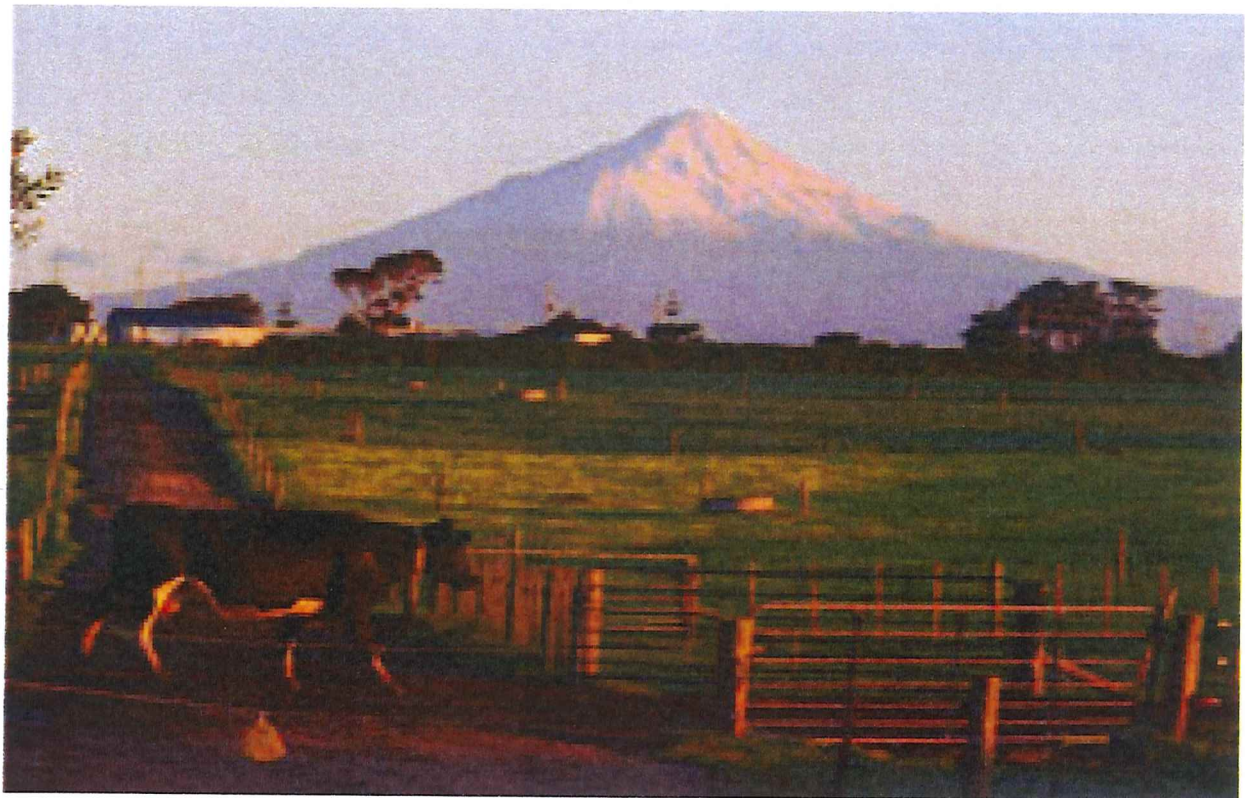


Dairy Trust Taranaki

Step Change Trial Open Day

Wednesday May 26th



DTT Gibson Farm 67 Whareroa Road

SN 40374

0800 4 DairyNZ (0800 4 324 7969)
www.dairynz.co.nz

DairyNZ 

Agenda

- 10.30 Introduction and H&S**
- 10.45 Welcome from the Trust**
- 11.00 What is Step Change**
- 11.10 Trial Design and results**
- 11.30 Farm Walk**
- 12.30 Partner farms**
- 12.50 What does the future look like?**
- 1.00 Lunch**

Lunch Proudly sponsored by


ravensdown

Step change program

Reduce footprint & keep profit?

Zero carbon bill

Methane reduced by 10% in 2030 & 24 – 47% by 2050

- 3-year Farmlet study at DTT Gibson
- 2 farmlets
 - Current = 3.1 cows/ha, 190 kg N/ha, up to 700 kg DM/cow imported feed
 - Future = 2.5 cows/ha, 75 kg N/ha, up to 300 kg DM/cow imported feed

Results year 1 2020.2021 season

	Current	Future
Cows/ha	3.1	2.5
Kg N/ha	166	75
Pasture grown (t DM/ha)	16.8	15.4
Imported feed (t DM/ha)	0.7	0.01
Total feed offered (t DM/ha)	17.5	15.41
Estimated feed eaten (t DM/ha)	15.8	12.9
% Utilised	90	84

Milksolids production

	Current	Future
Kg MS/ha	1281	1070
Kg MS/cow	407	418
Days in milk	273	288
Kg LWT/cow (Jan)	513	517
MS as % LWT	0.80	0.81

Economics

	Current	Future	% diff (current – future)
Milk income (\$7.70/kg MS)	9864	8216	-17
Stock sales	695	579	
Total income	10558	8795	-17
Total FEW expenses	5201	4095	-21
Operating profit/ha	5357	4700	-12 (-657)
FWE/kg MS	4.06	3.84	
Op profit/ha @ \$5/kg MS	1898	1819	
Op profit/ha @ \$6/kg MS	3179	2886	
Op profit/ha @ \$7/kg MS	4460	3953	
Op profit/ha @ \$8/kg MS	5741	5020	

Milk price needed for similar operating profit/ha = \$8.30 / kg MS

GHG (t ECO₂/ha/yr) & N loss summary

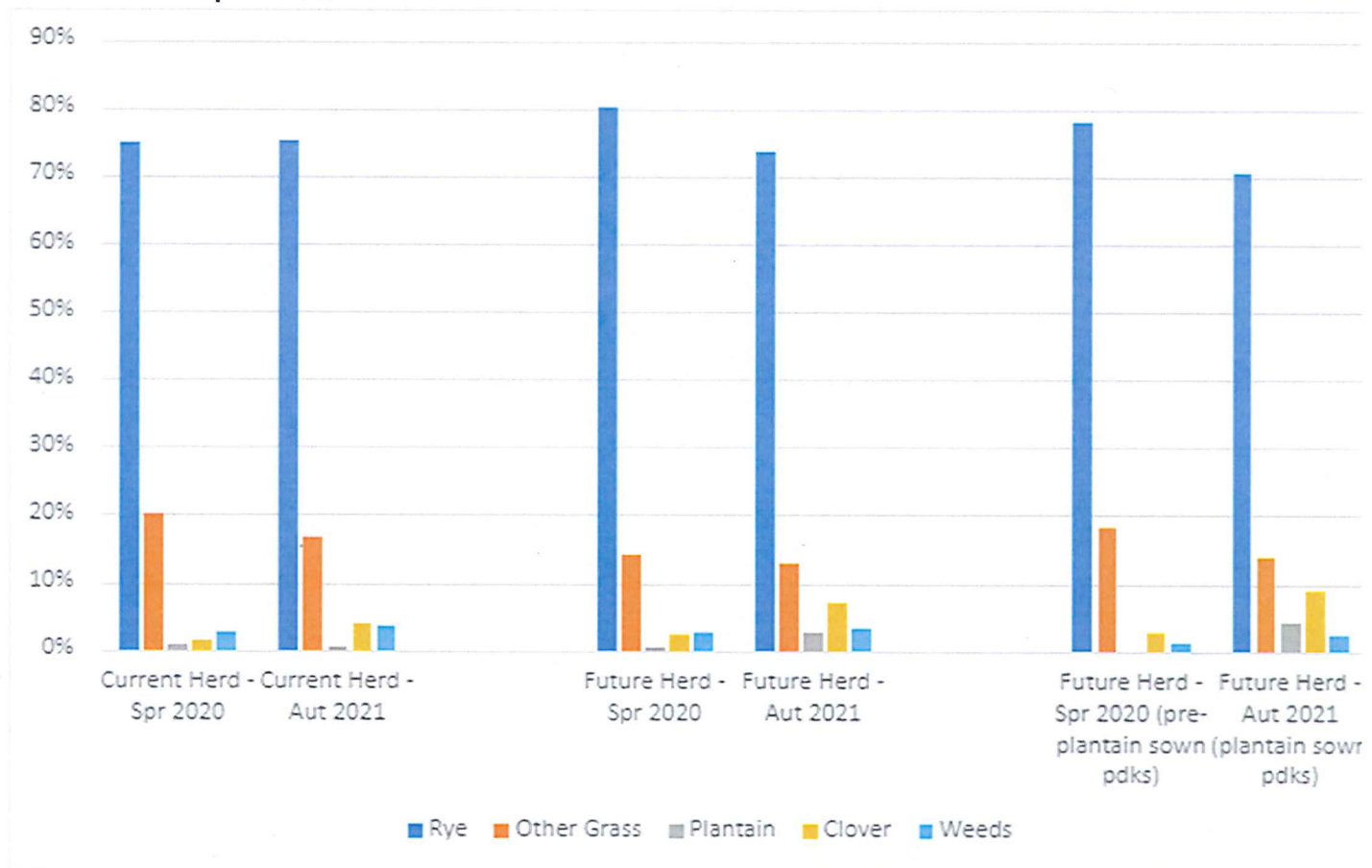
	Current	Future	% diff (current – future)
Total GHG/ha (t ECO ₂ /ha/yr)	12.5	9.9	-21
Methane (t ECO ₂ /ha/yr)	8.3	7.2	-13 (target10%)
N ₂ O (t ECO ₂ /ha/yr)	2.7	2.0	-26
CO ₂ (t ECO ₂ /ha/yr)	1.4	0.7	-50
GHG/kg MS (kg CO ₂ -eq /kg MS)	9.8	9.3	-5
N loss (kg N/ha)	45	35	-22
N Surplus (kg N/ha)	223	162	-27
NCE%	25	29	

Soil carbon & Organic matter (spring 2020)

	Current	Future	
Soil Carbon (% ww)	8.6	8.7	Medium level
Organic matter (% ww)	14.8	15.1	Medium level

Typical concentrations of carbon in NZ Allophane soils = 6-10

Botanical composition



Summary of Year 1 farmlet trial

Future farmlet effect

- N input – 91 kg N/ha
 - Pasture growth – 1.4 t DM/ha
 - Milk production – 211 kg MS/ha
 - Operating profit -14% (\$657/ha)
 - Total GHG – 21%
 - Methane – 13%
- N loss - 10 kg N/ha = 22%

Challenge will be to improve per cow production = calving 5 days earlier,
better quality pastures.

Crams modelling results.

Mitigation	Base (20/21)	1. Less cows & less imported supplements.	2. Increase SR & winter off.	3. Remove summer crop.
N loss kg/ha	70	67	72	60
Purchased N-surplus (Overseer)	115	95	120	111
Total N loss (KgN)	8,218	7,842	8,460	7,098
P loss (Pkg/ha)	1.4	1.4	1.5	1.5
Total P loss	170	167	176	173
Total feed eaten including grazing off/ha (MP)(FARMAX)	17.3	16.5	19.1	17.3
Methane kg/ha (Overseer)	7764	7576	7758	7843
NO2 kg/ha (Overseer)	2355	2282	2422	2322
CO2 kg/ha (Overseer)	2817	1688	2856	2837
Total GHG kg/ha (Overseer)	12936	11546	13036	13002
N loss % reduction	0%	-5%	3%	-14%
P loss % reductions	0%	-2%	4%	2%
Total GHG % reduction	0%	-11%	1%	1%
Operating profit	2551	2597	3112	2521
% Change operating profit relative to base	0%	2%	22%	-1%

Outcomes and Plans

The goal for the coming season is to reduce the crops by half but to keep the stock rate the same. Pasture Management become very difficult with the low numbers. The Crams will also look at managing their effluent block separately to reduce overall nitrogen use. With increased fertility and pasture management the aim is to still reduce imported feed

O'Sullivan modelling results.

Mitigation	Base (20/21)	1a. Less N same pasture eaten.	1b. Less N less pasture eaten + maize silage.	1c. Less N less pasture eaten + winter off 100 cows.	1d. Less N less pasture eaten + winter off 200 cows	2a. Winter milk no contract	2b. Winter milk with a contract
N loss kg/ha	53	39	39	37	36	44	44
Purchased N-surplus (Overseer)	206	125	133	129	116	158	158
Total N loss (KgN)	7,958	5,862	5,909	5,572	5,413	6,715	6,715
P loss (Pkg/ha)	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total P loss	124	124	122	124	123	120	120
Total feed eaten including grazing off/ha (MP)(FARMAX)	16.8	16.8	16.7	16.8	16.9	17.5	17.5
Methane kg/ha (Overseer)	7892	7895	7896	7658	7491	8082	8082
NO2 kg/ha (Overseer)	3094	2689	2597	2614	2592	2450	2450
CO2 kg/ha (Overseer)	2178	1856	2008	1918	1684	2547	2547
Total GHG kg/ha (Overseer)	13164	12440	12501	12190	11767	13079	13079
N loss % reduction	0%	-26%	-26%	-30%	-32%	-16%	-16%
P loss % reductions	0%	0%	-2%	0%	-1%	-3%	-3%
Total GHG % reduction	0%	-5%	-5%	-7%	-11%	-1%	-1%
Operating profit	3150	3344	3013	3104	3123	2913	3464
% Change operating profit relative to base	0%	6%	-4%	-1%	-1%	-8%	10%

Outcomes and Plans

Winter milking is an attractive option for this farm due to the ongoing dry summers however doing so without a Winter contract is not feasible and contract are almost impossible to obtain.

Therefore the challenge is to reduce the N use while maintaining pasture production. N application decision rules are being developed to optimize N use which should minimize pasture production loss