MASSEY UNIVERSITY

Massey Agricultural Experiment Station – Dairy 1

History:
Dairy 1 occupies land purchased from the Batchelar Estate for the establishment of Massey Agricultural College in 1926. A dairy herd was established in 1929 and is the basis of the present Dairy 1. The farm has changed over the years with the better Karapoti Brown Loam soils annexed by other organisations. Consequently, Dairy 1 now utilises the lighter river accretion soils adjacent to the Manawatu River. The farm has produced winter milk for over 40 years. In February 2004, almost 90 per cent of the farm was inundated by floodwaters leaving significant silt deposits after recession.

On 1st August 2013, Dairy 1 became a systems trial called Future Farms. The farm switched to Once-a-Day (OAD) milking, spring calving system. 240 cows are milked OAD for 300 days. Already the genetics of the herd are being accessed with help from LIC.

This Future Farm Project has emphasis on people, community, biodiversity, water & energy efficiency, low inputs, high technology, One Plan sensitive river catchment, cow longevity, reproductive efficiency, high solids milk sold, animal welfare & best practice. Massey University is working with farmers and industry to find the best solutions for competitive and responsible dairying in a sensitive New Zealand River catchment. We have research programmes underway particularly to benchmark the initial phase of this project. Several more programmes of research are planned.
For this trial the 9 main points of sustainable farming are taken as being:

1. To have a profitable farm business;
2. To manage soils for the future with less dependence on fertilizers, and to build soil organic matter in order to increase soil carbon levels;
3. To reduce energy consumption by reducing demand and generating on-farm energy supply;
4. To better manage water (conserve and reduce use), and reduce pollutant losses.
5. To have sustainable people management practices;
6. To increase the biodiversity on the farm;
7. To develop long-term business communication strategies not only with buyers, but with the professional support teams and the local community;
8. To lower the carbon footprint of milk production; and
9. To improve dairy cow welfare, fertility and animal health.

Objectives:

- To be managed as a profitable, low input, sustainable pasture-based dairy farm
- To provide a teaching resource for undergraduate and postgraduate programmes and be involved in research and extension of Once-a-Day seasonal supply low input system in a sensitive nutrient zone.
- To provide a link between the University and Agribusiness.

Location:	Dairy 1 is located adjacent to the Massey University campus, bounding the Manawatu River. 3 km from Palmerston North City.
Altitude:	35m above sea level.
Rainfall:	980mm (average annual rainfall). 1010mm rainfall for 2004/2005 season.
Temperature:	7°C July, 18.5°C (monthly 10cm soil temp.).
Soils:	Free-draining alluvial soils. A complex association of river soils, including: Rangitikei Loamy Sand, Manawatu Fine Sandy Loam, Manawatu Sand Loam/Gravelly phase, Manawatu Mottled Silt Loam, Karapoti Brown Sandy Loam. These soil types are well to excessively-well drained, prone to summer drought. High in natural fertility. Overlaying gravels are present, in some cases within 10cm of surface.
Area:	142.7 hectares.
Effective Area:	119.7 hectares.
Irrigation:	32 hectares of the farm is able to be irrigated.

Subdivision: The farm is subdivided into approximately 65 x 1.9 hectare paddocks, all with race access.

Drainage: Free draining.

Water Supply: Massey University water supply, reticulated to all paddocks.

Staff: One permanent staff and casual staff as required.

Genetics and breeding:
The long term plan for breed composition at Dairy 1 is to have a herd of 240 cows composed of 80 Jerseys, 80 Friesians, 80 Crossbreds. The Jerseys are mated to Jersey sires, Friesians to Friesian sire and the crossbred animals are mated to crossbred sires as of the 2013/2014 dairy season. Bulls are selected on the Once-a-Day selection index developed by LIC. A new culling decision index is now being developed for OAD milking using the data obtained from the cows at Dairy 1. Production (milkfat, protein and lactose yields per cow), productivity (milksolids/hectare) and efficiency (milksolids/kilogram of liveweight, milksolids/tonne of dry matter) are all being evaluated for the breeds.

Farm Dairy:
Milking Facility: 24 aside herringbone shed equipped with Westfalia metatron.
Feed Pad: Concrete feeding pad (200 cow capacity).

Pasture:
Pastures are predominantly perennial ryegrass / white clover species. Pastures are renewed on a ten-year rotation.
Historically, Dairy 1 has grown on average, 13.9t DM/ha/year.

Grazing Policies:
Pasture based production system aiming to achieve high levels of feed conversion efficiency through excellent grazing management.

The following stock are typically grazed off the farm:
Heifer Calves
Yearling Heifers
Cows grazed off (varies between 140-200 spring cows for 6 weeks in June/July)

Supplements are used to extend lactation and buffer the effects of seasonal pasture growth.

Crops and Supplements:
Ten hectares of Lucerne and ten hectares of chicory, plantain red and white clover mix have been planted.
Maize silage, grass silage and baleage are purchased according to seasonal requirements. Hay is fed to dry stock when needed. Other mineral supplementation bought in as required.

The intention is to grow all supplement on farm.

Stocking Rate & Production:

*information is from farm factsheet, includes any dumped milk due to research. For more up to date information please go to agstation.massey.ac.nz

Genetics and breeding:
The long term plan for breed composition at Dairy 1 is to have a herd of 260 cows composed of 80 Jerseys, 80 Friesians, 80 Crossbreds. The Jerseys are mated to Jersey sires, Friesians to Friesian sire and the crossbred animals are mated to crossbred sires as of the 2013/2014 dairy season. Bulls are selected on the Once-a-Day selection index developed by LIC. A new culling decision index is now being developed for OAD milking using the data obtained from the cows at Dairy 1. Production (milkfat, protein and lactose yields per cow), productivity (milksolids/hectare) and efficiency (milksolids/kilogram of liveweight, milksolids/tonne of dry matter) are all being evaluated for the breeds.

Stocking Rate & Production:

	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Total Milksolids Supplied (kg)	90,842	92,783	92,299	87,335	77,496	91,004	99,334
Cows Milked (Peak)	256	264	258	251	242	261	262
Stocking Rate (cows/ha)	2.2	2.3	2.2	2.1	2.0	2.2	2.2
Milk Production (kg MS/cow)	355	351	358	348	320	349	379
Milk Production (kg MS/ha)	392	400	398	376	346	412	449

Mating:
Planned start of mating is 18th October for 9 weeks. Artificial breeding only.

	2014/2015	2015/2016	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Repro 6 Week	85%	76%	74%	83%	79%	77%	74%
Repro Empty	8%	9%	12%	9%	9.0%	9%	13%
Mating AB (Weeks)	10	10	10	10	10	10	10
Mating Natural (weeks)	6	5	0	0	0	0	0
Total Weeks Mating	10	10	10	10	10	10	10

Farm Dairy:
Milking Facility: 24 aside herringbone shed equipped with Westfalia metatron.
Other Facilities: 5- bay calf shed Office, storage room, teaching room
Feed Pad: Concrete feeding pad (280 cow capacity).

Pasture:
Pastures are predominantly perennial ryegrass / white clover species. Pastures are renewed on a ten-year rotation.
Historically, Dairy 1 has grown on average, 13.9t DM/ha/year.

Grazing Policies:
Pasture based production system aiming to achieve high levels of feed conversion efficiency through excellent grazing management.

The following stock are typically grazed off the farm:

Heifer Calves
Yearling Heifers
Cows grazed off (numbers variable but <200 spring cows for 6 weeks in June/July)

Supplements are used to extend lactation and buffer the effects of seasonal pasture growth.

Crops and Supplements:
Ten hectares of Lucerne and ten hectares of chicory, plantain red and white clover mix have been planted.
Maize silage, grass silage and baleage are purchased according to seasonal requirements. Hay is fed to dry stock when needed. Other mineral supplementation bought in as required.

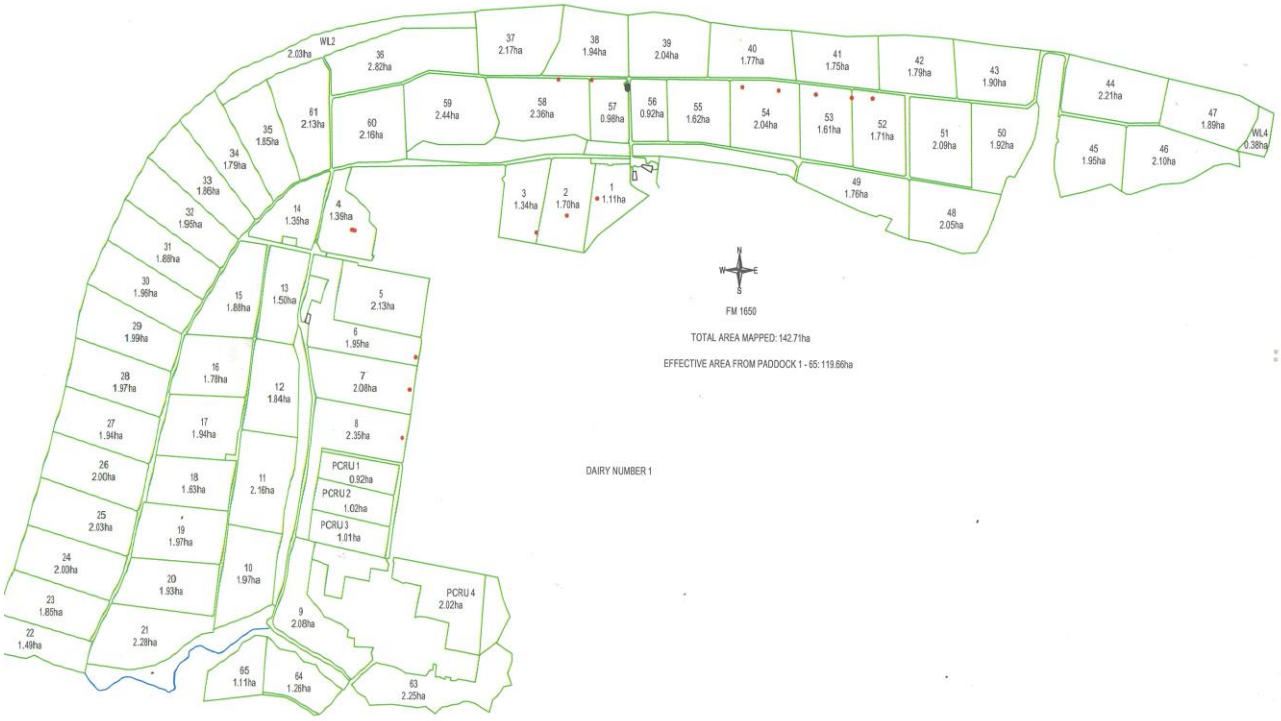
The intention for the new system is to grow all supplement on farm.

Regrassing Policy:
Currently, 12-15 ha are re-grassed annually into perennial ryegrass/clover (ie. grass-to-grass).

Fertiliser:
Fertiliser programmes generally are different every year. In the past they have put on several strategic applications of nitrogen throughout the year (at application rates of 30-40 kg N / ha). The intention for the new system is for fertiliser to be looked into in more detail due to the farm location and change to farm system. Fertiliser is currently selected based on soil tests, plant demand and climate data. Soil tests are done biannually; please see soil test results below.

Year	pH	Olsen P	SO_4	K	Mg
2012	6.0	39	6	8	32
2010	5.7	38.7	9.7	5	27
2004	6.0	27.3	17.7	5	28
2002	5.8	44.1	5.6	5	27
2016	5.7	30	12	11	35
2018	6.0	33	11	10	30
2020	5.9	26	16.8	7	31

Dairy 1 Farm Map


WL2
2.03ha
36
2.82ha
37
2.17ha
38
1.94ha
39
2.04ha
40
1.77ha
41
1.75ha
42
1.79ha
43
1.90ha
44
2.21ha
47
1.89ha
WL4
0.38ha
46
2.10ha
45
1.95ha
61
2.13ha
60
2.16ha
59
2.44ha
58
2.36ha
57
0.98ha
56
0.92ha
55
1.62ha
54
2.04ha
53
1.61ha
52
1.71ha
51
2.09ha
50
1.92ha
49
1.76ha
48
2.05ha
35
1.85ha
34
1.79ha
33
1.86ha
32
1.96ha
31
1.88ha
30
1.96ha
29
1.99ha
28
1.97ha
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26
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25
2.03ha
24
2.00ha
23
1.86ha
22
1.49ha
14
1.39ha
4
1.39ha
3
1.34ha
2
1.70ha
1
1.11ha
15
1.88ha
13
1.50ha
5
2.13ha
6
1.95ha
16
1.78ha
12
1.84ha
7
2.08ha
17
1.94ha
8
2.35ha
18
1.63ha
11
2.16ha
PCRU 1
0.92ha
PCRU 2
1.02ha
PCRU 3
1.01ha
19
1.97ha
10
1.97ha
20
1.93ha
PCRU 4
2.02ha
9
2.08ha
21
2.28ha
65
1.11ha
64
1.26ha
63
2.25ha
N
W
E
S
FM 1650
TOTAL AREA MAPPED: 142.71ha
EFFECTIVE AREA FROM PADDOCK 1 - 65: 119.66ha
DAIRY NUMBER 1

Dairy 1

MASSEY - NO 1 DAIRY FARM - UNIT 2931 - 7097941
Date printed: 16/01/2020
0800 73 73 73
www.hawkeye.farm

0 75 150 300 450 600
Metres

HawkEye