Pastoral 21
Waikato site summary

Aim of the Waikato trial

- increase milksolids (MS/ha) from 900 - 1100 kg MS/ha/yr to 1100-1300 kg MS/ha/yr
- increase operating profit by $500/ha/yr
- decrease N leaching by 30%.

This was achieved by comparing a traditional Waikato "Control" farmlet, using standard farm management, with a "Future" farmlet using a stand-off pad, restricted N fertiliser and including grain in the diet.

The trial ran for five full lactations from 1 July 2011 until 31 May 2015.

Table 1: Farmlet designs for Control and Future farmlets (start date 1 July 2011) - Waikato.

	Control	Future
Stocking rate (cows/ha)	3.2	2.6
N fertiliser (kg N/ha)	135	60
Cow BW/PW (May 2011)	90/75	170/240
Cow live-weight (kg)	500	480
Replacements	21%	18%
Standoff/restrict grazing	No	Yes
Imported feed offered	Yes	Yes
Comparative stocking rate (kg LWT/t DM offered)	89	79
ProGibb	No	Yes

Key findings

Profit

At a milk price of $7.40, the Future farmlet had an operating profit $225/ha less than the Control farmlet, in a large part to not producing the extra revenue required to cover the standoff costs (operating, interest and depreciation cost) which were estimated to be $300 to $400/ha.

Production

Results from five full lactation seasons show that the future farmlet:

- Produced 4% lower MS/ha/yr compared to control farmlet
- Produced ~20% more MS/cow/yr than the control farmlet
- Is in the top 25% for milk produced in the Waikato region for similar farms over those years
- Achieved ~20 more days in milk than the control farmlet
- Grew 1.5t DM/ha/yr less than the control farmlet, mainly due to the reduced N fertiliser applied
- Pasture eaten was 1.25 DM/ha/yr lower than the control farmlet
- Consumed approximately the same per ha amount of supplement

Environmental results

Over four years the estimated N leaching from the future herd was 40% lower than the control herd (Table Two). Approximately half of the 40% decrease was from lower N inputs (reduced N fertiliser, reduced high protein(N) supplements; resulting in a lower stocking rate).

The other 50% reduction was from standing cows off in the critical late summer-autumn months when nitrogen can accumulate in the soil if plants aren't growing fast enough to use it (e.g. under dry/drought conditions), and winter months when urinary N deposited onto paddocks is vulnerable to leaching.

Summarised results

Table 2: Results of five lactations from 2011/12 to 2015/16.

Farmlet	Control	Future
MS produced (kg/cow/yr)	372	440
MS produced (kg/ha/yr)	1201	1151
Days in milk	244	263
Pasture growth (t DM/ha/yr)	17.0	15.5
Pasture eaten (t DM/ha/yr)	14.2	13.0
Pasture utilisation (%)	86	84
N fertiliser on pasture (kg N.ha.yr)[1]	135	60

Silage purchased (t DM/ha/yr)	1.2	0.8
Conserved feed fed (t DM/ha)	0.7	0.7
Grain fed (t DM/ha/yr)	0	0.6
Average cow live-weight (Dec)	482	482
Comparative stocking rate (kg Lwt/t DM)	89	79
Estimated OP ($/ha/yr)[2]	4310	4083
N leached (Kg N/ha)	60	34

[1] Average N for current farmlet for 5 years. Average N for future farmlet for first 3 years, in year 4 and 85 & 91 kg N/ha applied;

[2] Based on a milk price of $7.40/kg MS using DairyNZ developed calculator.

How were these results achieved?

Efficient use of Fertiliser

The Future farmlet aimed to improve the efficiency of N fertiliser use by only applying it to match early season feed demand and improve grass growth to extend lactation later in the season.

Apply 25 kg/N/ha early season and 25 kg/N/ha late season (March), 75 kg/ha less N fertiliser was applied on the Future farmlet than on the Control farmlet.

Use of a stand-off pad

Lactating cows were stood off paddock for 8 hours per day in March and April and dry cows for 16 hours per day in May and June. Cows were stood off on a wood chip uncovered loafing pad with drainage/seepage captured in the effluent storage system.

There were gains from protecting pastures and also from evenly spreading effluent N back onto paddocks when it could be captured by actively growing pasture.

Maintaining per hectare production

The Future farmlet produced ~70 kg MS/cow/yr more than the Control herd. To achieve this the farmlet increased intake per cow by an estimated 0.7 t DM feed/yr.

- Cows culled and dried off later
- Used high genetic merit cows which provided efficiency gains
- Used a high standard of pasture management (weekly farm walks, SPR, 1500- 1600 kg DM/ha) as a lower stocking rate can result in higher grazing residuals, impacting on pasture quality
- Accurately identified and harvested surplus grass into good quality silage
- Focused on appropriate drying off decisions including body condition score targets and APC at calving.