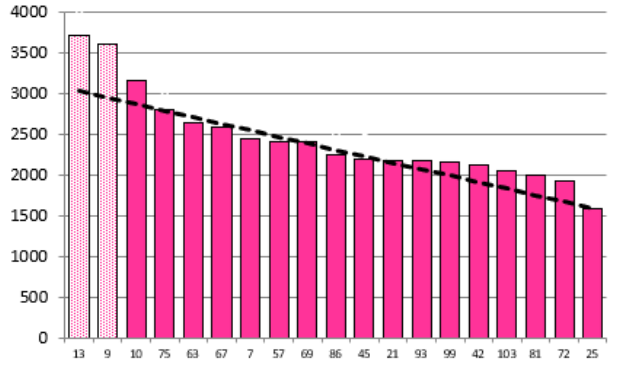
2021/22 Season
Hub Weekly Farm Update
Date: 16/12/2021

Date 15-12-21

Herd size (cows)	194	Average Cover	2452
Target residual (kg DM/ha)	1600	Average Growth	43
Target pasture intake (kg DM/cow	17	Farmlet area	55.1
Target Area offered (ha/day)	2.30	Target rotation length	24
Last week actual rotation (d)	27	Target demand	60
Last week supp (kg DM/cow)	1.0	YTD supp (kg DM/cow)	310
Last week N (kg N/ha)	4	Fert N YTD	97
Milk yield (L/cow)	19.7	Effluent N YTD	3
Fat%	5.0	Last wk MS	1.9
Prot%	4.1	YTD MS/cow	240
SCC	94	YTD MS/ha	740
Average BCS	4.5	% less than BCS 4	7%

Standard Kale

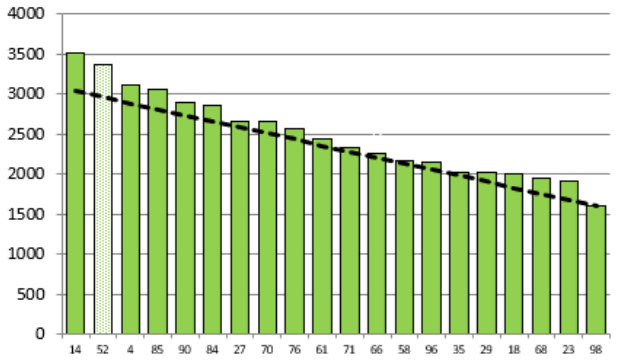


	13	9	10	75	63	67	7	57	69	86	45	21	93	99	42	103	81	72	25
DaysGrazed3	27	28	18	14	11	16	13	8	10	6	7	21	3	8	16	9	1	4	0
N_3	111	91	110	111	111	111	111	91	86	111	111	111	111	111	111	111	111	110	121
Growth3	58	92	88	58	34	26	36	58	10	0	0	24	0	42	2	32	0	0	0

Farmlet notes: Visual APC 2377, GR 63; we missed the weather window to cut baleage this week & weather unsettled for the next 10 days; pdks 13 & 9 will be pre-graze mown & grazed; no inshed feeding for next week except low BCS cows on OAD milking; bulls with the herds and being rotated twice per week; 10 cows mated by the bulls this week

Herd size (cows)	194	Average Cover	2476
Target residual (kg DM/ha)	1600	Average Growth	40
Target pasture intake (kg DM/cow	17	Farmlet area	57.7
Target Area offered (ha/day)	2.3	Target rotation length	25
Last week actual rotation (d)	28	Target demand	57
Last week supp (kg DM/cow)	0.7	YTD supp (kg DM/cow)	254
Last week N (kg N/ha)	6	Fert N YTD	92
Milk yield (L/cow)	18.7	Effluent N YTD	5
Fat%	4.8	Last wk MS	1.8
Prot%	4.0	YTD MS/cow	236
SCC	130	YTD MS/ha	706
Average BCS	4.5	% less than BCS 4	9%

Standard Fodder Beet



	14	52	4	85	90	84	27	70	76	61	71	66	58	96	35	29	18	68	23	98
DaysGrazed2	18	23	16	17	15	13	19	11	12	9	8	8	4	5	1	8	7	17	2	0
N_2	111	110	111	121	91	82	111	110	86	81	81	86	111	111	111	111	111	72	111	111
Growth2	98	88	50	32	69	20	10	22	40	56	42	16	0	0	0	16	0	2	0	0

Farmlet notes: Visual APC 2445, GR 60; we missed the weather window to cut baleage this week & weather unsettled for the next 10 days; pdk 52 will be pre-graze mown & grazed; Pdks 27 & 76 ID for baleage; all lifted beet has been fed; PKE to cows less than BCS 4; bulls with the herds and being rotated twice per week; 9 cows mated by the bulls this week

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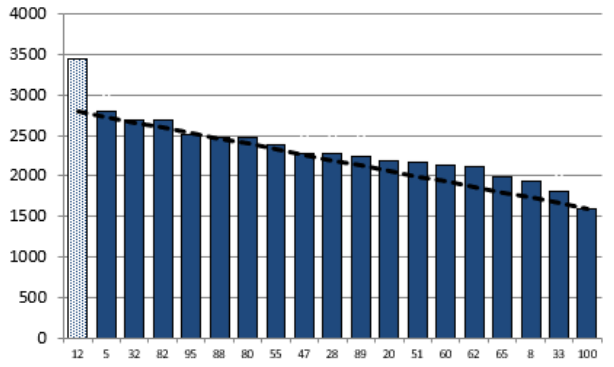
Herd size (cows)	161	Average Cover	2325
Target residual (kg DM/ha)	1600	Average Growth	30
Target pasture intake (kg DM/cow)	17	Farmlet area	55.2
Target Area offered (ha/day)	2.3	Target rotation length	24
Last week rotation avg	24	Target demand	50
Last week supp (kg DM/cow)	1.3	YTD supp (kg DM/cow)	229
Last week N (kg N/ha)	4	Fert N YTD	31
Milk yield	19.3	Effluent N YTD	5
Fat%	4.8	Last wk MS	1.9
Prot%	4.0	YTD MS/cow	252
SCC	94	YTD MS/ha	686
Average BCS	4.5	% less than BCS 4	8%

Herd size (cows)	162	Average Cover	2283
Target residual (kg DM/ha)	1600	Average Growth	43
Target pasture intake (kg DM/cow)	17	Farmlet area	55.1
Target Area offered (ha/day)	2.3	Target rotation length	24
Last week rotation avg	24	Target demand	50
Last week supp (kg DM/cow)	1.2	YTD supp (kg DM/cow)	227
Last week N (kg N/ha)	2	Fert N YTD	31
Milk yield	17.3	Effluent N YTD	7
Fat%	5.0	Last wk MS	1.6
Prot%	4.0	YTD MS/cow	231
SCC	119	YTD MS/ha	585
Average BCS	4.5	% less than BCS 4	2%

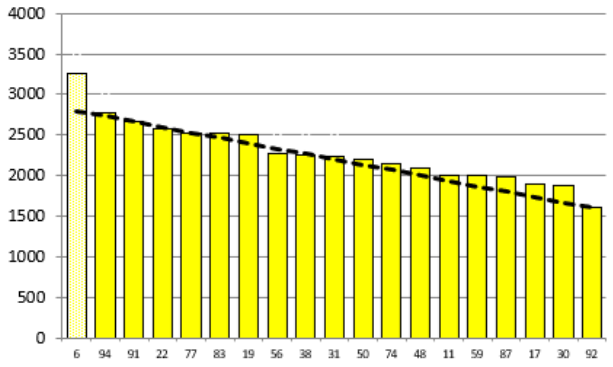
Low Impact Kale



	12	5	32	82	95	88	80	55	47	28	89	20	51	60	62	65	8	33	100
DaysGrazed1	33	15	18	14	21	12	17	10	9	13	1	6	5	17	7	4	8	3	0
N_1	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
Growth1	28	62	36	26	76	26	22	8	18	12	0	0	0	16	0	0	35	0	0

Farmlet notes: Visual APC 2233, GR 44; we missed the weather window to cut baleage this week & weather unsettled for the next 10 days; pdk 12 will be pre-graze mown & grazed; no inshed feeding for next week except low BCS cows on OAD milking; bulls with the herds being rotated twice per week; 8 cows mated by the bulls this week; 2 pdks for 2nd round N

Low Impact Fodder Beet



	6	94	91	22	77	83	19	56	38	31	50	74	48	11	59	87	17	30	92
DaysGrazed4	22	14	15	13	17	2	18	3	10	7	8	9	11	17	1	17	4	5	0
N_4	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
Growth4	100	66	66	18	54	0	66	0	50	0	6	12	42	10	0	26	0	0	0

Farmlet notes: Visual APC 2287, GR 51; Pdks 6 will be pre-graze mown & grazed thsi week; all lifted beet has been fed; 2 bales of baleage required this week; PKE being offered to cows below BCS 4.0; bulls with the herds and being rotated twice per week; 6 cows mated by the bulls this week; x1 pdk topped this week; 2 pdks left for 2nd round N application

NB: shaded paddocks are earmarked for pre-graze mowing

Table 1: Key Herd Numbers 16/12/2021 – number of cows in each mob

DATE: 16th Dec 2021	Std Kale	LI Kale	Std FB	LI FB	Total
Cows on Farm	193	160	194	161	708
Milkers TAD	170	140	165	152	627
Milkers OAD	23	20	29	9	81
Sick OAD	4	2	4	1	11
Slips/empty/deaths	8	6	15	5	34

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General Farm Information

Table 2: Key Weather and Feeding Numbers 16th December 2021

Soil Temp (°C) (weekly average)	18.3°C			
Rainfall (mm)	0.2mm			
Allocation Target kg DM/cow/day	**Std. Kale**	**LI Kale**	**Std FB**	**LI FB**
Milkers	18 kg DM 18 kg pasture	18 kg DM 18 kg pasture	18 kg DM 18 kg pasture	18kg DM 18 kg pasture

Key Decisions and Why?

- The feed situation is dynamic this week on farm, with the farm on a whole being in a period of surplus but the weather not looking settled enough to get baleage off.
- Growth rates are down across the district however with the rain in the forecast over the next 5-10 days, we don't expect that they will stay low, especially considering that all farmlets including the LI farmlets have received N this round.
    - There are now only 4 paddocks in the LI systems left to receive their second application of N for the season.
- Overall, feed quality across the board has improved, with the amount of seedhead around reducing and leaf increasing as we have moved past the peak heading date. 58% of the farm has now been topped or mowed for baleage so we are seeing these paddocks holding their quality in this round.
- Pre-mowing will be done in front of the cows in several paddocks for all the herds over the next couple of days

Figure 1: Std Kale herd eating in a pre-mown paddock

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- Why: Due to the unsettled weather forecast with rain predicted most days for the next week, it was decided that the likelihood of making good quality baleage from the paddocks already above pre-graze target was low and if left for another 7-10 days before mowing the regrowth will be very slow.
- Due to the length that the paddocks were, the cows would have struggled to easily harvest the pasture. By pre mowing it ensures that the cows aren't having to work as had to consume the pasture but it does mean there is less opportunity for them to select the better quality pasture from the sward.
- Pre-graze mowing and feeding will also get them back into the round quicker as we won't be waiting on contractors and weather

Figure 2: Cows eating pre mown pasture

- With bringing the baleage paddocks back into the rotation several paddocks further down the wedge will be earmarked for baleage when the weather settles. This will ensure the baleage should be of higher quality than that which would have been made from the paddocks stepped over last week.
- All supplementary feed has now been removed from the diet apart from low BCS cows that are on OAD milking. For kale herds this is a barley/PKE blend and for fodder beet herds is straight fodder beet.
- We will continue topping behind cows as required but hope that the need for this will decrease as we move into paddocks with less seedhead. There have been a couple of paddocks this week where we have topped too much green leaf to waste so we will be reassessing our pre-graze mass targets making the necessary adjustments

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Figure 3: Topped (left) and un-topped (right) areas from this week

Figure 4: Topped (right) and un-topped (left) paddock from this week

General Notes:

- This week the bulls have been out with the cows and according to the collar data, 33 cows have been mated by the bul over this period. This aligns with tail paint data this

morning with x10 Std Kale, x9 LI Kale, x9 Std FB and x6 LI FB cows having their tail paint removed.

- We now only have 3 cows that have not cycled during the mating period. These will be assessed by the vet and treated as necessary
- Based on the collar data, the 3-week incalf rate is sitting at 62% for the whole herd with the range in the different farmlets being between 60-66%.
- Looking at the data from the previous 3 seasons, there has been in a significant improvement in 3 week submission rate across the farmlets. Interesting to note that the Std FB herd has had consistently had the lowest submission rates in 1st, 2nd and 3rd weeks across the last 3 seasons.

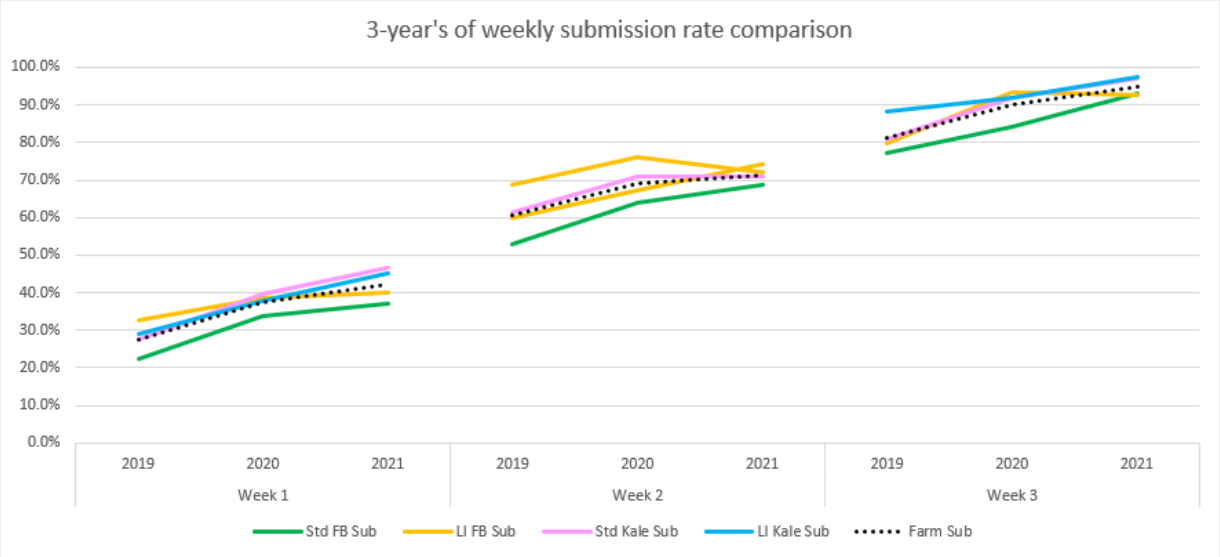


Figure 5: 3-years of weekly submission rate comparisons

- Body condition scoring was completed this week and the whole herd has lifted in condition to a herd average of 4.5, with 19 cows being returned to TAD milking as a result of being at or above BCS 4 for 2 consecutive measurements.
    - All the tech's at SDH are certified through the DairyNZ BCS accreditation programme and have recently undergone a recallibration session. This may

have contributed to the recent lift in BCS as it was identified that they were being a bit hard on the lower BCS cows.

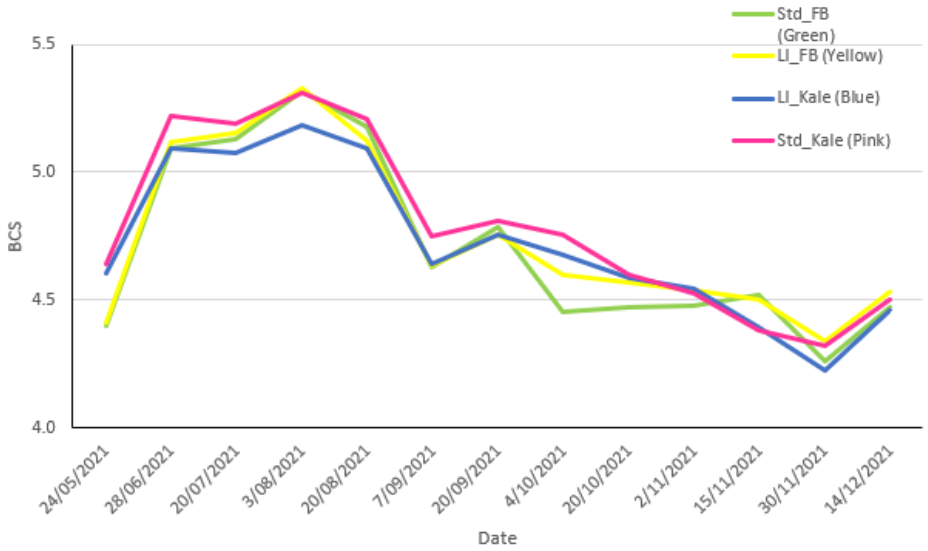
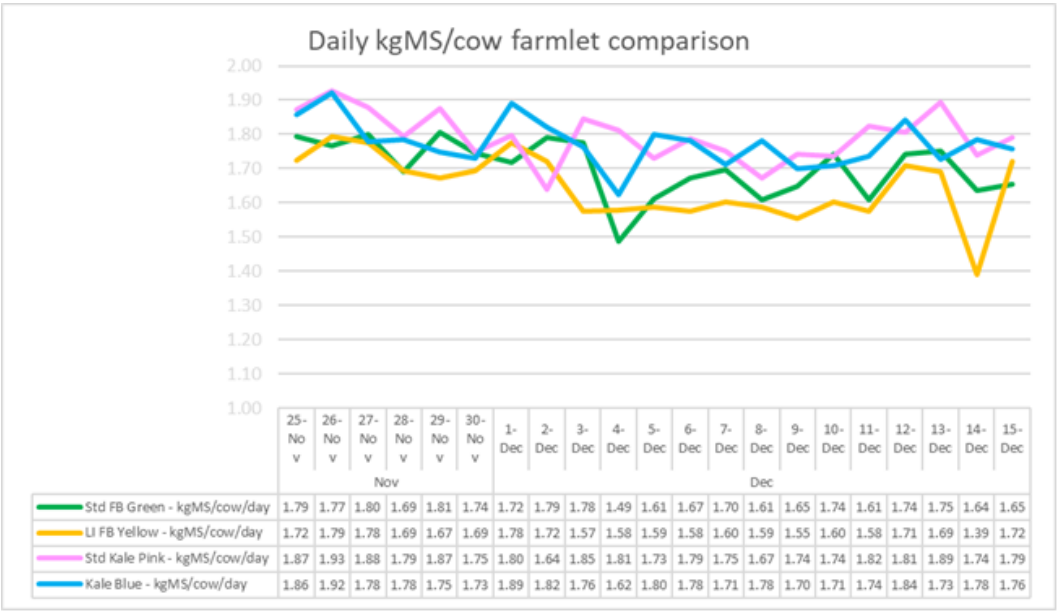


Figure 6: Body condition score data season to date

- On the whole, the farms milk production curve has flattened and with the pasture quality now improving, we expect that it will stay this way over the coming weeks.
- There was a significant unexplained reduction in the LI FB herd milk production this week from 1.7kgMS on Monday to 1.4kgMS/cow on Tuesday, however they have bounced back from this now. The FB was removed from their diet around the same time, however the Std FB herd also finished their beet at the same time and we didn't see an impact on their production.



	25-Nov	26-Nov	27-Nov	28-Nov	29-Nov	30-Nov	1-Dec	2-Dec	3-Dec	4-Dec	5-Dec	6-Dec	7-Dec	8-Dec	9-Dec	10-Dec	11-Dec	12-Dec	13-Dec	14-Dec	15-Dec
	Nov						Dec														
Std FB Green - kgMS/cow/day	1.79	1.77	1.80	1.69	1.81	1.74	1.72	1.79	1.78	1.49	1.61	1.67	1.70	1.61	1.65	1.74	1.61	1.74	1.75	1.64	1.65
LI FB Yellow - kgMS/cow/day	1.72	1.79	1.78	1.69	1.67	1.69	1.78	1.72	1.57	1.58	1.59	1.58	1.60	1.59	1.55	1.60	1.58	1.71	1.69	1.39	1.72
Std Kale Pink - kgMS/cow/day	1.87	1.93	1.88	1.79	1.87	1.75	1.80	1.64	1.85	1.81	1.73	1.79	1.75	1.67	1.74	1.74	1.82	1.81	1.89	1.74	1.79
Kale Blue - kgMS/cow/day	1.86	1.92	1.78	1.78	1.75	1.73	1.89	1.82	1.76	1.62	1.80	1.78	1.71	1.78	1.70	1.71	1.74	1.84	1.73	1.78	1.76

Figure 7: Daily kgMS/cow comparison between farmlets

- The additional selenium has been removed from the dosatron after consultation with the vets, however the additional iodine will remain in the mix until the end of January.
- Calves:
    - There are 12 calves still on milk and these will weaned next week and go onto meal.
    - Due to a slight pasture deficit at the support block following the last round of baleage the calves that are no longer on milk are recieiving PKE and baleage. Currently they are eating 3kg/calf/day of PKE.
    - 72 calves that were in the lighter weight range 3 weeks ago will be weighed and drenched with Turbo next week and will join the remaining 120 calves that are already over 120kgs.
- Heifers:
    - The bulls are being taken out of the heifers on the 21st of December.
    - Selenium and Copper bolus's will be given the same day as the farm team will be on the property drafting out the bulls.
- Both effluent irrigators are now back running at full capacity. The pond level had increased over the last few weeks when the irrigators were out of action however with 2 running now it wont take long to get on top of it again.

SDH Research & Demonstration

Greenhouse gas emissions

As part of the SDH Participatory research project, the greenhouse gas (GHG) footprint for the four SDH farmlets was calculated (Table 2) by the team at AgResearch. On-farm emission sources included rumen-derived enteric methane (CH_4) from livestock, nitrous oxide (N_2O) and CH_4 emissions from animal excreta, and N_2O and carbon dioxide (CO_2) emissions from N fertiliser applied to soil. These sources align with those included in the current He Waka Eke Noa requirements for reporting on-farm GHG emissions. For each farmlet, emissions were split into short-lived and long-lived GHGs:

- Short-lived: CH_4. Units = kg CH_4
- Long-lived: N_2O and CO_2. Units = kg CO_2 equivalents (CO_2e), based on Global Warming Potential over a 100 year time horizon (GWP_{100}).

The effect of a Lower Input system (reduced N fertiliser and supplement use and thus lower stocking rate) had a much larger effect on GHG footprints than the choice of crop type:

- The LI systems had 20% lower methane footprint and 36% lower long-lived gas footprint than the Standard farmlet systems.
- The Fodder beet systems had a 2% lower methane footprint and 7% lower long-lived gas footprint than the Kale systems.
- The reduced N inputs in the LI systems also resulted in a reduction in direct and indirect N_2O emissions from fertiliser use and from urine and dung deposition.

Enteric CH_4 from ruminants grazing pasture grown on farm was the largest methane source, representing 95% of methane footprints.

Nitrous oxide emissions from animal excreta represented 64-77% of total long-lived gas footprint, with the balance due to urea fertiliser.

Table 2: Milking platform (MP) area, milk production (kg milk solids), greenhouse gas emissions (kg of methane/ha MP and N_2O+CO_2 as kg CO_2e/ha MP) and GHG pricing for the four Southern Dairy Hub farmlets for the 2019-20 season. LI=low input; FB=Fodder beet

	Standard Kale	LI Kale	Standard FB	LI FB
armlet information				
Area of MP (ha)	62.4	63.2	63.2	65
MS production (total kg MS)	77688	65854	77104	62400
reenhouse gas emissions				
lethane (kg CH_4/ha MP)				
Enteric fermentation	400	321	392	311
Manure management	19	15	21	16
Total Methane	**419**	**336**	**412**	**326**
Nitrous oxide (kg CO_2e/ha MP)				
Urine and dung	1,967	1,521	1,839	1,357
Manure management	31	28	30	27
N fertilizer on soil	665	286	667	276
Total nitrous oxide	**2,663**	**1,834**	**2,537**	**1,660**
Carbon dioxide (kg CO_2e/ha MP)				
Total CO_2 (urea fertilizer on soil)	**384**	**165**	**385**	**159**

General Farm Systems information

The project farm systems comparison has been designed to better understand crop-based wintering in relation to consequences for environmental impact and profit

- *The four herds are split evenly on age, BW / PW, calving date and breed to ensure the herds are as even as possible.*
- *Each herd allocated a farmlet corresponding to their herd tag colour Green, Blue, Yellow and Pink.*
- *Farmlets have paddocks allocated so each herd has equal walking distance from the shed and the same proportion of each soil type and equal proportions of pastures in the FVI trial (forage value trial – refer web site section on research).*

Research Proposals

The SDH welcome research proposals for any sampling or research on the SDH, these are assessed by the Research Advisory Committee (RAC). Just send your request or ask for information via louise.cook@southerndairyhub.co.nz

For more information check out the DairyNZ link:
https://www.dairynz.co.nz/about-us/research/research-farms/southern-dairy-hub