Dead	3.3		

Table 3. Pasture growth

	Date	Ryegrass/clover	Ryegrass/clover/plantain	Clover/plantain
DM%	23/5/12	12.2	13.0	10.3
	11/7/12	18.6	20.0	15.2
	17/8/12	16.1	15.9	12.1
	7/9/12	17.2	16.5	11.5
Mean		15.8	16.3	12.3
DM (kg/ha)	23/5/12	1532	1133	1090
	11/7/12	1039	1199	1626
	17/8/12	1438	1628	1698
	7/9/12	924	953	1137
Total (5 months)		4933	4913	5551
Growth (kg DM/d)	23/5/12	25.5	18.9	18.2
	11/7/12	21.2	24.5	33.2
	17/8/12	38.9	44.0	45.9
	7/9/12	44.0	45.4	54.2
Mean		33.4	33.2	37.9

Figure 1. Te Aute DM production (23/5 - 7/9)



Lamb performance

A lamb grazing trial was started on the 18th July. Each paddock was fenced into a grazing rotation with three wire electric fences. Lambs were drenched with Duel and allocations made based on pasture covers and estimated pasture growth rates. The initial group of lambs were weighed (average 33.4 kg) and tagged and then re-weighed on the 18th July and the 10th August. Lambs grew significantly faster on the plantain/clover blocks (321 g/d) compared to 240 g/d for the ryegrass based blocks (Table 5). Additional lambs were added on the 10th August and again on the 5th September to control pasture growth. On the 5th September, all lambs were scored for dags. The criteria used was “would they have to be dagged if they were being sent for slaughter”. There was some evidence that lambs off plantain had fewer dags, with 31% of lambs off plantain and ryegrass/plantain pastures compared to 39% off the ryegrass pasture. On the 5th September lambs over 48 kg were drafted for slaughter and additional lambs added to each block. Of the lambs grazing the plantain block, 22% were drafted for slaughter, 11% off the ryegrass pasture and 14% off the mixed ryegrass/plantain pasture (Table 4). There were also significant differences at slaughter, with lambs off plantain having a higher dressing out percentage (47.3%) versus 45.5% for lambs off ryegrass based pastures. This happens on highly digestible feeds where a faster rate of passage results in reduced rumen contents. The end result was that lambs on plantain had significantly heavier carcass weights (Table 5). Yearling bulls were weighed and added to each block on the 14th September.

Over the 51 day trial period (18/7 - 5/9), the combination of higher liveweight gains and higher dressing out percentage meant that lambs on plantain/clover produced 128.5 kg of carcass weight/ha compared to 93.4 kg for lambs on ryegrass/plantain/clover and 90.4 kg/ha for lambs on ryegrass/clover. At \$5.75 per kg lamb carcass, this meant an advantage of \$200-\$220/ha for plantain/clover pastures (Table 5).

Table 4. Number of lambs grazed and lamb performance

		Ryegrass/clover	Ryegrass/plantain/clover	Plantain/clover
18/7/12	Lambs at start	93	67	63
10/8/12	Lambs added	81	62	57
5/9/12	Lambs killed	19/178	18/124	26/118
5/9/12	Lambs added	109	89	88
14/9/12	Bulls added	12	8	12
	Current lambs	264	200	182
	Current lambs/ha	33.8	34.5	33.7
	Current bulls/ha	1.5	1.4	2.2
The data below applies to a 51 day grazing period from 18/7 to 5/9				
	Grazing days (number/ha)	854	844	846
	Stocking rate (lambs/ha/day)	17.8	17.2	17.3
	Lamb growth rate (g/d)	238	245	321
	Total lamb LW/ha (kg)	203	207	272
	Total kg lamb LW/ha/day	4.14	4.22	5.54

Table 5. Slaughter data

	Ryegrass/clover	Ryegrass/plantain/clover	Plantain/clover
Carcass weight (kg)	22.50	22.09	23.36
DO %	45.7	45.2	47.3
Leg yield %	22.4	22.21	21.82
Loin yield %	15.56	15.59	15.40
Shoulder yield %	16.98	17.38	17.00
Carcass value	\$129.37	\$127.02	\$134.32

Summary

- Plantain pastures were established at a lower seed cost (\$100/ha cheaper) and produced more dry matter from autumn through to 5th September.
- Plantain based pastures had a higher clover content. Lamb growth rates were significantly higher on plantain/clover with more lambs drafted. This extra liveweight gain may have been due to the higher clover content.
- Lambs on plantain dominant pastures had a higher dressing out percentage, resulting in extra carcass weight per ha. This was a double whammy effect – better liveweight gain and a better DO% leading to a \$220/ha advantage over a 51 day grazing period.
- Sowing high rates of ryegrass with plantain suppressed plantain and clover growth.
- If a mixed pasture is desired, the challenge will be to establish the optimum mix of grass and plantain so that plantain and clover are not suppressed.
- With plantain, the big unknown will be on-going productivity and persistence.