

May 2018 Stakeholder Report

Soil Nutrient Management Project

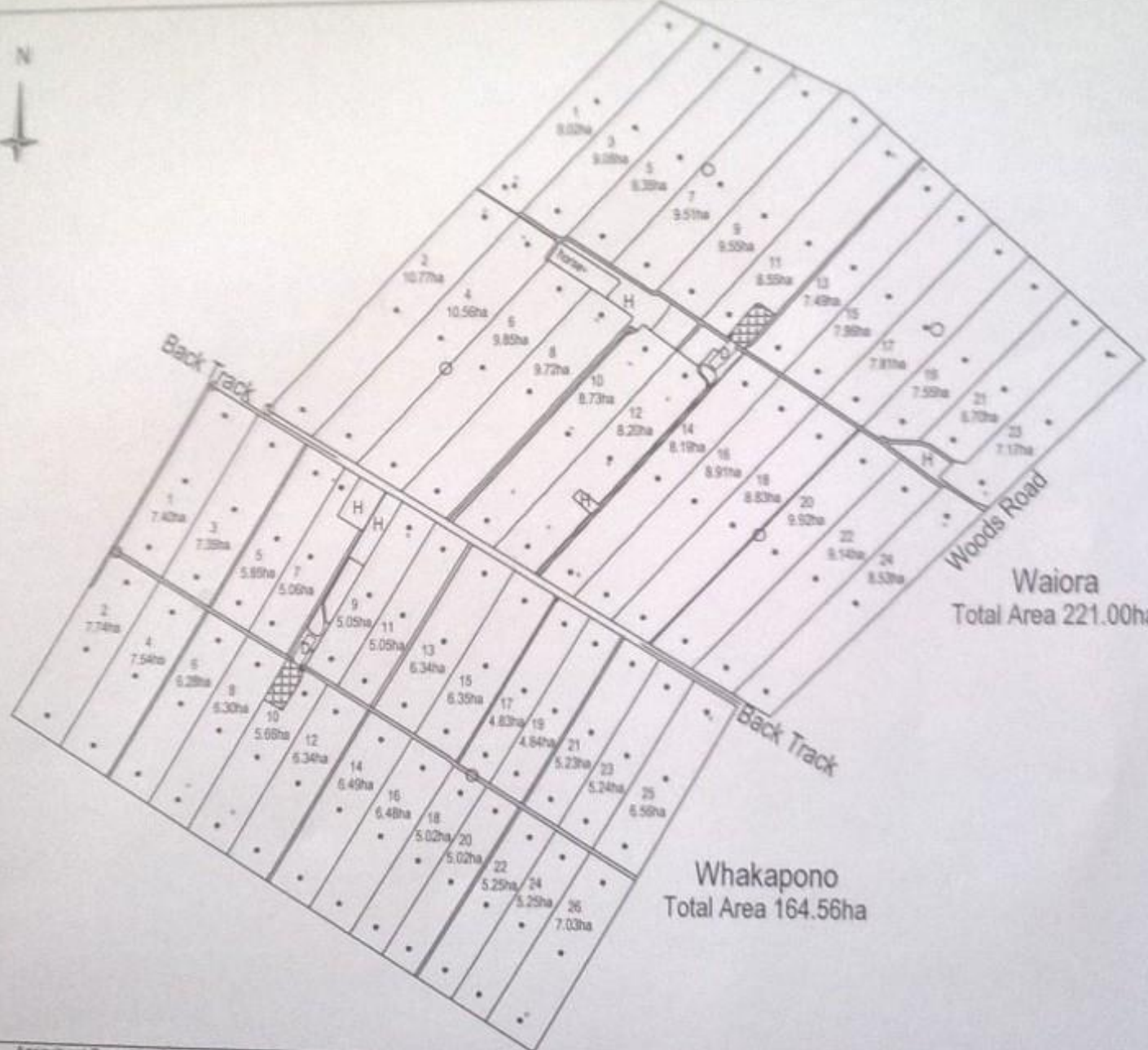


A comparison of four seasons

Thanks To

- DairyNZ
- AGMARDT
- Ballance
- Top Soils
- Hills Laboratories
- Hydrocom
- Kiwi Fertilisers
- Paddock Vets
- Perry Laboratories
- Precision Tracking
- Individual farmers and rural business professionals





Waiora
Total Area 221.00ha

Whakapono
Total Area 164.56ha



Agricultural Consulting Services
201 Smithfield Road, RD 2, Ashburton
T: 03 3088208
E: office@agconsulting.co.nz
www.agconsulting.co.nz

Legend

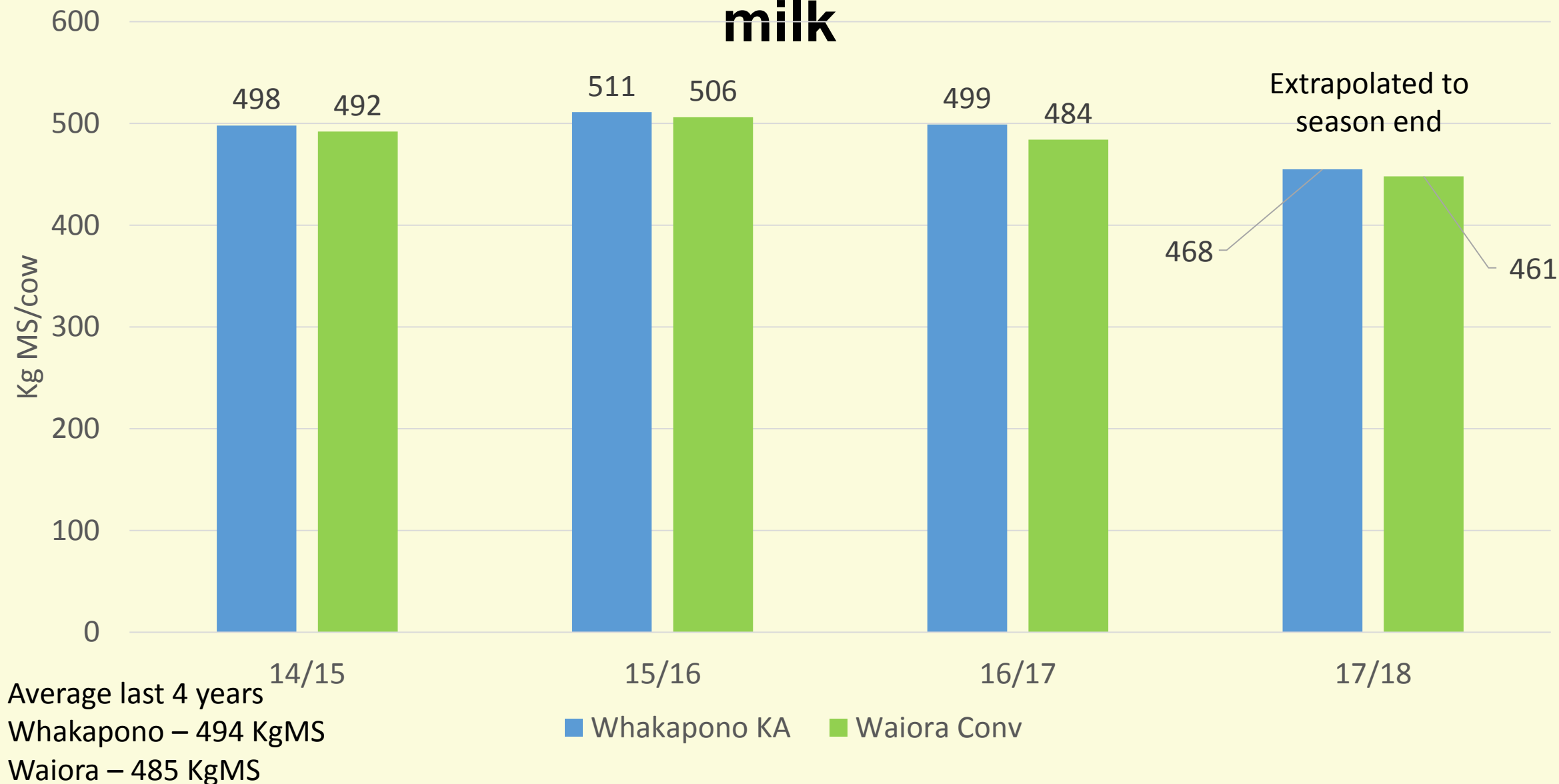
- | | | | |
|-----------|---------------|--------------|-------------|
| fences | K line | pivot point | D dairyshed |
| buildings | water troughs | BCI turnball | |
| houses | tanker track | effluent | |

Drawn By: T Kingsbury
File: ACS 279
Date: 31.10.2012

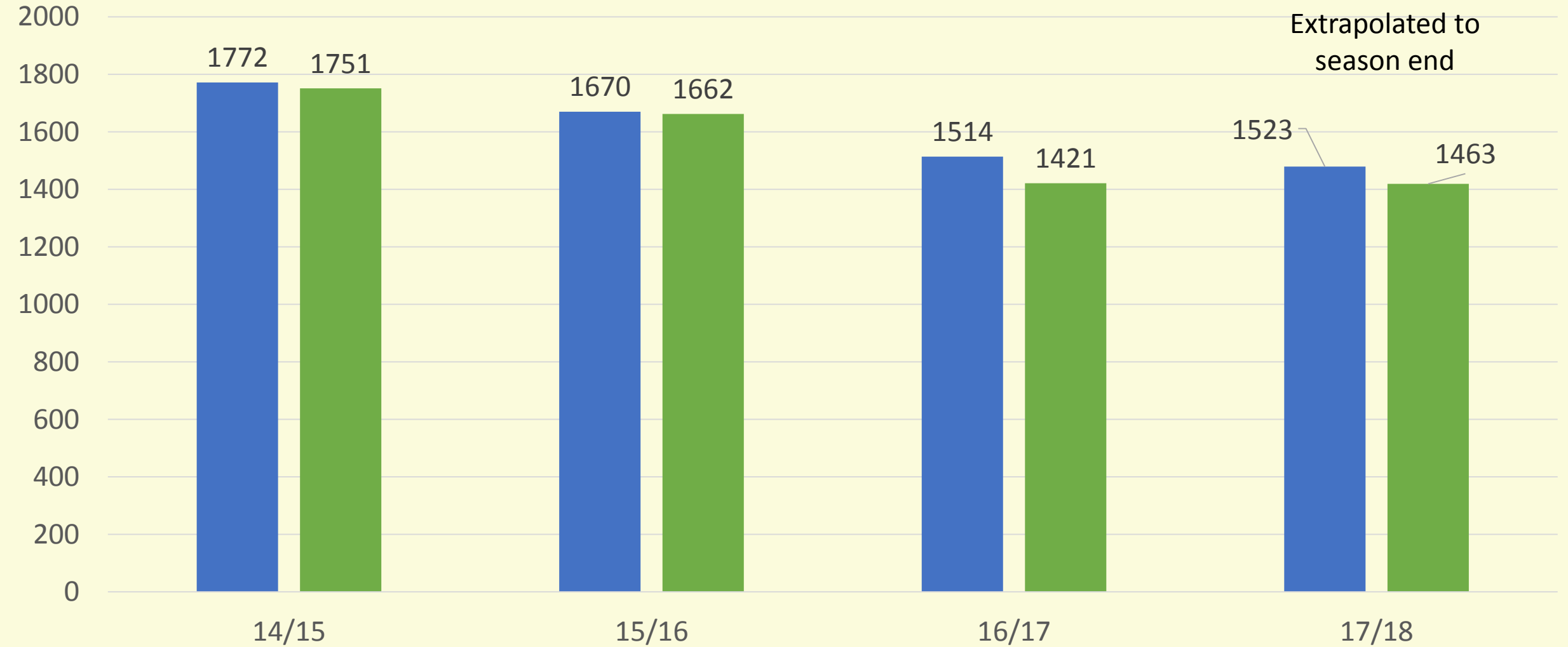
Backtrack Dairies

	Whakapono	Waiora
Effective Area	155	210
Stocking Rate	3.4	3.3
Peak Cows	523	690
Treatment	Kinsey-Albrecht (KA)	Conventional (Conv)
Total MS/ha	1523	1463
Total MS/cow* incl calf milk	468	461
Total N Applied	107	132
N Leaching estimate	37	37

Milk Production KgMS/Cow – including calf milk



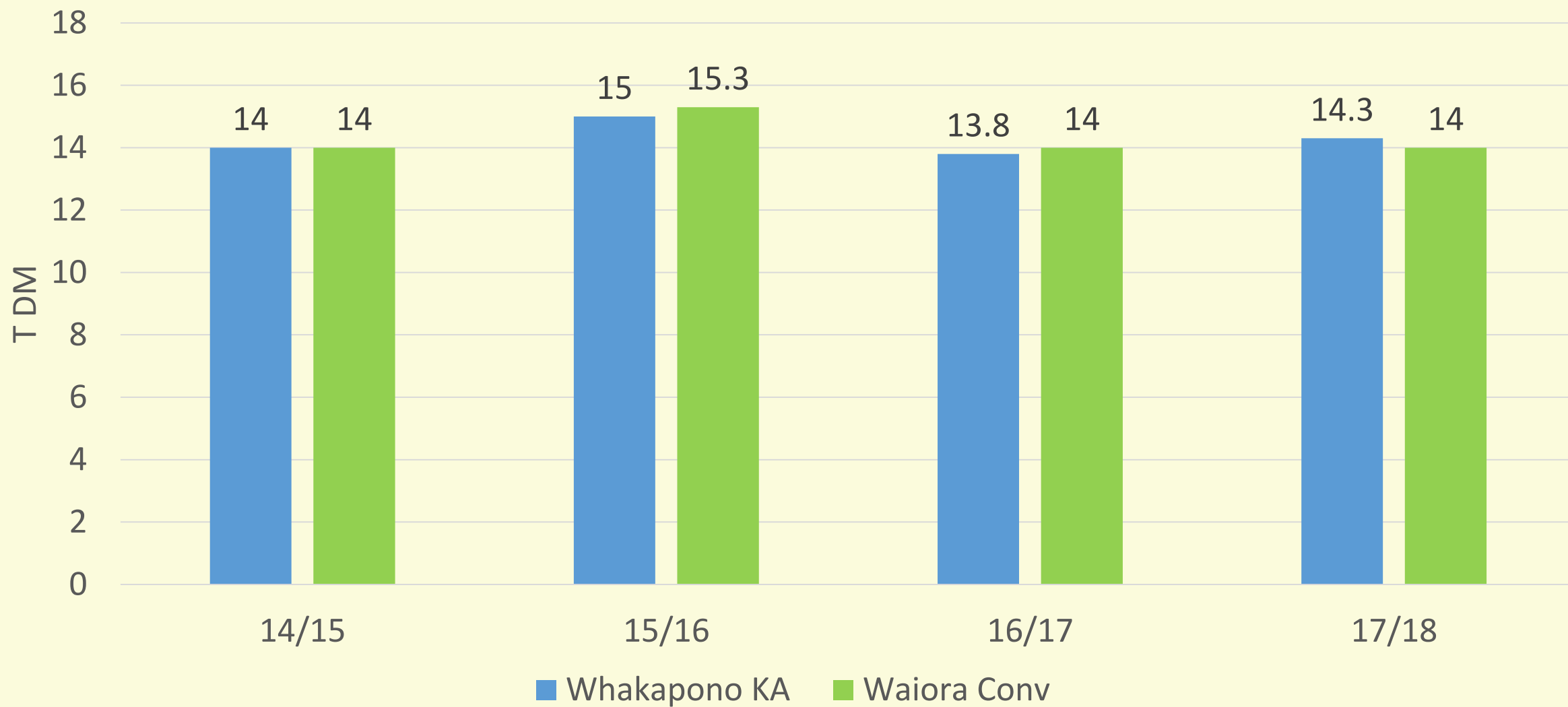
Milk Production MS/Ha



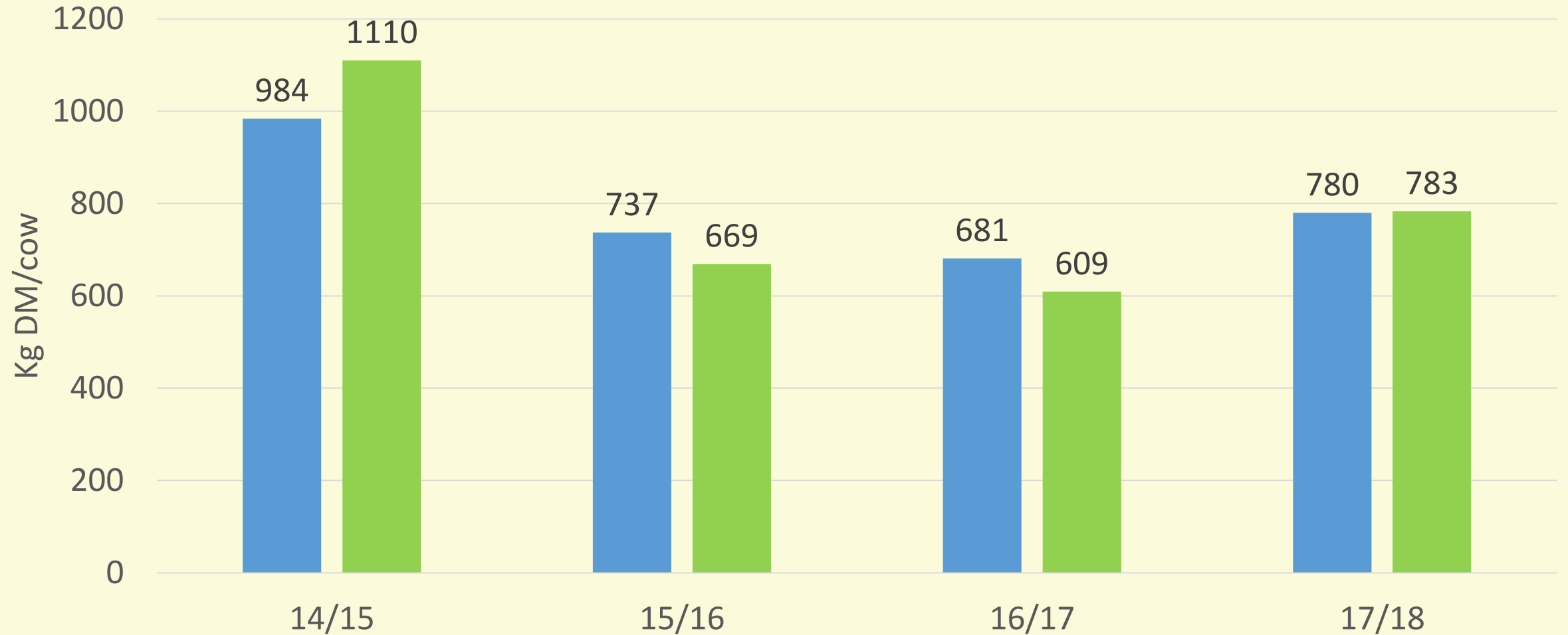
Average last 4 years
Whakapono – 1621 MS/ha
Waiora – 1573 MS/ha

■ Whakapono KA ■ Waiora Conv

Pasture Grown TDM



Supplement Use KgDM/cow



Average last 4 years

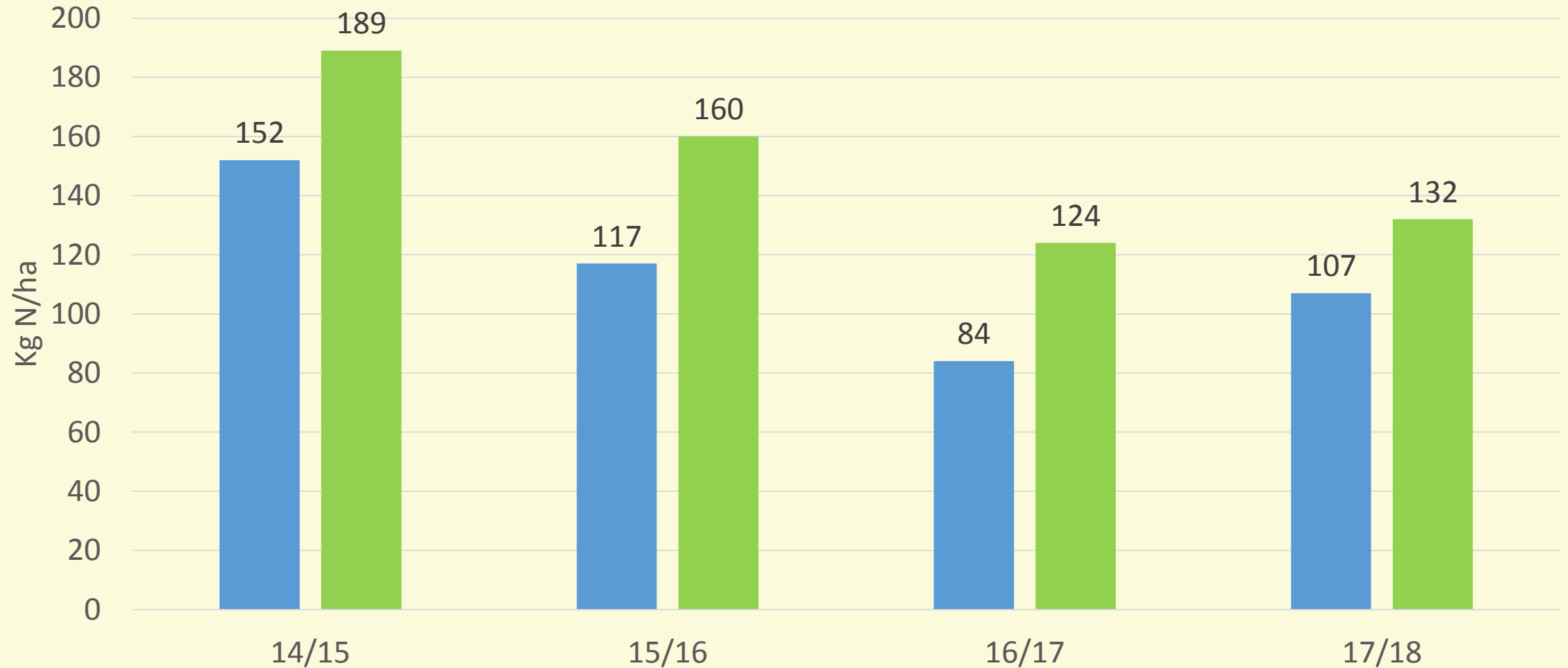
Whakapono – 796KgDM/cow

Waiora – 793KgDM/cow

■ Whakapono KA

■ Waiora Conv

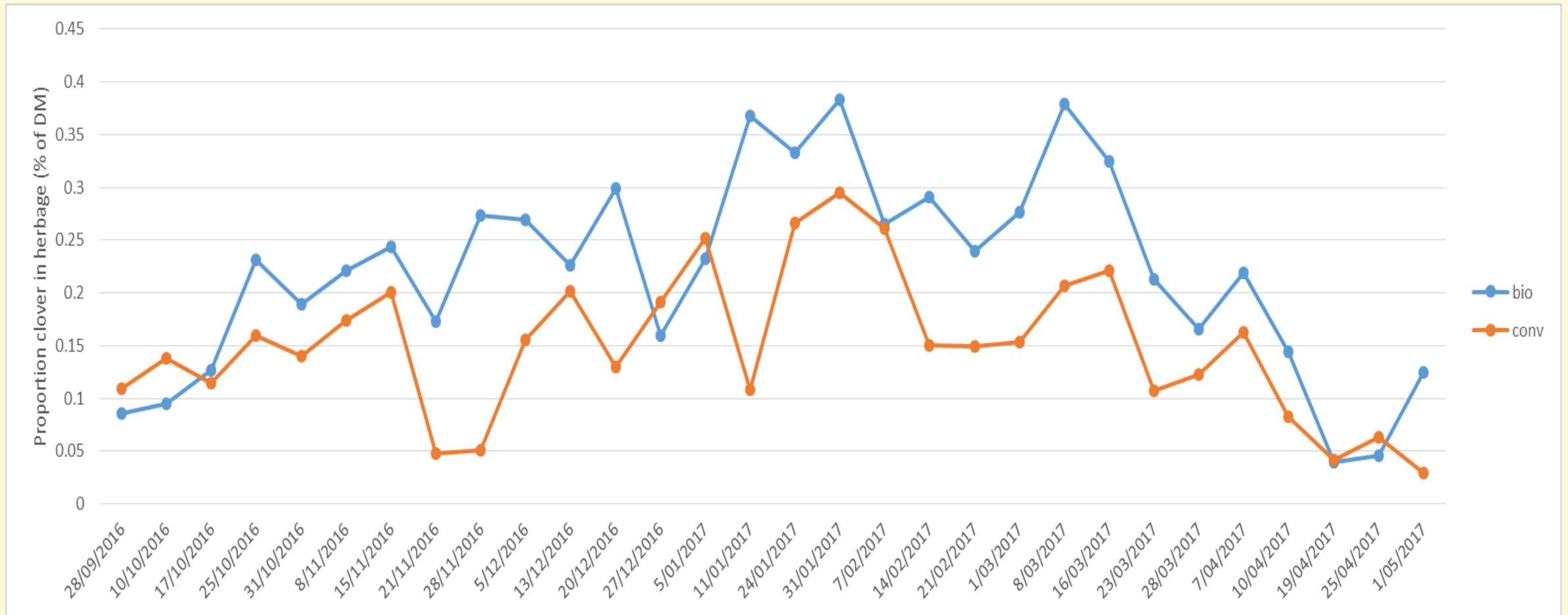
N applied/ha



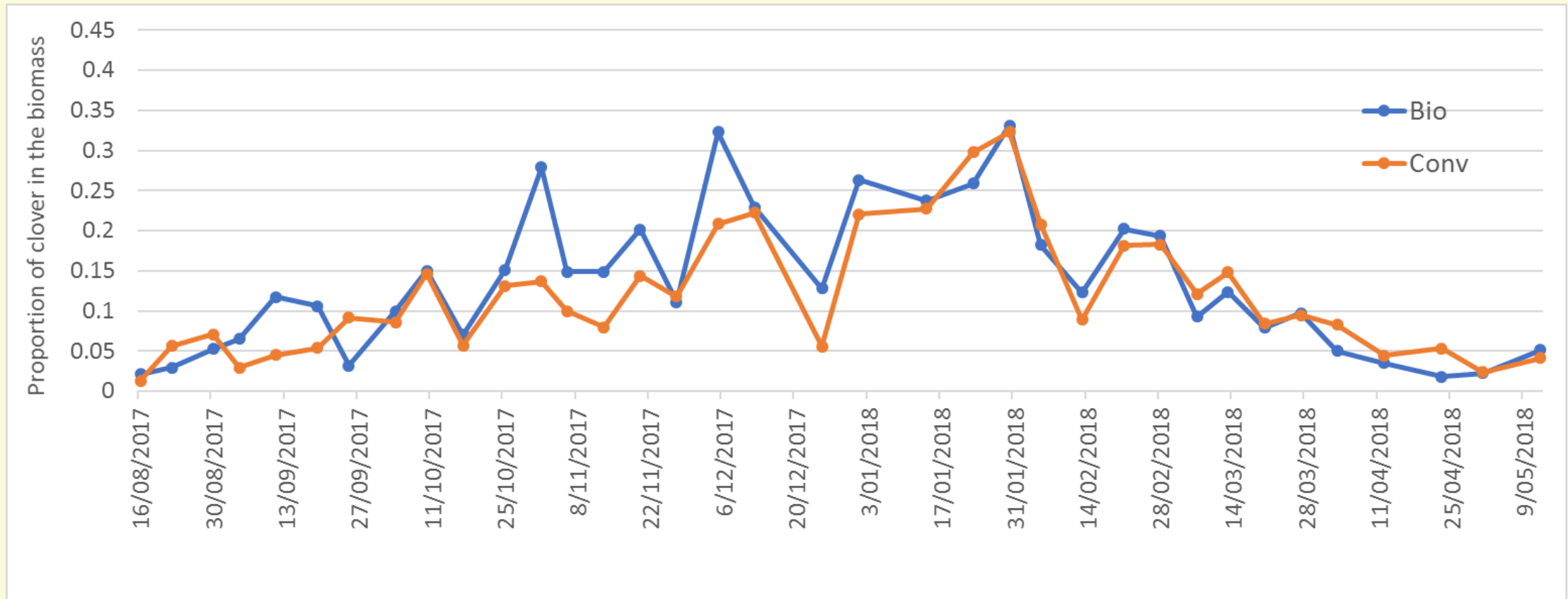
Average last 4 years
Whakapono – 115 KgN/ha
Waiora – 151 KgN/ha

■ Whakapono KA ■ Waiora Conv

In the 2016/2017 season there was more clover on the K-A farm which applied less N fertiliser



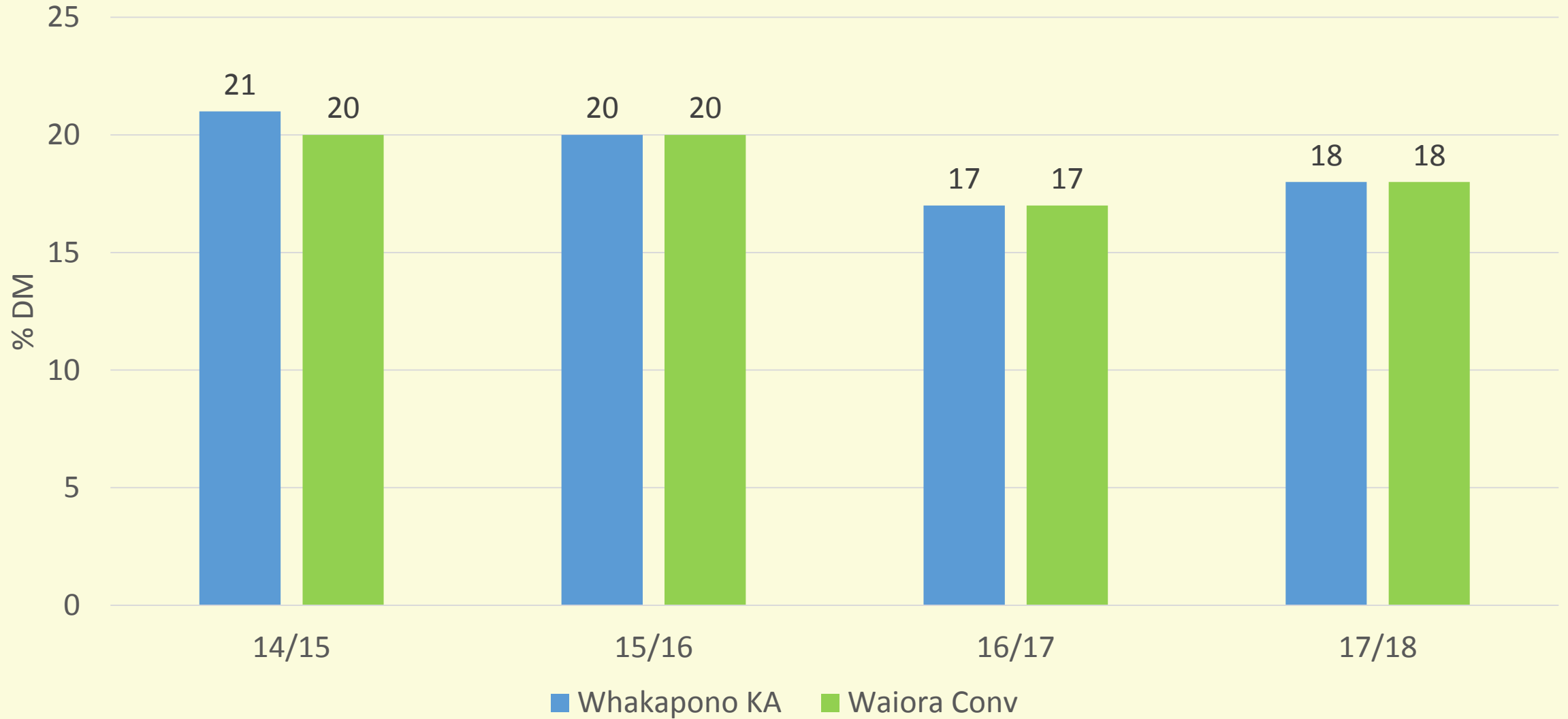
In the 2017/18 season there was less clover than previous year and no difference between farms



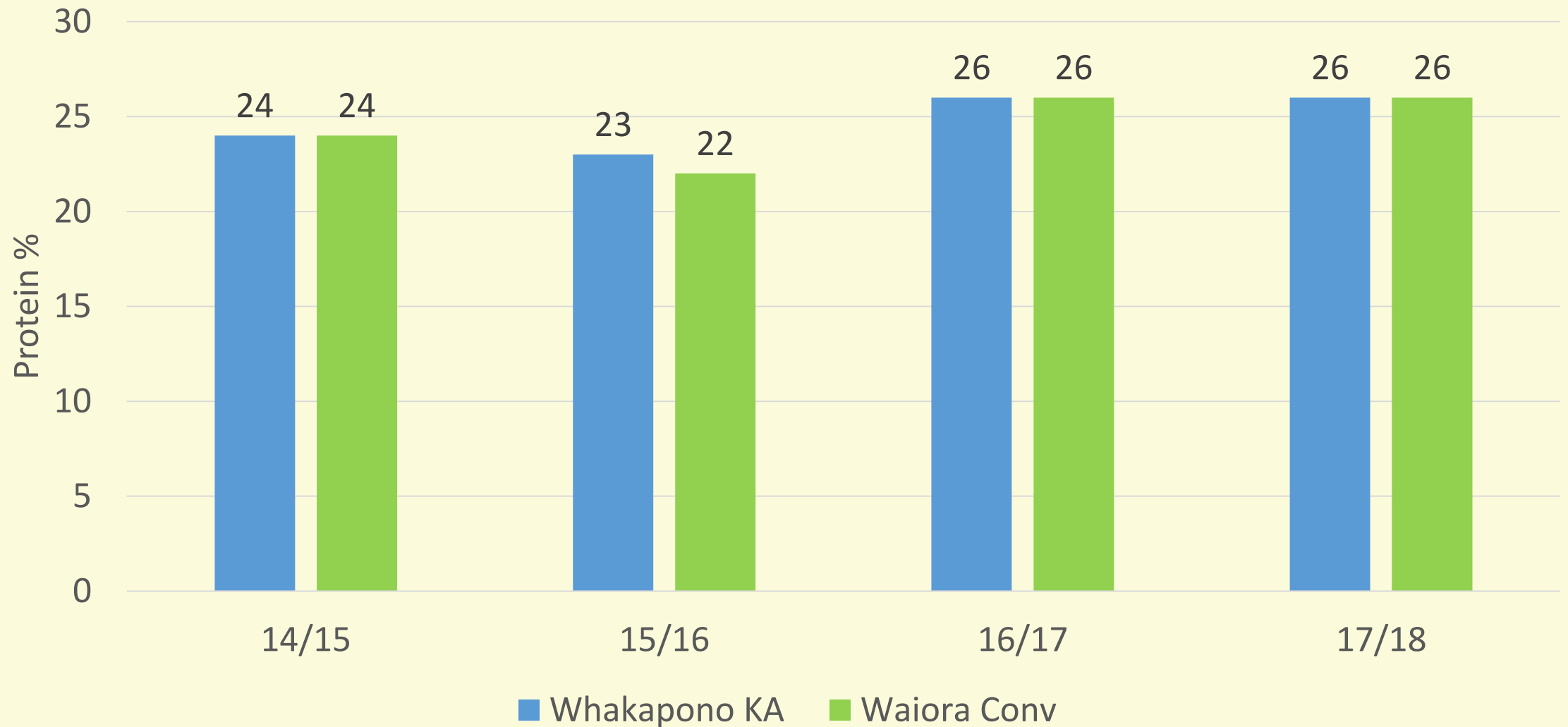
Summary

- Both farms using similar amounts of N fertiliser
- Difference in clover content between the two farms has disappeared
- Average clover % (period Aug 2017 to May 2018) was 13.3 vs 11.8 ± 0.7 ($P = 0.36$) for KA and Conv respectively
- There was no significant interaction between fertiliser treatment and season on clover content

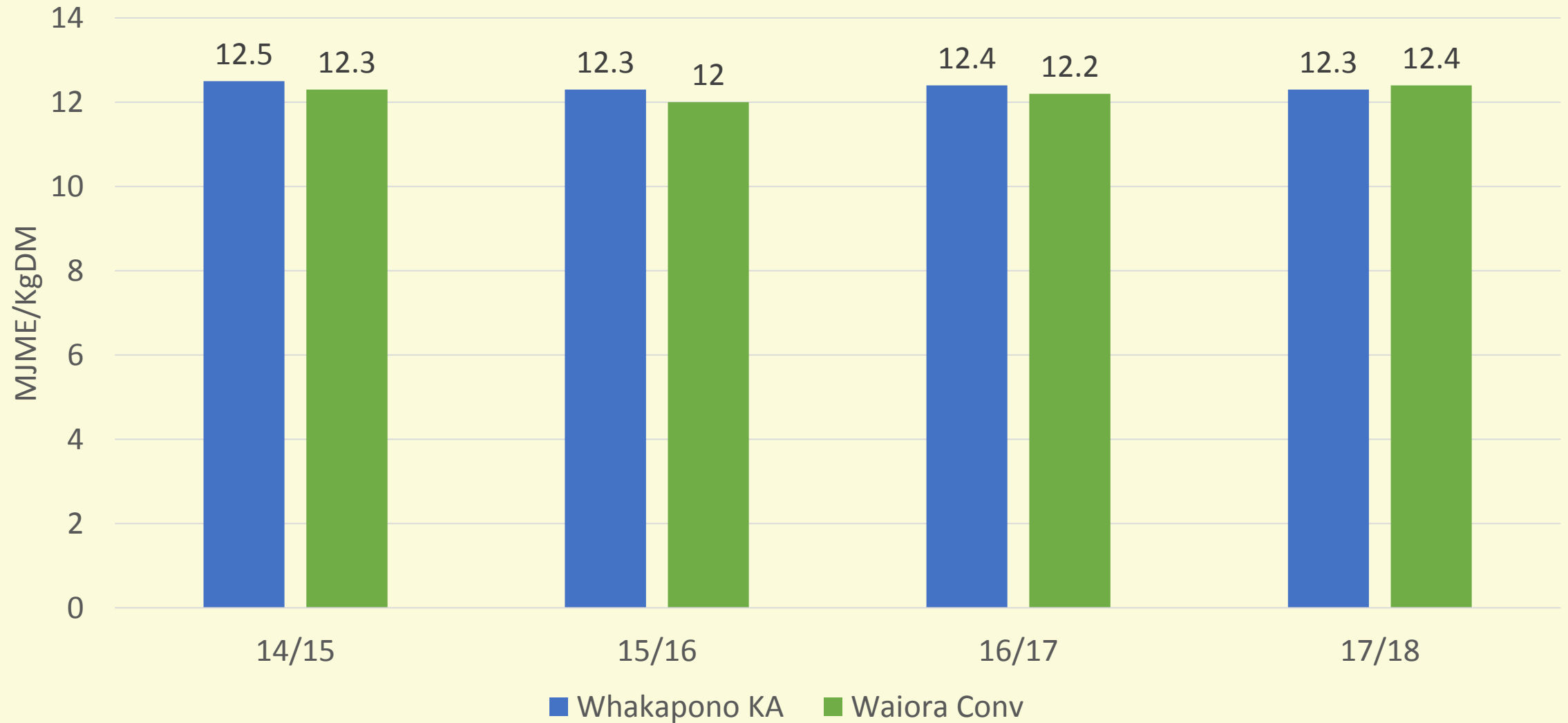
Pasture Quality DM%



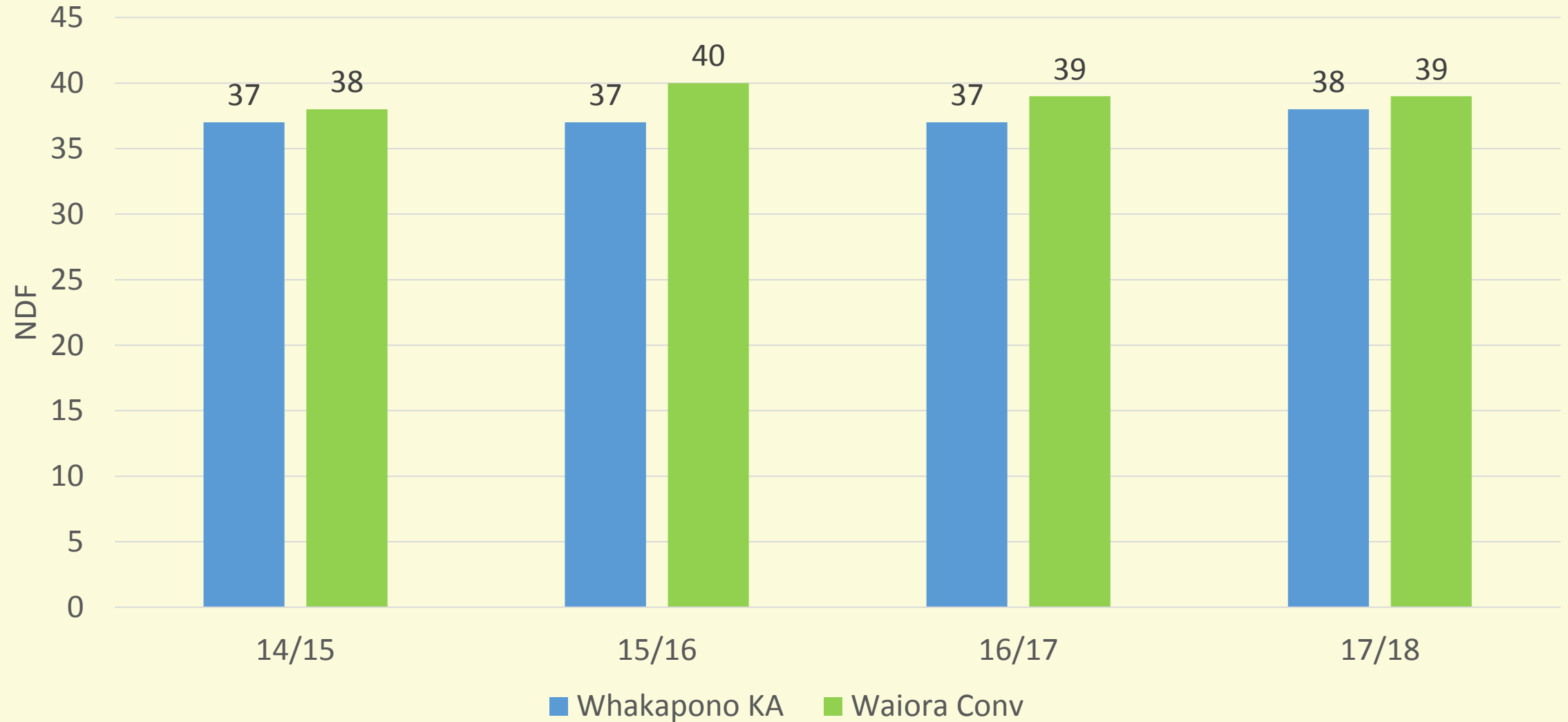
Pasture Quality Protein %



Pasture Quality MJME/KgDM



Pasture Quality NDF %



Pasture Quality

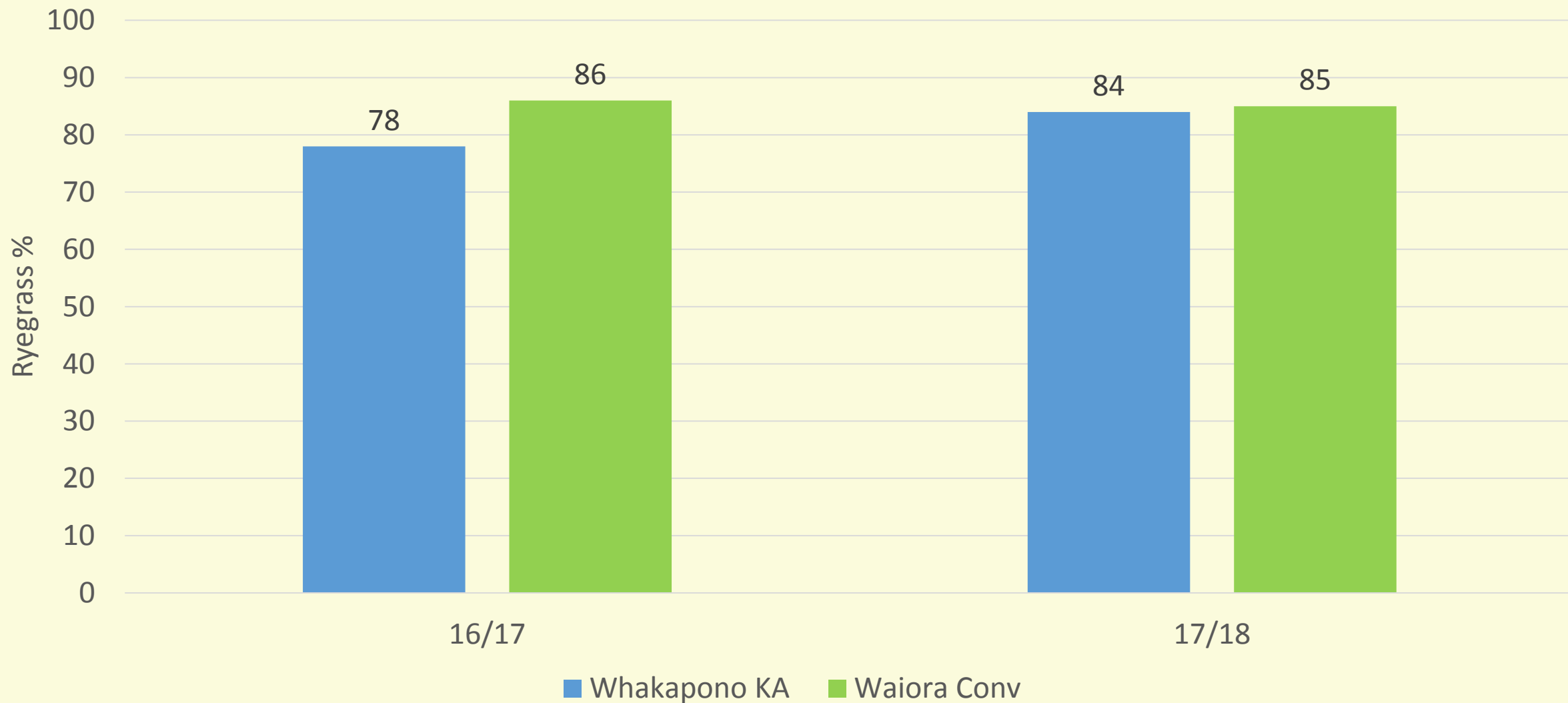
Average for Season – Whakapono - KA	14/15	15/16	16/17	17/18
DM %	21	20	17	18
Metabolisable Energy (MJ/KgDM)	12.5	12.3	12.4	12.3
Protein %	24	23	26	26
NDF %	37	37	37	38
Soluble Sugars	13	13	11	11

Average for Season – Waiora - Conv	14/15	15/16	16/17	17/18
DM %	20	20	17	18
Metabolisable Energy (MJ/KgDM)	12.3	12.0	12.2	12.4
Protein %	24	22	26	26
NDF %	38	40	39	39
Soluble Sugars	13	12	10	11

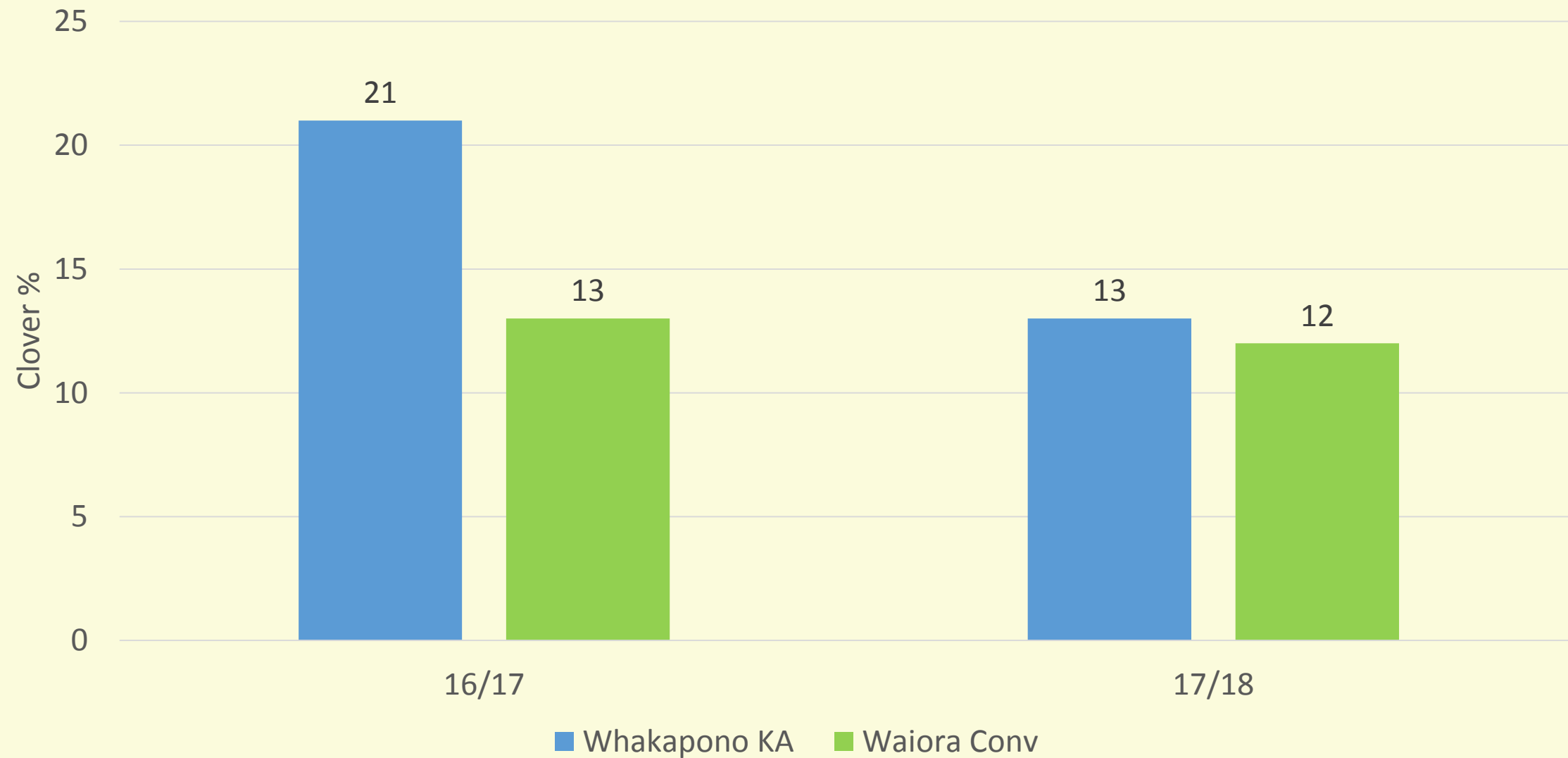
Botanical Composition

	Whakapono - KA 16/17	Waiora - Conv 16/17	Whakapono - KA 17/18	Waiora - Conv 17/18
DM %	19	18	19	19
Ryegrass (%DM)	78	86	84	85
Clover (%DM)	21	13	13	12
Weeds (%DM)	0.4	1	1	2
Herbs (%DM)	0.5	0.4	1	1

Pasture Quality Ryegrass %



Pasture Quality Clover %



Pasture Quality – February 2016

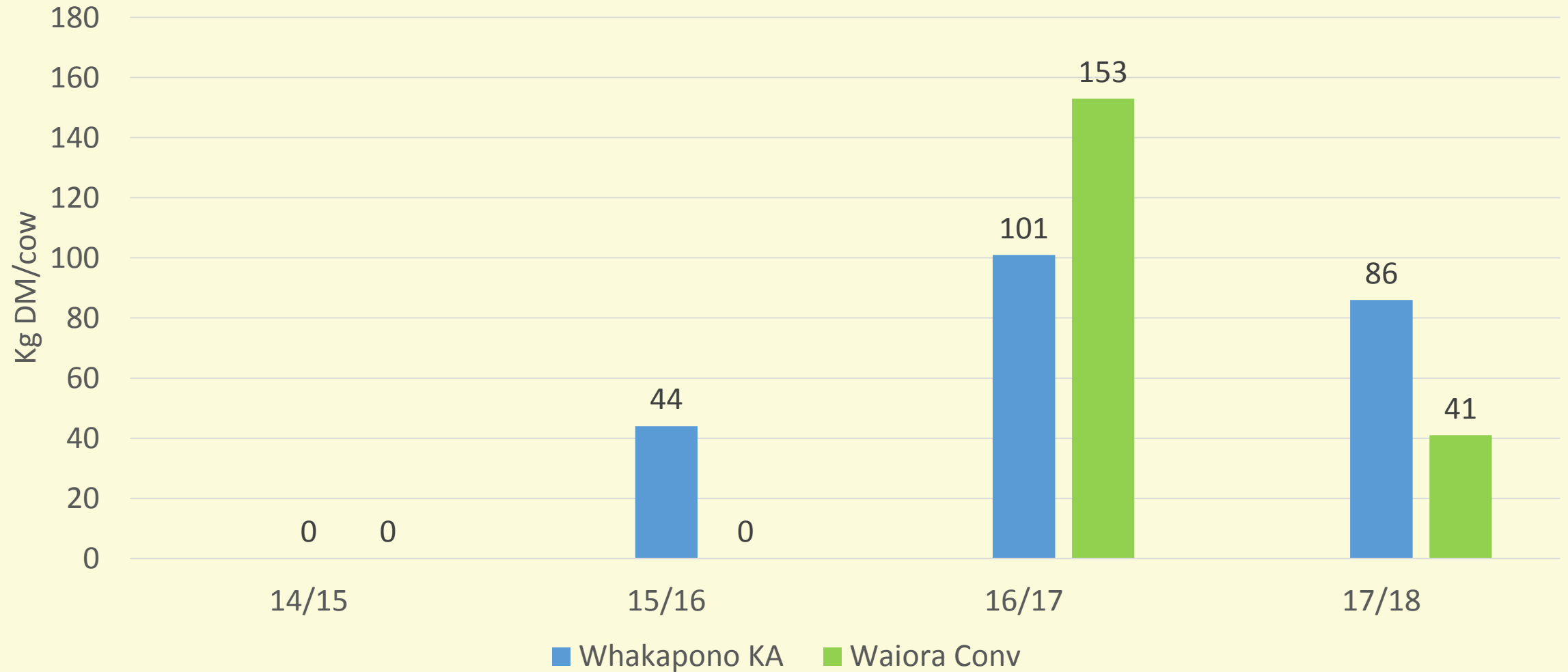


Whakapono - KA



Waiora - Conv

Supplements made on farm KgDM/cow



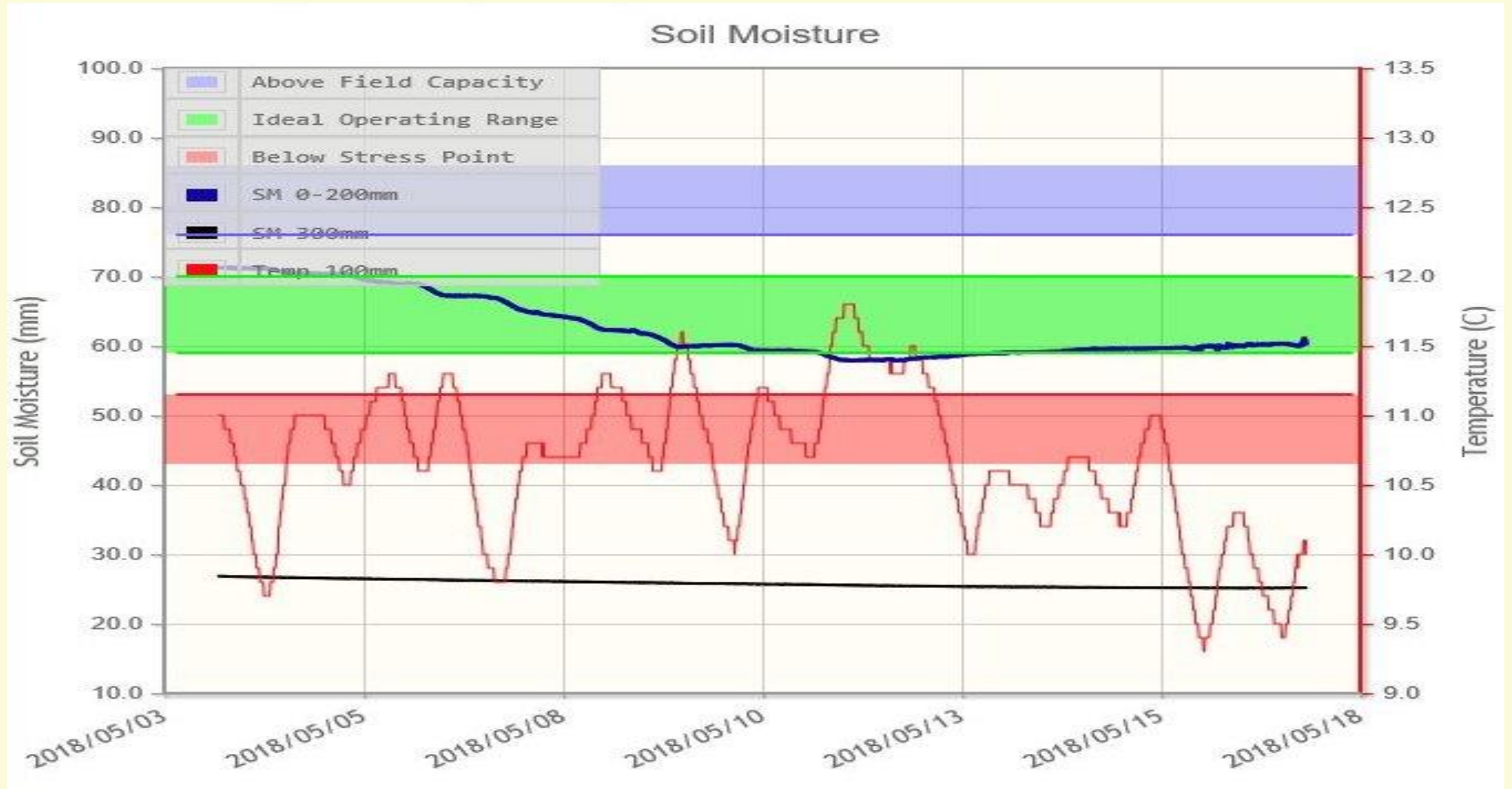
Water Inputs

over the last 3 seasons June to May

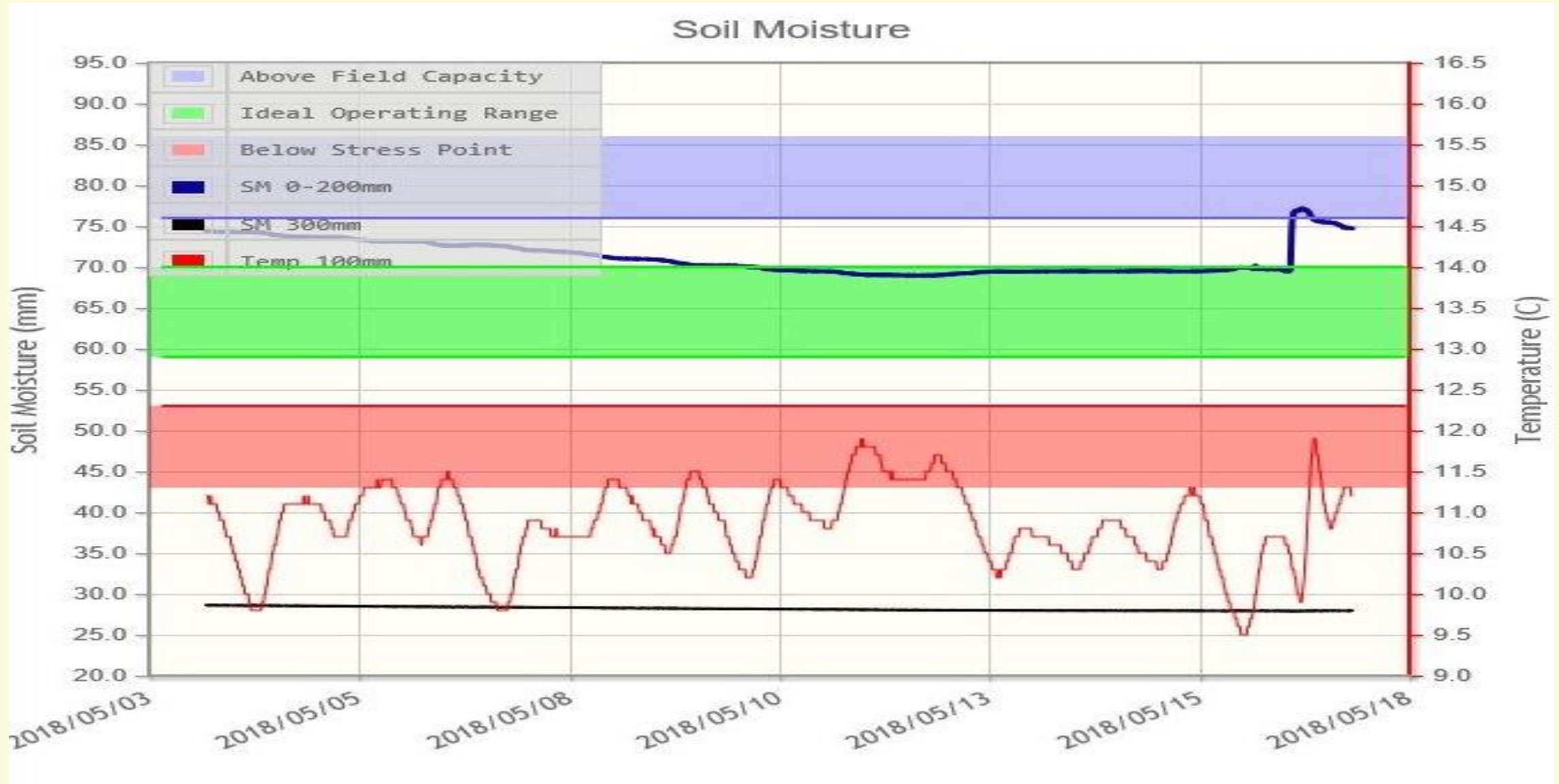
Whakapono - KA	14/15	15/16	16/17	17/18
Rainfall	388 (from 24 Aug)	625	891	1136
Irrigation		537	262	351
Total Water Inputs		1162	1153	1488

Waioira - Conv	14/15	15/16	16/17	17/18
Rainfall	388 (from 24 Aug)	625	891	1136
Irrigation		573	275	382
Total Water Inputs		1198	1166	1518

Soil Moisture – Whakapono - KA



Soil Moisture – Waiora - Conv



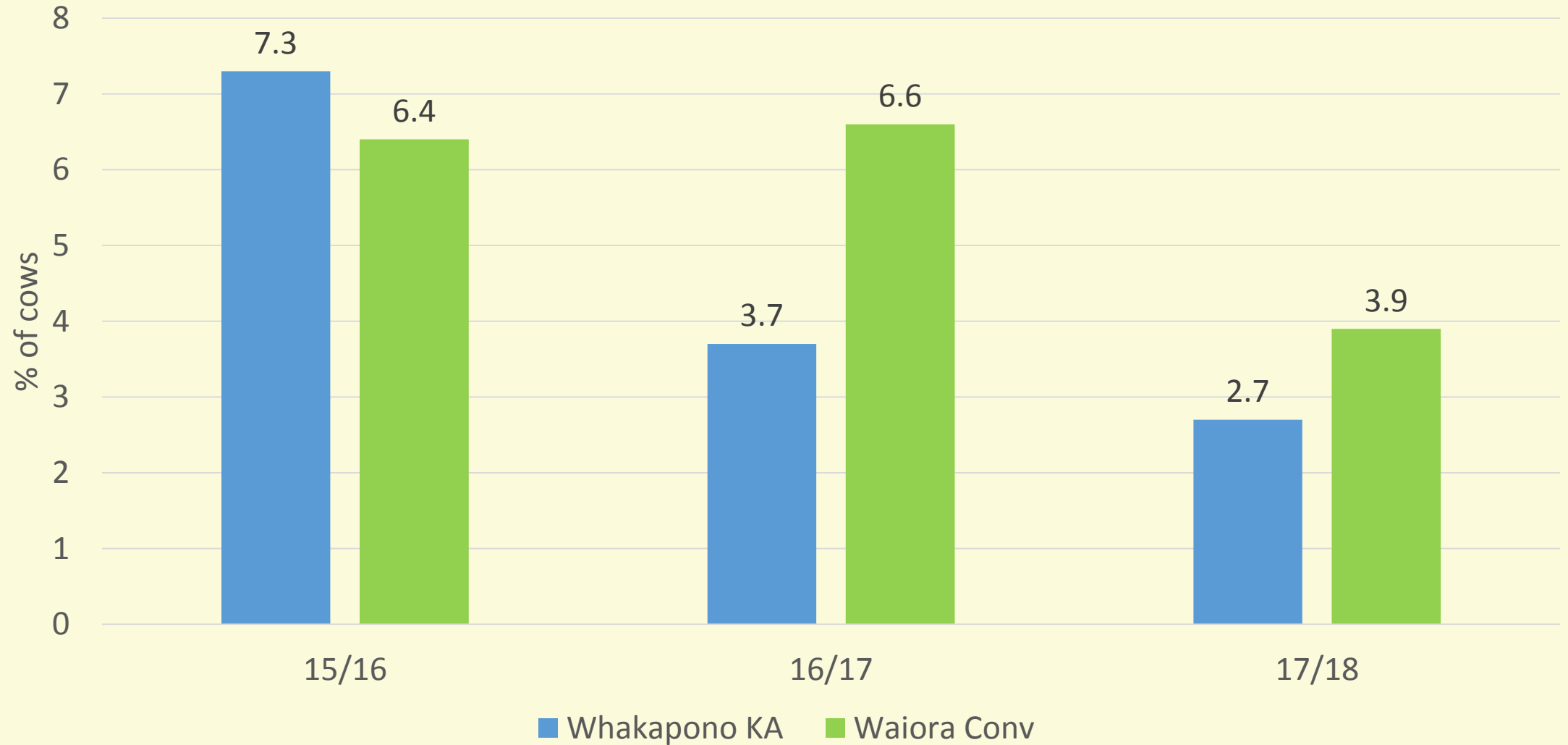
Animal Health – Downer Cows

Whakapono - KA	15/16	16/17	17/18
% of Cows at Calving time	7.3	3.7	2.7
% of Cows for Rest of Season	0.4	1.7	0.6
% of Cows All of the Season	7.7	5.4	3.3

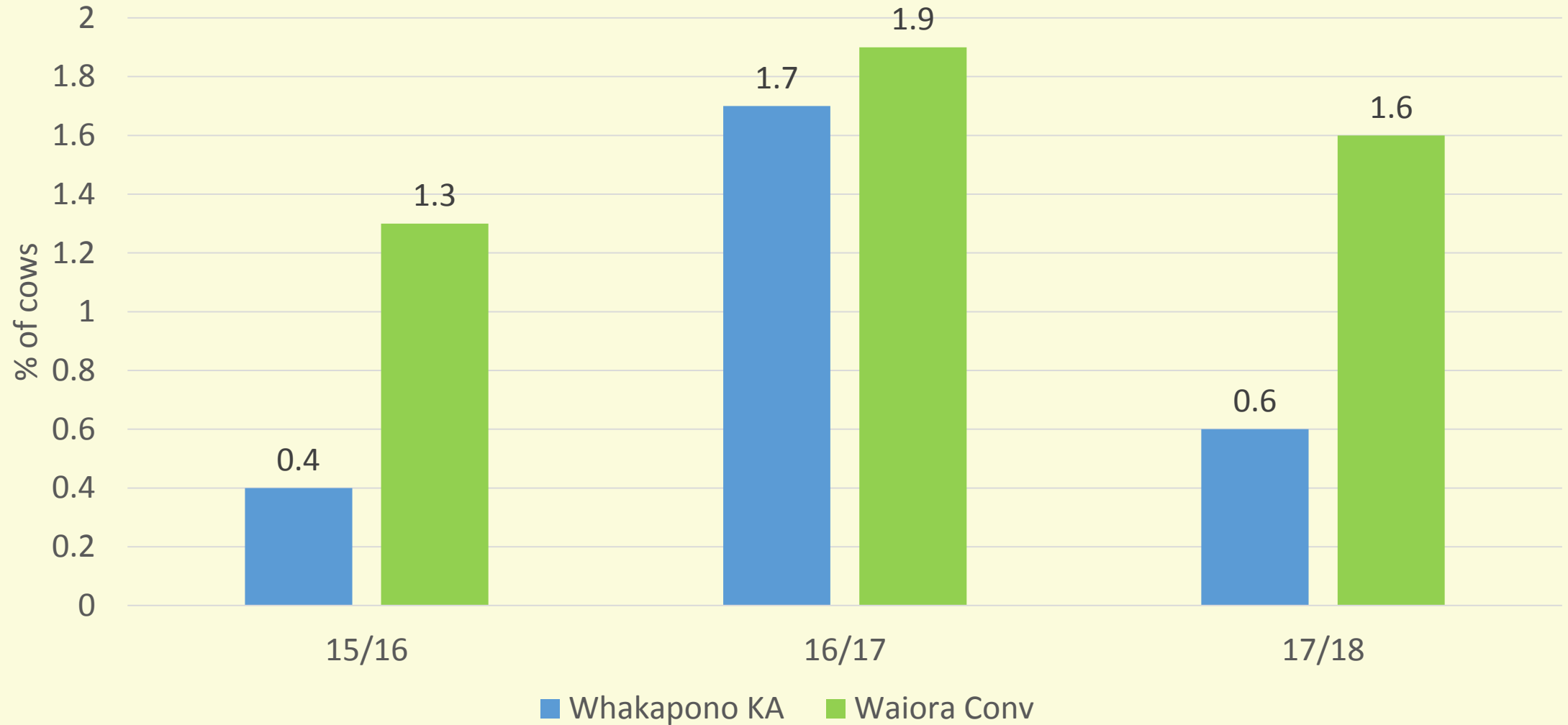
Waiora - Conv	15/16	16/17	17/18
% of Cows at Calving time	6.4	6.6	3.9
% of Cows for Rest of Season	1.3	1.9	1.6
% of Cows All of the Season	7.7	8.5	5.5

Farms were not statistically different

Downer Cows at Calving



Downer Cows for the rest of the season



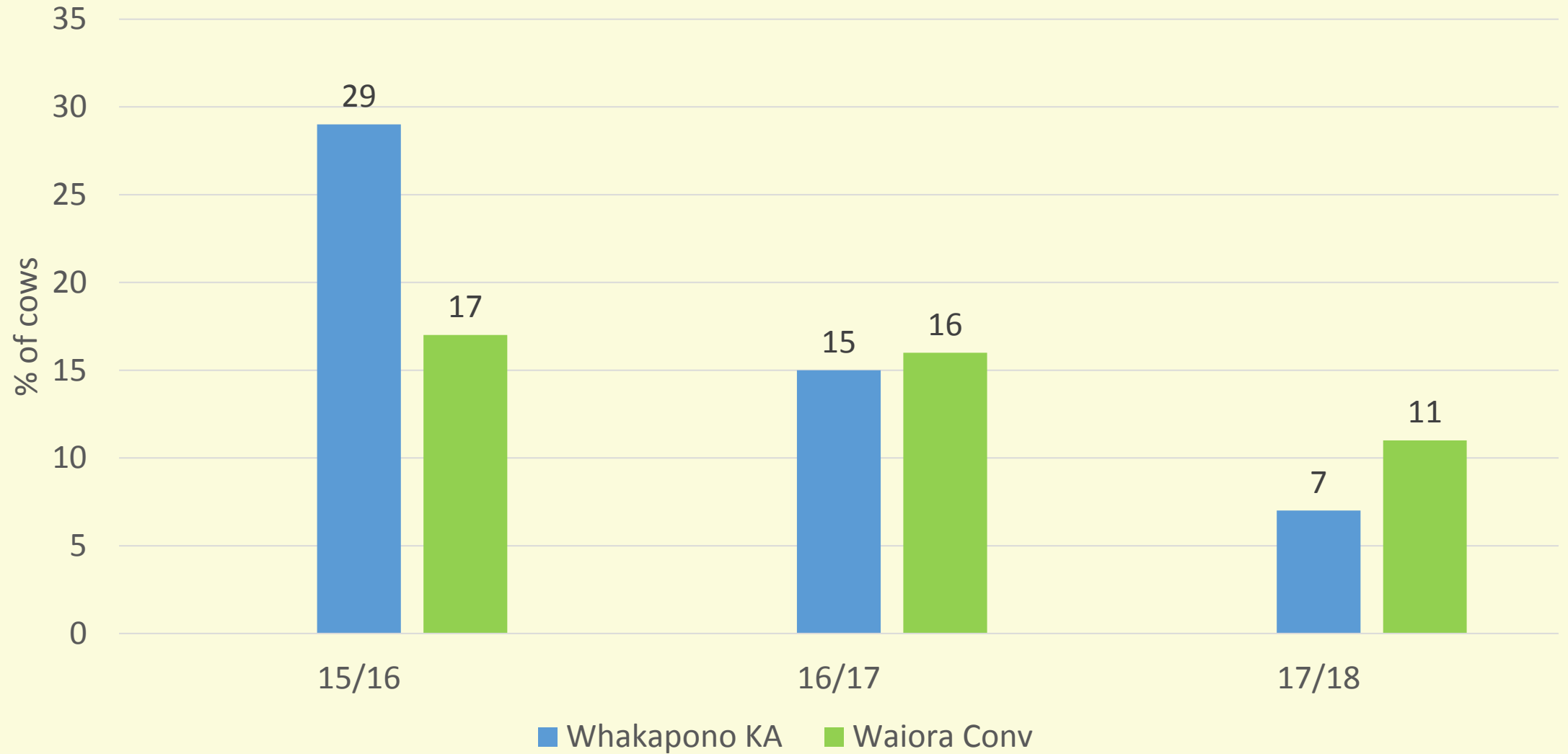
Animal Health - % of herd

Whakapono - KA	15/16	16/17	17/18
Lameness	29	15	7
Mastitis	11	10	13
Deaths	3	2	3
Culls	24	14	10

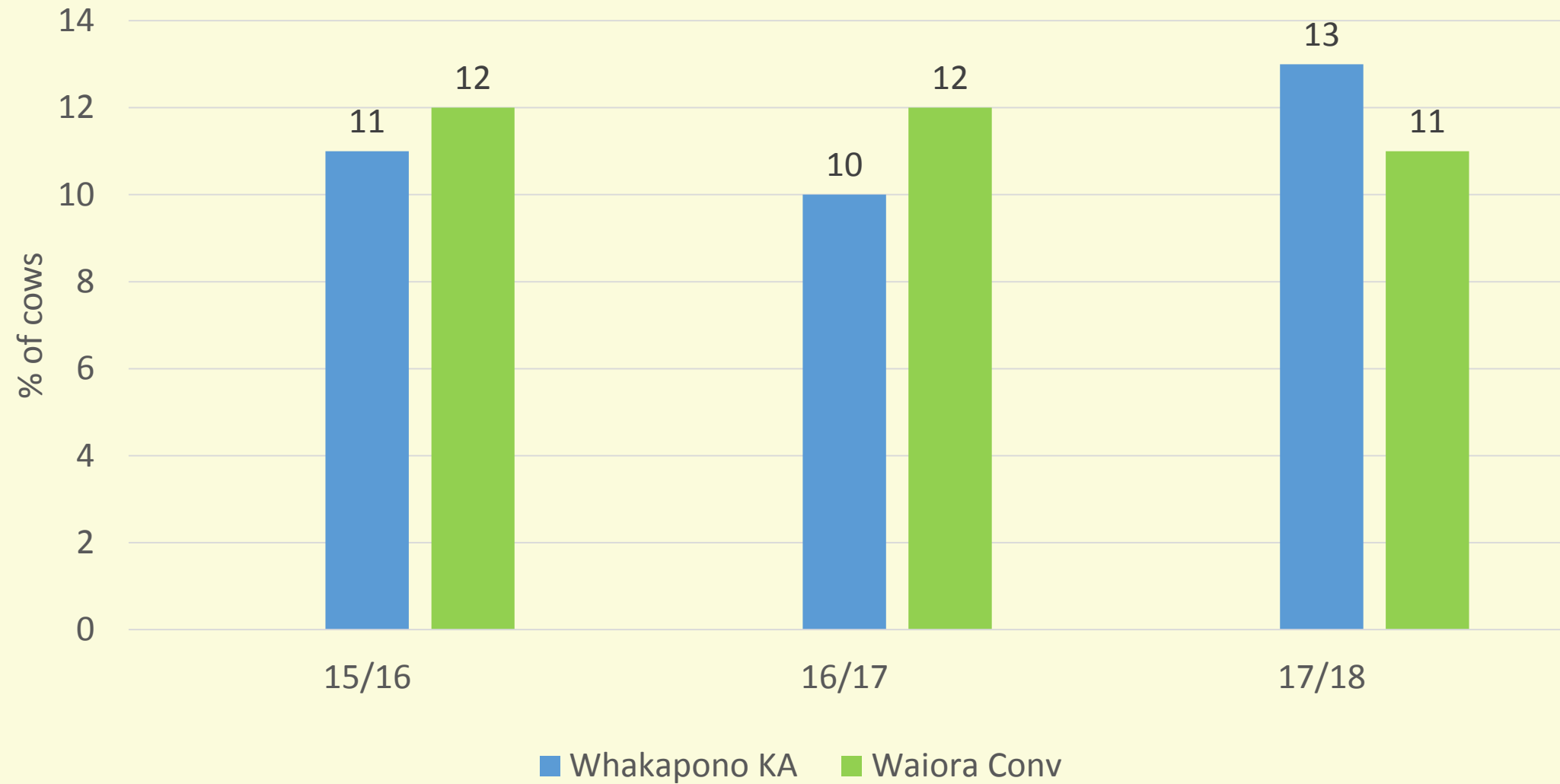
Waiora - Conv	15/16	16/17	17/18
Lameness	17	16	11
Mastitis	12	12	11
Deaths	2	4	3
Culls	24	16	11

No statistical difference between the two farms across the three years

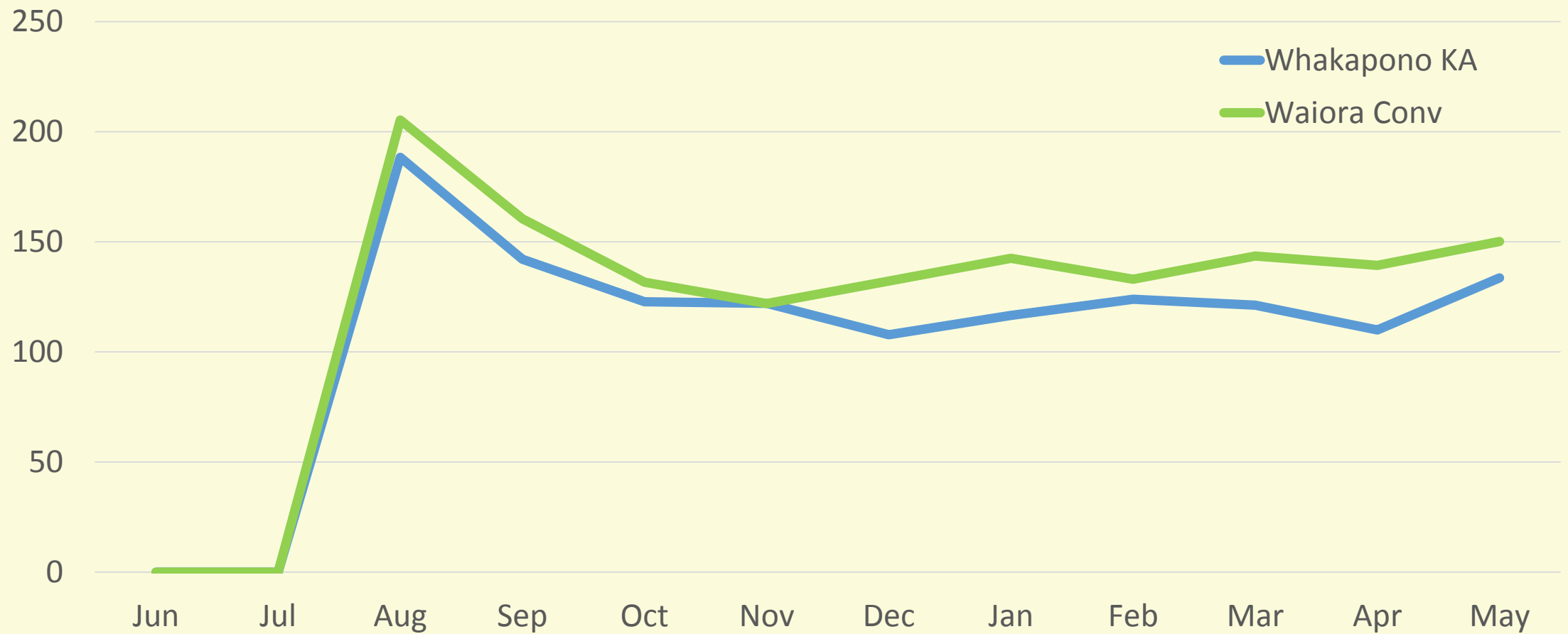
Lameness



Mastitis



SCC



Average
Whakapono – 129
Waiora – 146

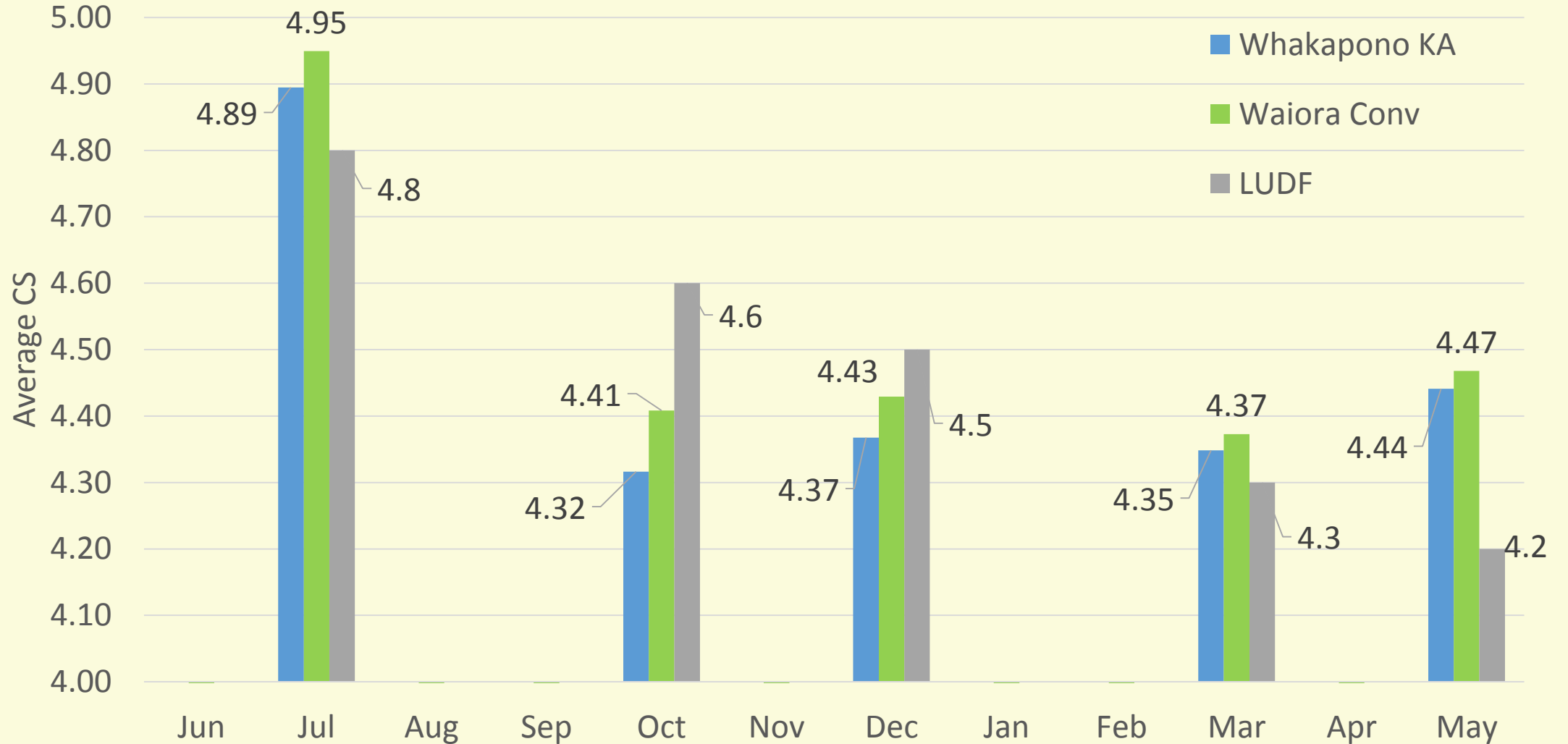
Reproduction

Whakapono - KA	14/15	15/16	16/17	17/18
3 week Submission Rate	92	91	91	85
Non Cyclers	8	9	9	15
MT Rate	8	13	14	11

Waiora - Conv	14/15	15/16	16/17	17/18
3 week Submission Rate	89	88	87	86
Non Cyclers	11	12	13	14
MT Rate	10	15	15	13

No statistical difference between the two farms across the four years

Average BCS



Soils Tests – Monitor Paddocks 16/17 Season

Hills	Whakapono	Waiora
PH	6.3	6.2
Olsen P	14	16
S	19	11
K	6	8
Ca	9	10
Mg	29	17
Na	3	4

Kinsey Albrecht	Whakapono	Waiora
PH	6.1	6.2
Total Exchange Capacity	11.4	10.7
Calcium %	64	71
Magnesium %	14	8
Potassium %	2.4	3.5
Sodium %	0.9	1.1

Soils Tests – Monitor Paddocks 17/18 Season

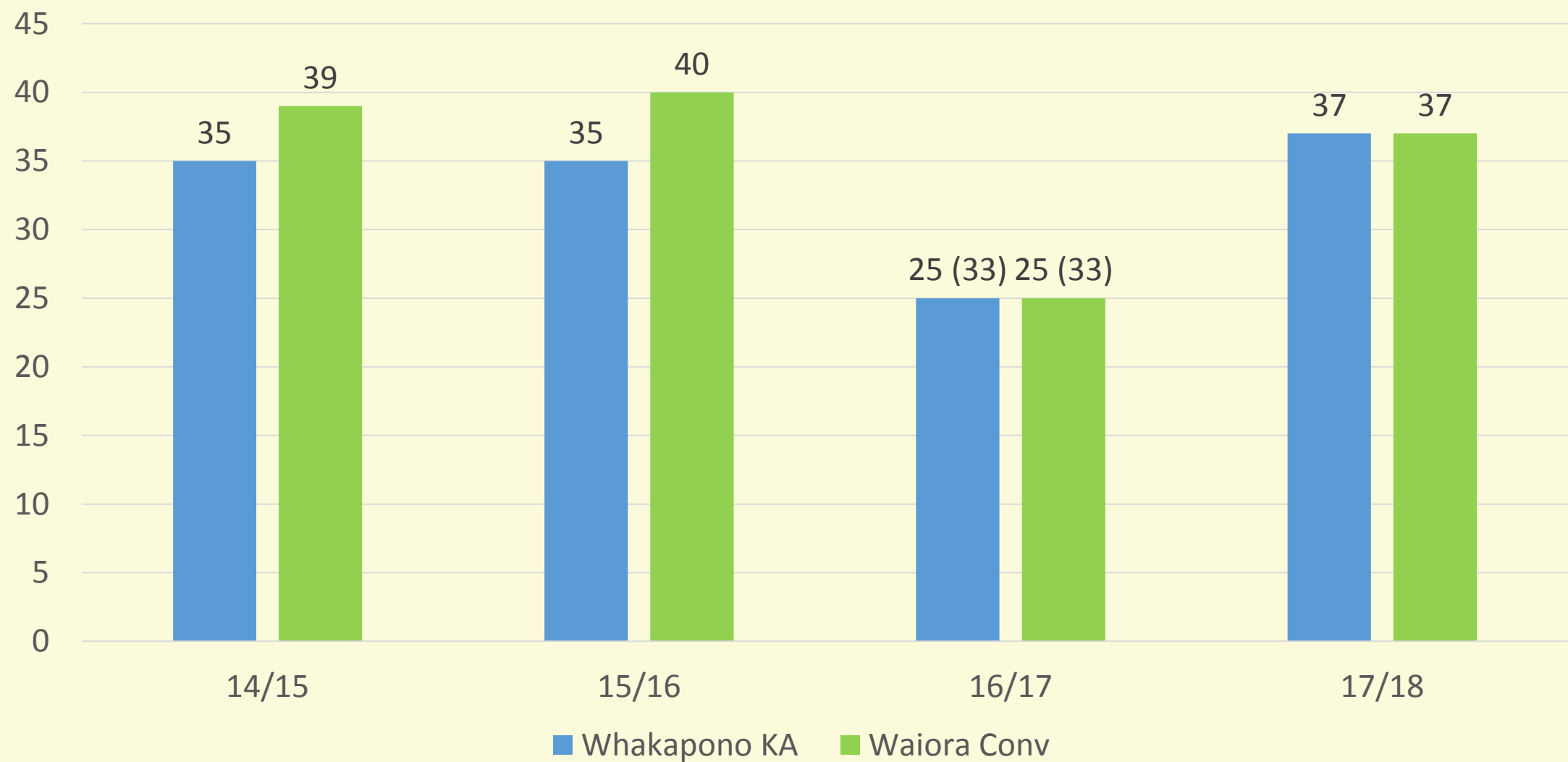
Hills	Whakapono	Waiora
PH	6.4	6.2
Olsen P	15	19
S	15	10
K	6	8
Ca	9.5	9
Mg	31	18
Na	1	2

Kinsey Albrecht	Whakapono	Waiora
PH	6.4	6.4
Total Exchange Capacity	10.9	10.5
Calcium %	68.5	73.2
Magnesium %	13.6	8.4
Potassium %	3.2	2.9
Sodium %	0.8	1.0

Nutrients Applied

17-18	N	P	K	S	Ca	Mg
Whakapono – KA	107	32	98	194	200	0
Waiora - Conv	132	42	60	72	103	30
16-17	N	P	K	S	Ca	Mg
Whakapono – KA	84	35	90	116	522	64
Waiora - Conv	124	51	50	59	50	0
15-16	N	P	K	S	Ca	Mg
Whakapono – KA	117	27	42	113	923	123
Waiora - Conv	160	37	67	94	90	27

Overseer N Leaching



Overseer Nutrient Budgets															
Whakapono		(kg/ha/yr)						Waiora		(kg/ha/yr)					
	N	P	K	S	Ca	Mg	Na		N	P	K	S	Ca	Mg	Na
Nutrients Added								Nutrients Added							
Fertiliser, lime and other	115	39	92	201	74	4	0	Fertiliser, lime and other	124	40	57	68	98	29	0
Rain/clover N Fixation	168	0	2	4	2	4	20	Rain/clover N Fixation	157	0	2	4	2	4	20
Irrigation	7	0	6	9	34	8	34	Irrigation	9	0	6	9	35	8	36
Supplements imported	45	8	31	5	6	4	2	Supplements imported	44	8	31	5	6	4	2
Nutrients Removed								Nutrients Removed							
As products	97	16	23	5	21	2	7	As products	94	16	23	5	20	2	7
Exported effluent	0	0	0	0	0	0	0	Exported effluent	0	0	0	0	0	0	0
As supplements	0	0	0	0	0	0	0	As supplements	0	0	0	0	0	0	0
To atmospheric	90	0	0	0	0	0	0	To atmospheric	92	0	0	0	0	0	0
To water	37	1	17	218	49	5	16	To water	37	1.1	14	86	50	5	17
Change in internal pools								Change in internal pools							
Plant material	5	1	5	1	1	0	0	Plant material	3	0	2	0	1	0	0
Organic pool	109	15	4	-4	1	1	0	Organic pool	108	15	4	-5	1	0	0
Inorganic mineral	0	1	-11	0	-2	-3	-3	Inorganic mineral	0	1	-14	0	-2	-3	-3
Inorganic soil pool	0	14	91	0	42	16	36	Inorganic soil pool	0	15	66	0	71	41	37

The New Zealand Institute for Plant & Food Research Limited

Plant & Food
RESEARCH
RANGAHAU AHUMĀRA KAI



Soil Nutrient Management in Dairy Farming Systems

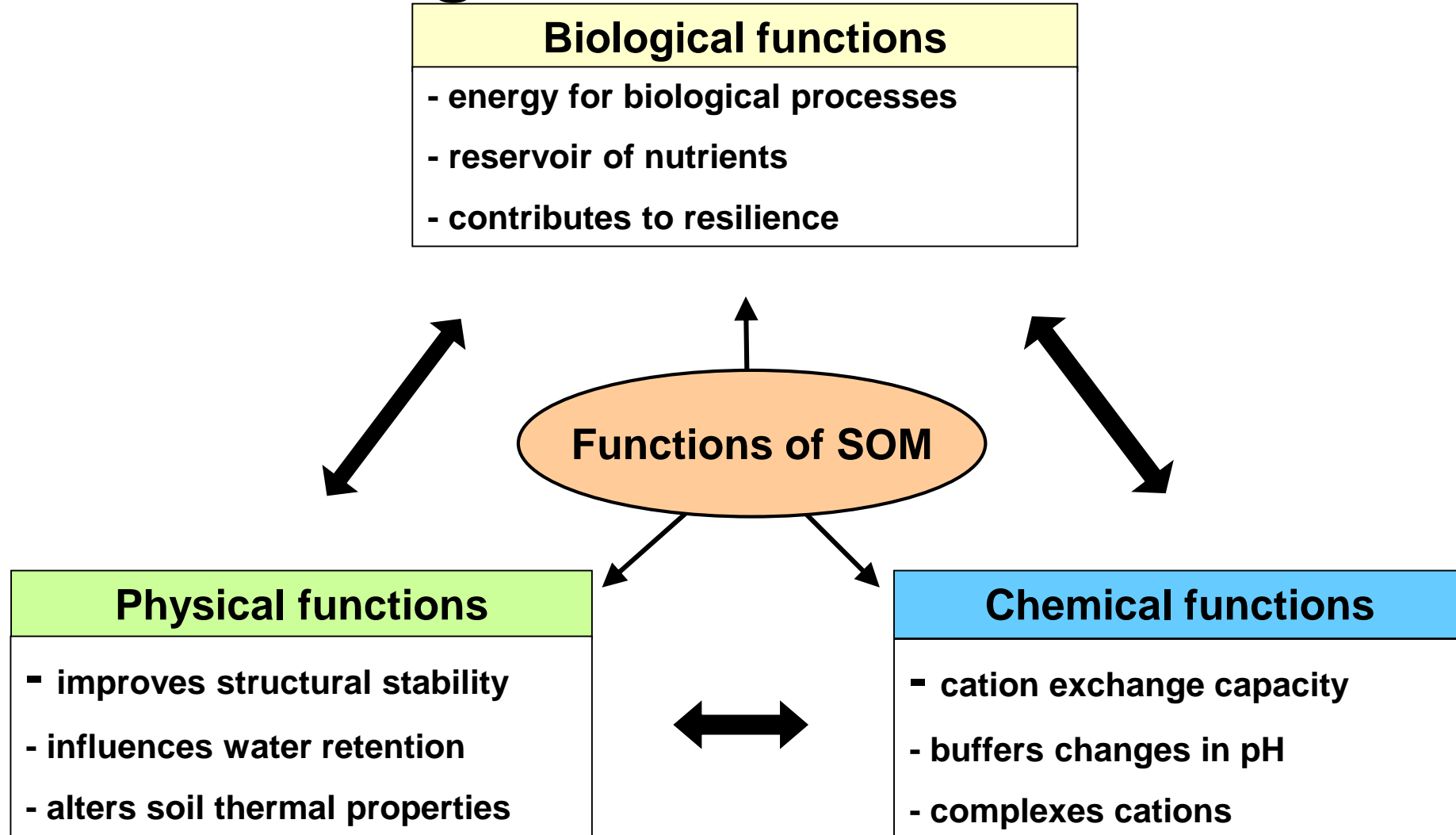
Prepared by:
Richard Gillespie

Soil



- **Healthy soil**
- continued capacity to sustain biological productivity and ecosystem function within land-use boundaries
- **Soil resilience**
- capability of a soil to return to its original state (recover) after being stressed or disturbed
- **Why is soil organic matter (SOM) important to healthy and resilient soils?**
- **How does SOM contribute to a healthy soil?**

Functions of organic matter in the soil



SOM



- Contributes to a range of important soil properties
- Management can alter the amount and distribution of different types of organic matter
- Organic matter contributes positively to many soil properties
- Changes in soil organic carbon and associated physical properties can be slow
- Biological and chemical properties may be more responsive to changes in management but differences need to be tracked over time (due to inherent variability)

The comparison



- Two farms, similar/same soil type, balanced for stock (age, condition, production, SR and BW), irrigated (SW monitored)
 - Three focus paddocks identified from each farm
- Albrecht-Kinsey 'biological' approach (South) (Whakapono) v. a 'best management practice' conventional approach (North) (Waioara)
- System differences
 - South: A-K focus on balancing nutrients with more emphasis on Mg, Ca etc
 - North: synthetic fertiliser
- The soil analysis measures the nutrients available to the plant from the soil by performing specific nutrient tests in a certain way

Methods



- Focus paddocks were chosen and paired, with as similar a cropping history as was possible.

Crop history prior to conversion					
New paddock ID	System	Pairing	2008-09	2009-10	2010-11
North 3	Conventional	A	Triticale (cut and carry)	Peas (seed)	Feed wheat
South 12	Biological	A	Pasture (short term?)	Milling wheat	Feed wheat
North 15	Conventional	B	<i>information not available</i>	<i>information not available</i>	Ryecorn (winter grazed)
South 19	Biological	B	Pasture/chicory mix	Chicory	Ryecorn (winter grazed)
North 22 (south end)	Conventional	C	<i>information not available</i>	Milling wheat	Clover
South 26	Biological	C	Pasture?	Clover	Wheat



Design limitations and statistics

- Paddocks are not replication. At best, only observational comparison of the two management systems.
- Very limited stats (t test: 2 tailed distribution, paired)
- No reason why we can't get good, useful information
- But need to bear in mind that it is observational and not replicated
- We can only say e.g. the A-K managed farm at site A was better/worse/different than the Conv. managed farm at site B.
- Trends over time are best indicator that something is happening



Soil measurements

- 3 measurements per focus paddock for most of the measurements
- Sampled at end of winter before first spring graze
- Each measurement site GPS plotted (reduces spatial variability)
- Aim is to monitor physical, chemical and biological changes over time for the two systems.

Physical measurements:



- In each focus paddock:
 - Penetration resistance: 15 readings at 0-10 and 10-20cm depths. Measures soil density and represents compaction.
 - Macroporosity and drained upper limit (DUL): 3 intact tension table cores to 7.5cm depth. Tension tables assess macroporosity as an indication of soils ability to drain efficiently. DUL gives field capacity (to determine water storage capacity).
 - Aggregate stability: 3 spade squares to 15cm for aggregate stability. Indicative of physical structure and stability of soil under physical forces such as cultivation, rainfall and stock treading (affected by organic matter in system).





- **Chemical**
- 20 cores to 15 cm over paddock W sampling pattern
- From this sample
 - Anaerobically mineralisable N: incubation process
 - Total C and N. These N measurements will be indicative of available N under the two cropping systems.
 - Hill Labs Basic Soil and $\text{SO}_4\text{-S}$.

biological measurements



- **Biological**

- 3 'farmer spades' per paddock 36 x 18 x 25 cm
 - Dissected for earthworms, clover root weevil, porina, grass grub and other critters
- Effect of management on biological indirect.



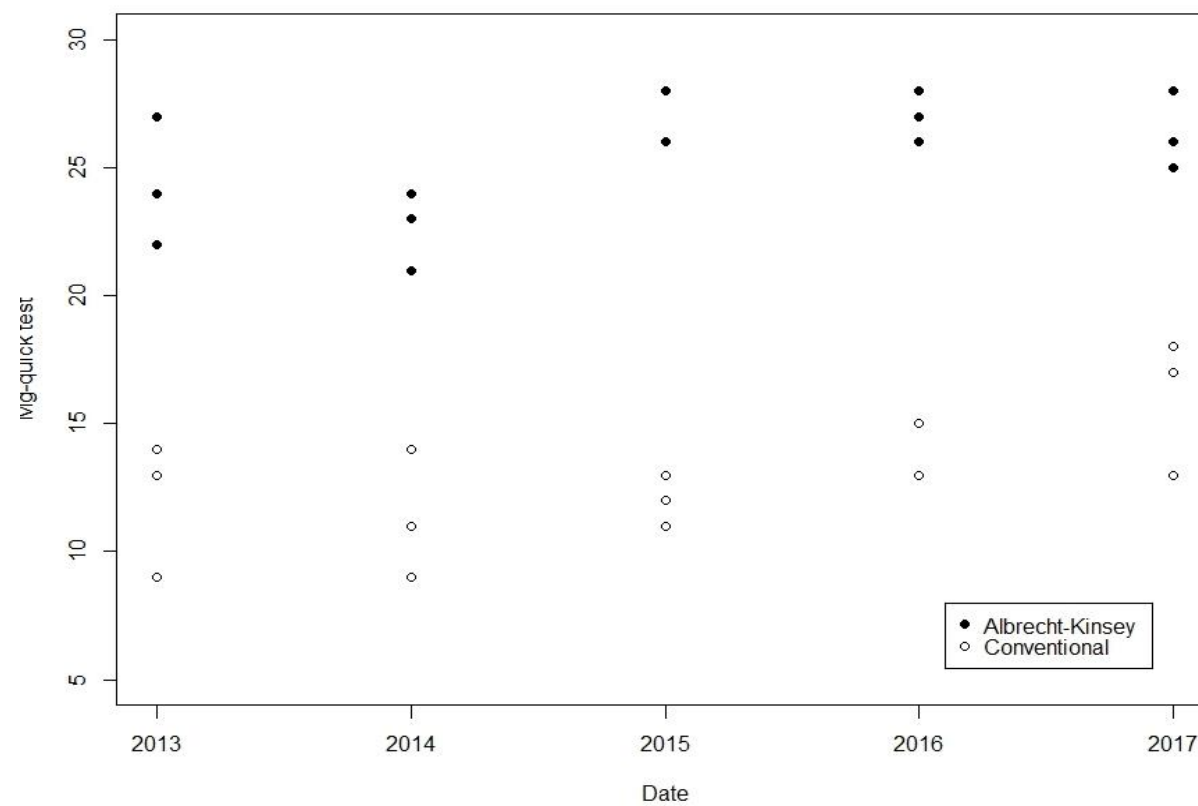
Results: “baseline” fertility (post conversion)



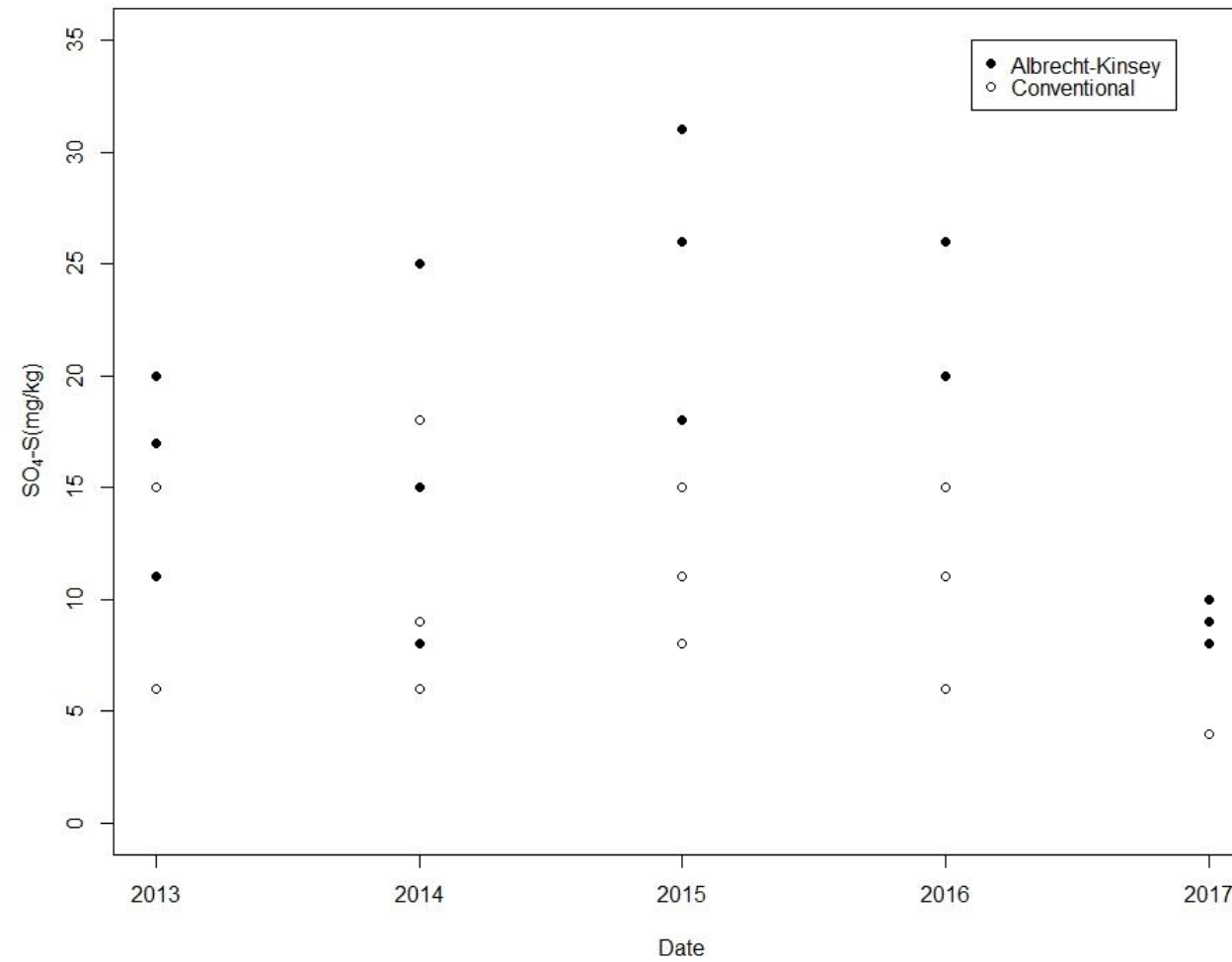
		2013 results (Hill Labs: Basic Soil + SO ₄ -S)						
Pdk	System	pH	Olsen P	S	K	Ca	Mg	Na
North 3	Conv	5.8	14	15	5	7	9	3
North 15	Conv	6.2	19	11	8	9	14	3
North 22 south	Conv	6.1	15	6	5	10	13	3
		6.1	16.0	10.7	6.0	8.7	12.0	3.0
South 19	A-K	6.2	15	11	4	9	27	3
South 26	A-K	6.2	14	17	7	9	24	2
South 12	A-K	6.0	23	20	7	8	22	2
		6.1	17.3	16.0	6.0	8.7	24.3	2.3

	Baseline 2013		Year 2 2015		Year 3 2016		Year 4 2017	
	Conv	A-K	Conv	A-K	Conv	A-K	Conv	A-K
AMN (ug/g)	82.7	79.2	71.8	81.4	99.8	102.5	100.1	91.6
Soil moisture (%w/w)	24.7	25.0	30.9	29.9	31.5	32.3	33.6	33.7
Organic C (%)	2.7	2.9	2.7	2.9*	2.8	3.0*	2.9	2.9
Total N (%)	0.26	0.27	0.26	0.28*	0.27	0.28	0.28	0.27
Soil pH	6.0	6.1	6.3	6.1	6.1	6.0	6.3	6.3
Olsen P (mg/L)	16.0	17.3	13.7	12.7	14.3	13.7	15.7	11.6
CEC (me/100g)	14.7	15.0	14.0	14.7	14.7	15.0	14.7	14.3
SO ₄ -S (mg/kg)	10.7	16.0	11.3	25.0*	10.7	22.0*	5.3	9.0*
K (MAF)	6.0	6.0	4.7	6.3	5.0	3.7	4.7	6.0
Ca (MAF)	8.7	8.7	9.7	8.3	9.7	8.7*	8.7	7.7
Mg (MAF)	12.0	24.3*	12.0	26.7*	14.3	27.0*	16.0	26.3*
Na (MAF)	3.0	2.3	2.3	2.2	3.3	3.0	3.0	2.0

Magnesium



Sulphur



Physical measurements



	Baseline 2013		Year 2 2015		Year 3 2016		Year 4 2017	
	Conv	A-K	Conv	A-K	Conv	A-K	Conv	A-K
0-10 cm penetration resistance (MPa)	2.2	2.2	1.6	1.6	1.2	1.3	1.3	1.1
10-20 cm penetration resistance (MPa)	2.0	2.1	1.9	1.8	2.1	1.7*	1.6	1.4
0-7.5 cm DUL moisture content (% v/v @ -10kPa)	40.5	40.8	43.9	43.5	42.4	42.2	44.0	45.7
0-7.5 cm Macro Porosity (% v/v @ -10kPa)	8.3	8.9	9.7	11.0	13.1	14.9	15.2	12.9
Aggregate stability (mm, MWD)	1.8	1.8	2.0	2.1	2.0	2.1*	2.1	1.9
Aggregate stability (% >1 mm)	66	66	78	80	77	83*	79	74

Biological measurements



	Baseline 2013		Year 2 2015		Year 3 2016		Year 4 2017	
	Conv	A-K	Conv	A-K	Conv	A-K	Conv	A-K
Earthworms per m²	452	562	977	1349	1009	1577*	841	796
Grass grubs per m²	9	32	0	42	12	72	7	77
Clover root weevil adult per m²	208	236	0	0	0	2	0	2
Clover root weevil larvae per m²	-	-	155	205	315	328	71	254
Porina per m²	12	4	2	0	0	4	11	4

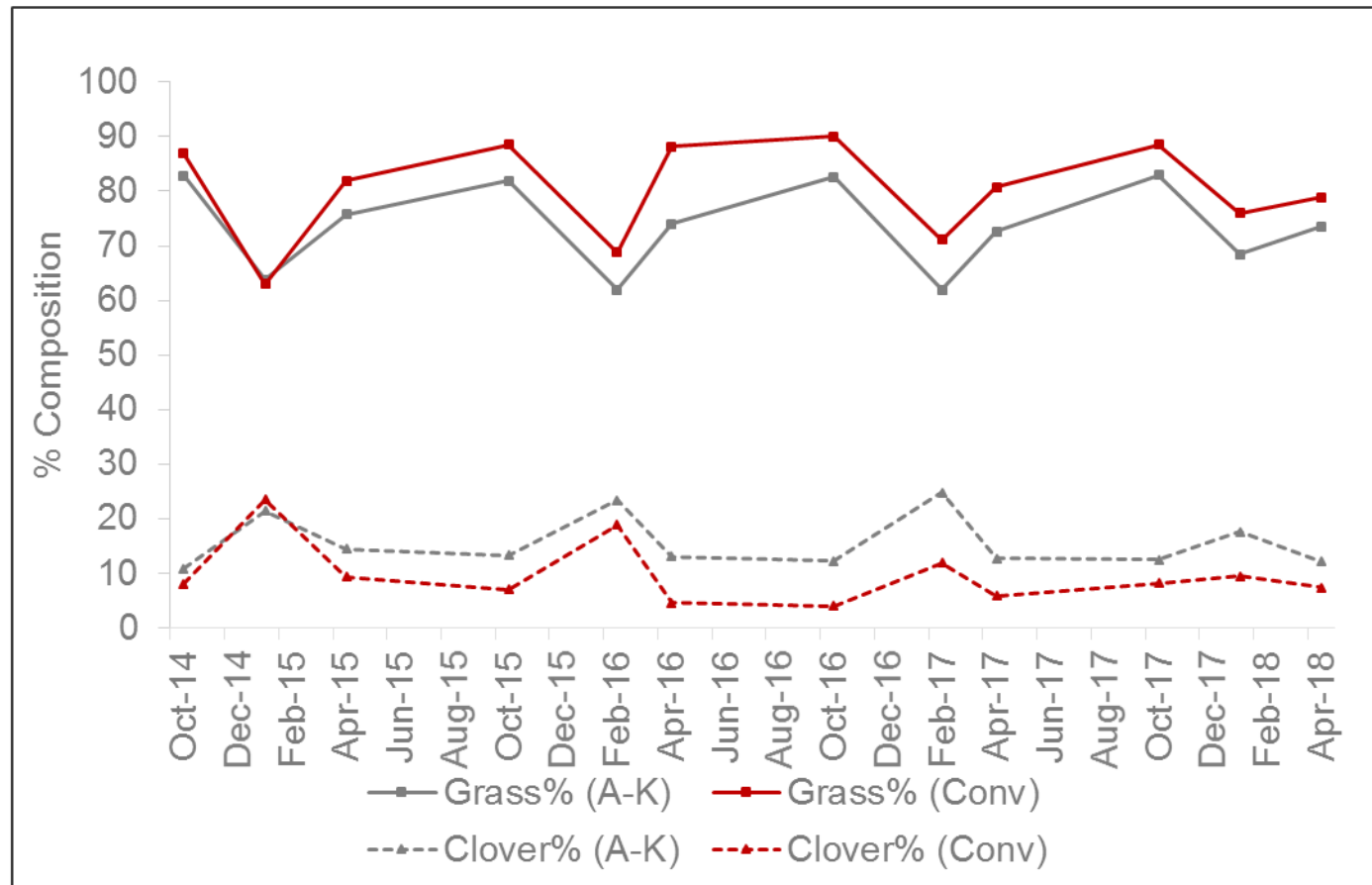
Pasture composition



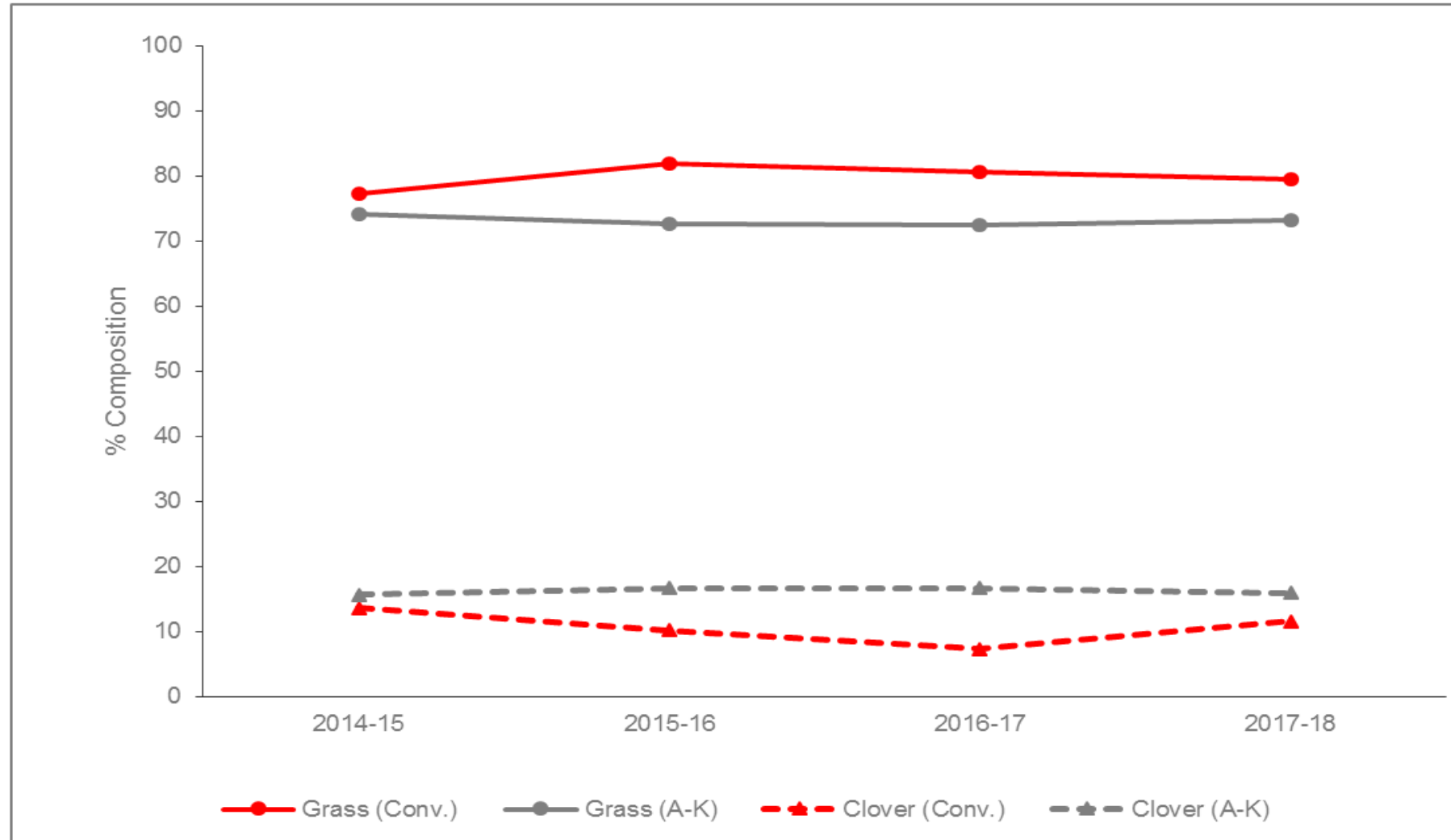
- Seasonal sampling: spring, summer, autumn in each focus pdk
- Sample pre grazing, close to grazing
- Sample paddock in “W” shape, exclude atypical areas
- Clip to as close to ground level, approx. every 20 m (40+ clips)
- Mix and subsample
- Dissection
 - Grass
 - Clover
 - Weed
 - Dead
 - Plus other desirable species
 - Chicory
 - Plantain



Changes to pasture composition (seasonal)



Changes to pasture composition (mean spring, summer autumn)



Conclusions



- Over time differences in farm management may result in changes to pasture composition and soil quality.
- There will be seasonal fluxes of soil structural condition in the focus paddocks, with the primary drivers for this being organic matter returns and moisture content at time of grazing.
- Overall the two systems are mostly consistent, especially in terms of physical soil parameters. Monitoring changes in soil quality in response to management may take longer to detect.
- Differences in earthworms (although inherently variable), readily available sulphur and soil magnesium trends are emerging (all higher on the A-K system).
- One of the focus paddocks under A-K management continues to have high clover content compared to (mostly) the other focus paddocks (where there was no detectable difference in clover proportion).
- Pasture composition response to management
- A-K (where fertiliser N is less) Grass 7% down, clover 7% up (mean 2017/18)

The New Zealand Institute for Plant & Food Research Limited

Plant & Food
RESEARCH

RANGAHAU AHUMĀRA KAI



Thank you!

www.plantandfood.com

Soil Nutrient Demonstration 2017/18 Season Results

Compare Physical Summary

Jun 17 - May 18

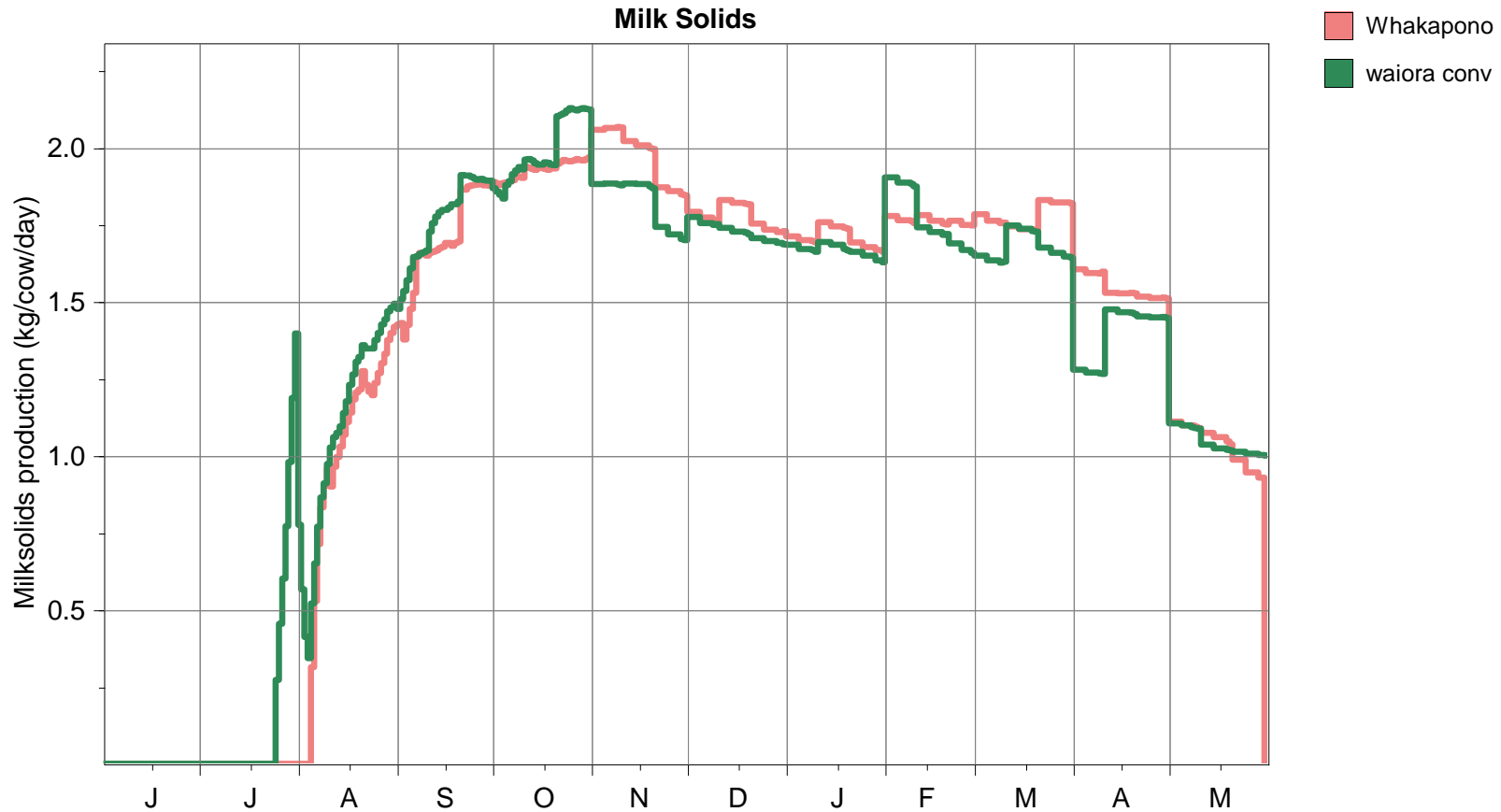
ADVICE TO GROW THE RURAL SECTOR

Category	Description	Whakapono	waiora conv	Units	
		Monitoring	Monitoring		
Farm	Effective Area	155	210	55	ha
	Stocking Rate	3.4	3.3	-0.1	cows/ha
	Potential Pasture Growth	16.5	15.8	-0.7	t DM/ha
	Nitrogen Use	117	106	-12	kg N/ha
	Feed Conversion Efficiency (eaten)	11.1	11.3	0.2	kg DM eaten/kg MS
Herd	Cow Numbers (1st July)	523	697	174	cows
	Peak Cows Milked	523	690	167	cows
	Days in Milk	272	265	-6	days
	Avg. BCS at calving	4.9	4.9	0.0	BCS
	Liveweight	1,526	1,470	-56	kg/ha
Production	Milk Solids total	236,584	303,958	67,373	kg
(to Factory)	Milk Solids per ha	1,526	1,447	-79	kg/ha
	Milk Solids per cow	452	441	-12	kg/cow
	Peak Milk Solids production	2.06	2.12	0.06	kg/cow/day
	Milk Solids as % of live weight	100.1	98.5	-1.6	%
Feeding	Pasture Eaten per cow *	3.8	3.8	0.0	t DM/cow
	Supplements Eaten per cow *	0.6	0.6	0.0	t DM/cow
	Off-farm Grazing Eaten per cow *	0.6	0.6	0.0	t DM/cow
	Total Feed Eaten per cow *	5.0	5.0	0.0	t DM/cow
Diagnostics	Pasture Eaten per ha	12.8	12.6	-0.3	t DM/ha
	Supplements Eaten per ha	2.4	2.3	-0.2	t DM/ha
	Off-farm Grazing Eaten per ha	3.9	3.6	-0.2	t DM/ha
	Total Feed Eaten per ha	19.1	18.5	-0.7	t DM/ha
	Supplements and Grazing / Feed Eaten *	24.6	24.2	-0.4	%
	Bought Feed / Feed Eaten *	12.5	14.9	2.4	%

(*) feed eaten by females > 20 months old / peak cows milked

Compare Milk Solids

Jun 17 - May 18



Supplement Usage Summary for Whakapono

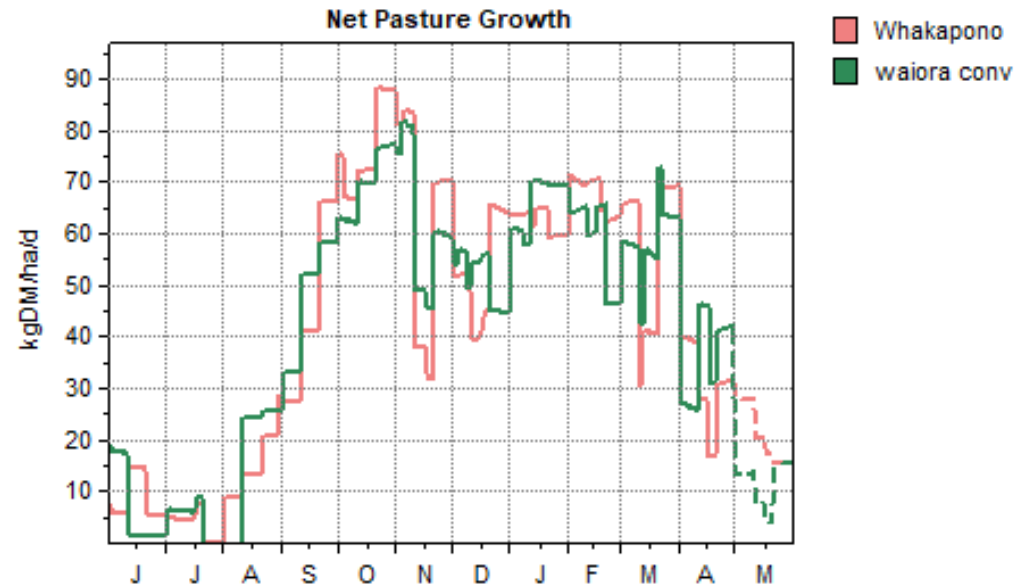
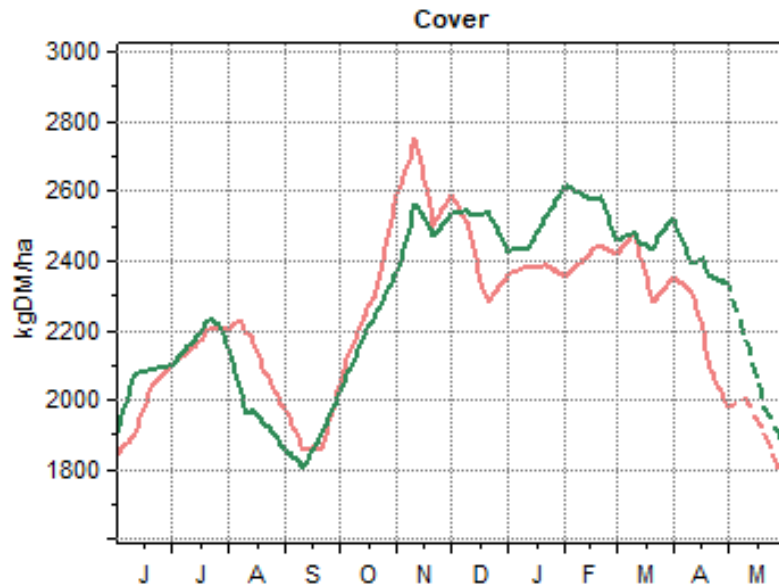
Jun 17 - May 18

Feed	tonnes DM offered												kg	
	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Total	/milker
F1 Meal and Grains bought			2	8	6	8	8	6	6	11	13	1	71	136
F5 Palm Kernel			3	10	6	8	10	6	6	13	13	14	89	170
F2 Pasture Silage bought			34	37	4							86	160	306
F2 Pasture Silage											60		60	114
Total													380	727

Supplement Usage Summary for waiora conv

Jun 17 - May 18

Feed	tonnes DM offered												kg	
	Jun 17	Jul 17	Aug 17	Sep 17	Oct 17	Nov 17	Dec 17	Jan 18	Feb 18	Mar 18	Apr 18	May 18	Total	/milker
F1 Meal and Grains bought			1	9	8	10	13	8	8	17	10	3	89	128
F5 Palm Kernel			5	8	9	10	13	8	8	17	10	18	107	155
F2 Pasture Silage bought		13	43	59	10						66	108	299	433
F2 Pasture Silage											27		27	38
Total													521	755



- 26 Silage HA Made KA (16 %)
- 16 Silage HA made Conv. (8%)

Cost Of Nutrients		year 1	year 2	year 3	year 4	year 5	year 6	TOTAL	average
		2012/13	2013/14	2014/15	2015/16	2016/17	2017/18		last 3 yrs
Whakapono	Biological	178,424	235,957	151,966	114,614	93,310	101,539	875,810	
Waiora	Conventional	169,232	168,781	132,075	139,632	85,738	95,549	791,007	
Per Hectare									
Whakapono	Biological	1,151	1,522	980	739	602	655	5,650	666
Waiora	Conventional	806	804	629	665	408	455	3,767	509

Compare Gross Margin

Jun 17 - May 18

ADVICE TO **GROW** THE RURAL SECTOR



			Whakapono	waiora conv	
			Monitoring	Monitoring	Difference
Revenue	Stock	Sales - Purchases	54,533	79,384	24,852
		Milk (Standard)	1,364,146	1,752,619	388,473
		Total Stock	1,418,679	1,832,004	413,325
	Crop & Feed	Capital Value Change	832	818	-14
		Total Feed	832	818	-14
	Total Revenue		1,419,510	1,832,821	413,311
Expenses	Crop & Feed	Conservation	7,488	3,456	-4,032
		Purchased Feeds	107,396	165,488	58,091
		Calf Feed	3,171	4,257	1,086
		Nitrogen	29,094	35,520	6,426
		Off-Farm Grazing	230,075	303,181	73,106
		Total Crop & Feed	377,224	511,902	134,678
	Stock Costs	Animal Health	52,300	68,400	16,100
		Breeding	20,920	27,360	6,440
		Farm Dairy	12,029	15,732	3,703
		Electricity	18,828	24,624	5,796
		Total Stock Costs	104,077	136,116	32,039
	Total Variable Expenses		481,301	648,018	166,717
Gross Margin			938,210	1,184,804	246,594
Gross Margin per ha			6,053	5,642	-411

2017/18 Gross Margin	Whakapono	Waiora
	KA	Conventional
Gross Margin	6,053	5,642
Cost of Nutrient	655	455
Empty Rate (1.25%)		50
Metabolics (+1.8%)		6
Net Gross Margin	5,398	5,131
	267	



		Whakapono KA				Waiora Conv			
	Season	2015/16	2016/17	Rev 2017/18		2015/16	2016/17	Rev 2017/18	Units
	Effective Area	155	155	155		210	210	210	ha
	Stocking Rate	3.3	3.1	3.4		3.29	3.03	3.3	cows/ha
	Nitrogen Use	117	84	113		160	124	132	kg N/ha
	Peak Cows Milked	506	483	523		690	636	690	cows/ha
Production									
	Milk Solids total (To Fonterra)	254,672	231,745	236,584		340,295	297,258	303,958	kgMS
	Milk Solids per ha	1,643	1,495	1,526		1,620	1,416	1,447	kg/ha
	Milk Solids per cow	503	480	452		493	467	441	kg/cow
Feeding									
	Pasture Eaten per cow	4166	4076	3793		4048	4094	3835	kgDM per Cow
	Supplements Eaten per cow	764	715	727		683	581	755	kgDM/cow
	Total Feed Eaten per cow	4930	4791	4520		4731	4675	4590	t DM/cow
	Pasture Eaten per ha	13.6	12.7	12.8		13.3	12.4	12.6	t DM/ha
	Feed Conv. Efficiency (on platform)	9.8	10.0	10.0		9.6	10.0	10.4	kgDM per KgMS
	Silage Harvested per Ha	173	353	372			676	137	kgDM/Ha
	Total Feed Utilised per Ha	13.8	13.1	13.2		13.3	13.1	12.7	



	Comparison - Average		
Season	Whakapono KA	Waiora Conv	Units
Effective Area	155	210	ha
Stocking Rate	3.27	3.20	cows/ha
Nitrogen Use	105	139	kg N/ha
Peak Cows Milked	504	672	
Milk Solids total (To Fonterra)	241,000	313,837	kgMS
Milk Solids per ha	1555	1494	kg/ha
Milk Solids per cow	478	467	kg/cow
			kgDM per
Pasture Eaten per cow	4012	3992	Cow
Supplements Eaten per cow	735	673	kgDM/cow
Total Feed Eaten per cow	4747	4665	t DM/cow
Pasture Eaten per ha	13.0	12.8	t DM/ha
			kgDM per
Feed Conv. Efficiency (on platform)	9.9	10.0	KgMS
Silage Harvested per Ha	299	407	kgDM/Ha
Total Feed Utilised per Ha	13.3	13.0	

