

Top Orchard Flat

Soil type: Volcanic silt over shingle

Area: 3.5 Ha

History

Sultan autumn 2015

Hay spring 2015

Ripped autumn 2016

Disced autumn 2016

Lucerne autumn 2016

Hay spring 2016

02/04/18	Sprayed	3.5L/Ha Dockstar
10/08/18	Sprayed	2.5L/Ha Glyphosate 360
04/10/18	Seed	Chicory/Plantain/Strawberry clover (14kg/Ha)
08/05/19	Sprayed	3L/Ha Haloxypop
30/03/20	Seed	15kg/Ha VNS Italian Ryegrass 30kg/Ha ryecorn 2.8kg/Ha Wesco BAP Annual clovers 1.4kg/Ha Daikon Radish 5kg/Ha Hairy Vetch 1kg/Ha Phacelia 1kg/Ha Borage
16/04/21	Sprayed	3L/Ha Agrisea Soil + 5L/Ha Agrisea Pasture 3L/Ha EM Fulvic
22/04/21	Seed	15kg/Ha Black Oats 0.25kg/Ha Forage rape 3kg/Ha Crimson Clover 2kg/Ha Red Clover blend 3kg/Ha White Clover blend 4kg/Ha Berseem Clover 1kg/Ha Lotus 3kg/Ha Tall Fescue 2kg/Ha Cocksfoot 1kg/Ha Teff 2kg/Ha Chicory 1kg/Ha Daikon Radish 0.5kg/Ha Phacelia 2kg/Ha Brome grass 10kg/Ha Common Vetch Total 51.75kg/Ha
23/04/21	Pesticide	10kg/Ha Dawn slug bait

Right Hand Side

Soil type: Clay yellow + pipe, sand at the bottom

Area: 4.3 Ha

History - Ripped Nov 2018?

29/09/19 Sprayed 6L/Ha Glyphosate
5L/Ha Agrisea Soil +
100ml/100L Organosilicone

Oct 19 Fert 887kg/Ha Agricultural Lime
313kg/Ha Sulphate of Ammonia
250kg/Ha Muriate of Potash
20kg/Ha Organibor (10% B)
10kg/Ha Manganese Sulphate (31.8% Mn)
20kg/Ha EM Solid

Discussion point on Muriate of Potash method of delivery once applied. Detrimental to biology.

03/11/19 Seed Maize green feed (37kg/Ha)

Fert 142kg/Ha DAP drilled with seed

05/11/19 Sprayed 3L/Ha Cutter
3L/Ha Atrflow

Pre emergence spray didn't work so would not do again.

Got hit with Army worm close to harvesting, not sprayed upon observation of parasitic wasp.

Feb 20 Harvested 30T/Ha Maize into pit silage

31/03/20 Sprayed 5L/Ha Glyphosate
5L/Ha Agrisea Soil +
100ml/100L Organosilicone

07/04/20 Seed Marks Mix (agrisea coated seed) (30kg/Ha)
7kg/Ha Saxon Ryegrass
3kg/Ha Prerun Festulolium
3kg/Ha Tri blend white clovers
1kg/Ha Persian clover
2kg/Ha Tri blend red clovers
1.5kg/Ha Crown vision cocksfoot
1.5kg/Ha Vision cocksfoot
2kg/Ha Timothy
1kg/Ha Hercules Plantain
1kg/Ha Sargent chicory
2kg/Ha Hillary Fescue
2kg/Ha Matua Brome
1kg/Ha Phalaris
1kg/Ha Wesco Herbal Ley (tansy, parsley, sorrel, salad burnett)
1kg/Ha lucerne

ANALYTICAL REPORT

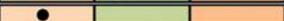
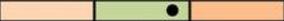
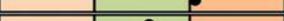
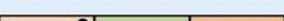
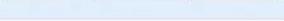
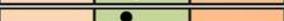
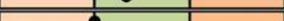
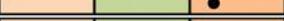
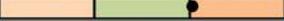
REPORT CODE AR-19-NU-072626-01 Fred & Tracey Ody C/- Avoca Whangarei	REPORT DATE 13/09/2019 Avoca Terry Nicolle PO Box 1053 WHANGAREI 0140 NEW ZEALAND +64 21 286 2201 terry@avocagroup.co.nz
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Contact for your orders: Sarah Jones **Order code:** EUNZAU-00206268

Sample Name	Right Hand Side
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Sample Code: 816-2019-00231817	Soil Type Volcanic
Sampling Date: 05/09/2019	Land Use General Crop
Reception Date: 09/09/2019	Depth (mm) 100
Analysis ending date: 13/09/2019	Property Name Ody Brothers

SOIL TEST RESULTS	Units	Results	Soil Range	Soil Fertility Desired
NU015 pH	pH units	6.1	6~6.5	
NU028 Anion Storage Capacity	%	17	40~80	
◆ NUD09 Effective Cation Exchange Capacity	cmol+/kg	28	12~25	
◆ NUD17 Exchangeable Hydrogen Saturation	%	13	10~15	
◆ NU388 Volume Weight	g/ml	0.69		
ANIONS				
NU252 Olsen Phosphorus	mg/l	27	15~30	
◆ NU049 Bray 2 Phosphorus	mg/l	95	65~160	
◆ NU363 Total Recoverable Phosphorus	mg/kg	889	800~900	
NU342 Sulfate Sulfur	mg/kg	16	7~12	
NU369 Total Recoverable Sulfur	mg/kg	815	600~1000	
CATIONS				
NU057 Calcium MAF QT	MAF QT	17	10~15	
◆ NUD04 Exchangeable Calcium	cmol+/kg	19.2		
NU189 Magnesium MAF QT	MAF QT	45	16~24	
◆ NUD05 Exchangeable Magnesium	cmol+/kg	2.87		
NU280 Potassium MAF QT	MAF QT	7	8~12	
◆ NUD06 Exchangeable Potassium	cmol+/kg	0.56		
NU326 Sodium MAF QT	MAF QT	7	1~10	
◆ NUD07 Exchangeable Sodium	cmol+/kg	0.18		
BASE SATURATION				
◆ NUD10 Total Base Saturation	%	87		
◆ NU051 Calcium Base Saturation	%	68	60~80	
◆ NU217 Magnesium Base Saturation	%	10	8~15	
◆ NU171 Potassium Base Saturation	%	2.0	2~5	
◆ NU234 Sodium Base Saturation	%	0.6	1~2	
◆ NUE79 Other Bases	%	5.3		
TRACE ELEMENTS				
◆ NU047 Hot Water Boron	mg/kg	0.9	1~2	
◆ NU098 EDTA Cobalt	mg/kg	0.8	0.5~4	
◆ NU109 EDTA Copper	mg/kg	4.8	0.3~10	
◆ NU169 EDTA Iron	mg/kg	1800	100~1000	
◆ NU197 EDTA Manganese	mg/kg	108	5~100	
◆ NU396 EDTA Zinc	mg/kg	6.6	3~20	

REPORT INFORMATION

Desirable cropping and horticulture ranges are provided for guideline only; values are based on research & reference values where available, values may not reflect local soils, climate, or terrain.

Anion Storage Capacity is an inherent property of the soil, a plot is only provided to indicate if the soil is classified as low, medium, or high; rather than indicating an actual desired value. Typical values for different soil types: Volcanic soils >80%, pumice 50-70%, sedimentary 30-50%, most peats, podzols and fine textured soils are usually less than 20%. To reduce possible leaching losses of P and S fertilisers, it is advisable to apply slow release P and S fertilisers when the soil ASC < 40% on mineral soils and for peat soils when ASC < 60%.

Sample Name 2019 Maize Diverse

Sample Code:	816-2020-00232566	Soil Type	Sedimentary
Sampling Date:	09/09/2020	Land Use	Maize
Reception Date:	11/09/2020	Depth (mm)	100
Analysis Ending Date:	17/09/2020		

SOIL TEST RESULTS	Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015 pH	pH units	5.9	6~6.5	
NU028 Anion Storage Capacity	%	17	40~80	
◆NUD09 Effective Cation Exchange Capacity	cmol+/kg	27	12~25	
◆NUD17 Exchangeable Hydrogen Saturation	%	18	10~15	
◆NU388 Volume Weight	g/ml	0.79		
ANIONS				
NU252 Olsen Phosphorus	mg/l	36	15~30	
◆NU049 Bray 2 Phosphorus	mg/l	114	45~115	
◆NU363 Total Recoverable Phosphorus	mg/kg	872	800~900	
NU342 Sulfate Sulfur	mg/kg	16	7~12	
NU369 Total Recoverable Sulfur	mg/kg	678	600~1000	
CATIONS				
NU057 Calcium MAF QT	MAF QT	18	5~10	
◆NUD04 Exchangeable Calcium	cmol+/kg	17.5		
NU189 Magnesium MAF QT	MAF QT	42	10~16	
◆NUD05 Exchangeable Magnesium	cmol+/kg	2.35		
NU280 Potassium MAF QT	MAF QT	6	8~10	
◆NUD06 Exchangeable Potassium	cmol+/kg	0.40		
NU326 Sodium MAF QT	MAF QT	7	1~10	
◆NUD07 Exchangeable Sodium	cmol+/kg	0.17		
BASE SATURATION				
◆NUD10 Total Base Saturation	%	82		
◆NU051 Calcium Base Saturation	%	65	60~80	
◆NU217 Magnesium Base Saturation	%	8.8	8~15	
◆NU171 Potassium Base Saturation	%	1.5	2~5	
◆NU234 Sodium Base Saturation	%	0.6	1~2	
◆NUE79 Other Bases	%	5.6		
TRACE ELEMENTS				
◆NU047 Hot Water Boron	mg/kg	1.3	1~2	
◆NU098 EDTA Cobalt	mg/kg	0.8	0.5~4	
◆NU109 EDTA Copper	mg/kg	4.1	0.3~10	
◆NU169 EDTA Iron	mg/kg	1350	100~1000	
◆NU197 EDTA Manganese	mg/kg	102	5~100	
◆NU396 EDTA Zinc	mg/kg	5.3	3~20	

ANALYTICAL REPORT

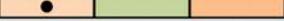
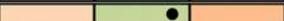
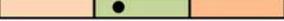
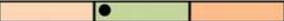
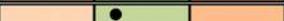
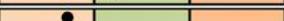
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Ody Brothers C/- Avoca Whangarei		Avoca Terry Nicolle PO Box 1053 WHANGAREI 0140 NEW ZEALAND +64 21 286 2201 terry@avocagroup.co.nz	



Contact for your orders: Sarah Jones **Order code:** EUNZAU-00321284

Sample Name	Right Hand Side Diverse Grass
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Sample Code:	816-2020-00296407	Plant Type	Pasture Spring
Sampling Date:	11/11/2020		
Reception Date:	13/11/2020		
Analysis Ending Date:	19/11/2020		

FEED QUALITY	Units	Results	Plant Range	Plant Nutrition Desired
◆ NUD90 Crude Ash	g/kg dm	88	70~110	
DIGESTIBILITY / ENERGY				
◆ NUE50 Metabolisable Energy (ME)	MJ/kg dm	10.8	11~12.5	
◆ NUD76 Digestibility (DOMD, gOM/kg DM)	g/kg dm	675	705~801	
MACRO ELEMENTS				
NU251 Nitrogen	%	2.1	4.5~5.5	
NU268 Phosphorus	%	0.32	0.35~0.4	
NU279 Potassium	%	2.9	2.5~3	
NU341 Sulfur	%	0.33	0.28~0.4	
NU056 Calcium	%	0.37	0.25~0.5	
NU187 Magnesium	%	0.18	0.16~0.22	
NU324 Sodium	%	0.09		
TRACE ELEMENTS				
NU196 Manganese	mg/kg	69	25~30	
NU108 Copper	mg/kg	6.2	6~7	
NU046 Boron	mg/kg	6.4	6~15	
NU394 Zinc	mg/kg	25	20~50	
NU168 Iron	mg/kg	35	50~60	
◆ NU097 Cobalt	mg/kg	0.08		
◆ NU232 Molybdenum	mg/kg	0.70		
◆ NU294 Selenium	mg/kg	0.03		
◆ NU350 Titanium	mg/kg	<10		

Sample Name Right Hand Side Diverse Clover/Chicory

Sample Code:	816-2020-00296408	Plant Type	Pasture Spring
Sampling Date:	11/11/2020		
Reception Date:	13/11/2020		
Analysis Ending Date:	19/11/2020		

FEED QUALITY	Units	Results	Plant Range	Plant Nutrition Desired
◆ NUD90 Crude Ash	g/kg dm	100	70~110	
DIGESTIBILITY / ENERGY				
◆ NUE50 Metabolisable Energy (ME)	MJ/kg dm	10.9	11~12.5	
◆ NUD76 Digestibility (DOMD, gOM/kg DM)	g/kg dm	684	705~801	
MACRO ELEMENTS				
NU251 Nitrogen	%	2.5	4.5~5.5	
NU268 Phosphorus	%	0.39	0.35~0.4	
NU279 Potassium	%	3.1	2.5~3	
NU341 Sulfur	%	0.33	0.28~0.4	
NU056 Calcium	%	0.73	0.25~0.5	
NU187 Magnesium	%	0.20	0.16~0.22	
NU324 Sodium	%	0.11		
TRACE ELEMENTS				
NU196 Manganese	mg/kg	51	25~30	
NU108 Copper	mg/kg	7.4	6~7	
NU046 Boron	mg/kg	7.5	6~15	
NU394 Zinc	mg/kg	32	20~50	
NU168 Iron	mg/kg	47	50~60	
◆ NU097 Cobalt	mg/kg	0.29		
◆ NU232 Molybdenum	mg/kg	1.3		
◆ NU294 Selenium	mg/kg	0.03		
◆ NU350 Titanium	mg/kg	<10		

REPORT INFORMATION

The Nitrogen Normal Range applies only to pastures sampled in an active stage of growth i.e. Spring and Autumn.

For high production dairy pasture the normal range for potassium should be modified to 3.00 ~ 3.50%.

Typically starch is at very low levels in pasture and pasture silage; below the 1% detection limit of a starch enzymatic test.

SAMPLE COMMENTS
816-2020-00296407 Right Hand Side Diverse Grass

Low Sodium : Levels <0.1% could affect animal health and milk production levels.

Soil contamination : Titanium levels of < 10 ppm indicate little to no soil contamination.

816-2020-00296408 Right Hand Side Diverse Clover/Chicory

Molybdenum levels greater than 1 ppm could induce copper deficiency.

Soil contamination : Titanium levels of < 10 ppm indicate little to no soil contamination.

LIST OF METHODS

NU046 Boron: Microwave digestion, ICP_OES determination	NU056 Calcium: Microwave digestion, ICP_OES determination
NU097 Cobalt: Microwave digestion, ICP_MS determination	NU108 Copper: Microwave digestion, ICP_OES determination
NU168 Iron: Microwave digestion, ICP_OES determination	NU187 Magnesium: Microwave digestion, ICP_OES determination
NU196 Manganese: Microwave digestion, ICP_OES determination	NU232 Molybdenum: Microwave digestion, ICP_MS determination
NU251 Nitrogen: Combustion elemental analyser: Thermal conductivity detection.	NU268 Phosphorus: Microwave digestion, ICP_OES determination
NU279 Potassium: Microwave digestion, ICP_OES determination	NU294 Selenium: Microwave digestion, ICP_MS determination
NU324 Sodium: Microwave digestion, ICP_OES determination	NU341 Sulfur: Microwave digestion, ICP_OES determination
NU350 Titanium: Microwave digestion, ICP_OES determination	NU394 Zinc: Microwave digestion, ICP_OES determination

Sample Name	Right Hand Side		
Analysis Start Date & Time:	15/09/2021 15:22	Analysis Ending Date:	18/09/2021
Depth (mm)	150	Soil Type	Sedimentary
Sample Code:	816-2021-00249899	Land Use	Sheep and Beef Pastoral
Sampling Date:	10/09/2021		
Reception Date:	14/09/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	6.3	5.8~6	
NU028	Anion Storage Capacity	%	<10	40~80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	25	12~25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	11	10~15	
◆ NU355	Total Carbon	%	5.5	4~10	
◆ NU259	Organic Matter	%	9.5	7~17	
◆ NU388	Volume Weight	g/ml	0.79		
ANIONS					
NU252	Olsen Phosphorus	mg/l	30	15~20	
◆ NU049	Bray 2 Phosphorus	mg/l	133	50~120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	719	800~900	
NU342	Sulfate Sulfur	mg/kg	6	6~8	
NU369	Total Recoverable Sulfur	mg/kg	2240	600~1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	18	4~10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	18.0		
NU189	Magnesium MAF QT	MAF QT	42	8~10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	2.34		
NU280	Potassium MAF QT	MAF QT	10	4~8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	0.66		
NU326	Sodium MAF QT	MAF QT	9	5~20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	0.21		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	89		
◆ NU051	Calcium Base Saturation	%	71	60~75	
◆ NU217	Magnesium Base Saturation	%	9.3	6~15	
◆ NU171	Potassium Base Saturation	%	2.6	2~5	
◆ NU234	Sodium Base Saturation	%	0.9	1~2	
◆ NUE79	Other Bases	%	5.1		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	1.3	1~2	
◆ NU098	EDTA Cobalt	mg/kg	0.6	0.5~4	
◆ NU109	EDTA Copper	mg/kg	3.7	4~8	
◆ NU169	EDTA Iron	mg/kg	1150	100~1000	
◆ NU197	EDTA Manganese	mg/kg	139	5~100	
◆ NU396	EDTA Zinc	mg/kg	7.9	3~20	

Middle

Soil type: Clay yellow and pipe
Area: 3.2 Ha

History

Drain Autumn 2018

Mole ploughed Autumn 2018

Ripped Autumn 2018

All this because the paddock was extremely wet.

28/09/18	Sprayed	4L/Ha Glyphosate 100ml/100L Organosilicone
08/10/18	Seed	Chicory/Plantain/white clover (13kg/Ha)
	Fert	125kg/Ha DAP drilled with seed
09/05/19	Seed	Agrisea Mix ex Wesco (Agrisea coated seed) 20kg/Ha

Mix came up slowly, planted late in the season, very very dry. No rain for months. Went okay spring and into February when it got too dry again. Ended up overgrazing in desperation and diversity was not seen until spring 2020, red clover and chicory came up. Managed lightly grazed over the summer to encourage what was there to get going again. Quite a lot of kikuyu is back in this paddock, mostly from lack of competition. All seed planted struggled to grow on the dry ridge, so kikuyu had lots of opportunity in that part and has spread from there.

16/12/19	Sprayed	5L/Ha Agrisea Pasture
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Gumtree

Soil type: Clay, peat, shelly sand at bottom.

Area: 3.6 Ha

History

Ripped 2018

Paddock used to grow well and we cut hay off it, then stopped growing spring 2017 after a really wet winter.

28/09/19	Sprayed	6L/Ha Glyphosate 5L/Ha Agrisea Soil + 100ml/100L Organosilicone
Oct 19	Fert	887kg/Ha Agricultural Lime 313kg/Ha Sulphate of Ammonia 250kg/Ha Muriate of Potash 20kg/Ha Organibor (10% B) 10kg/Ha Manganese Sulphate (31.8% Mn) 20kg/Ha EM Solid
02/11/19	Seed	Maize green feed (37kg/Ha) & Sunflowers (17kg/Ha)
	Fert	142kg/Ha DAP drilled with seed
04/11/19	Sprayed	3L/Ha Cutter 3L/Ha Atrflow

Pre emergence spray didn't work so would not do again.

Almost no Army Worm in this paddock as opposed to the straight Maize paddock. Lots and lots of bugs of all different types, lots of bees in the sunflowers, bumblebees love sunflowers.

Feb 20	Harvested	20T/Ha maize and sunflowers, into pit silage
26/03/20	Seed	Asset Rye, Balansa clover, Relish red, & Mainstay white clover, & plantain (27.5kg/Ha)

Not sprayed out Autumn when planted with Asset mix.

We thought this would be a short term crop, being an Italian Ryegrass. We specifically planted it for hay and with a plan to monitor and stitch in more seed if necessary autumn 2021. Didn't do that. Spring 2021 and there is plenty of ryegrass still there and plenty of Balansa. The red clover went well last summer.

Cut over 700 bales of hay off it December 2020.

Shut up for hay again currently.



Certificate of Analysis

Page 1 of 4

Client:	Farmlands - Whangarei	Lab No:	2224044	shvpv1
Address:	10 Southend Avenue Raumanga Whangarei 0110	Date Received:	14-Aug-2019	
		Date Reported:	16-Aug-2019	
		Quote No:		
		Order No:	D1029018455	
		Client Reference:	910461417	
Phone:	09 438 8824	Add. Client Ref:	ODY	
		Submitted By:	Tim Harris	

Sample Name: Maize Prep **Lab Number:** 2224044.1
Sample Type: SOIL Maize (150mm) (S6)

Analysis	Level Found	Medium Range	Low	Medium	High	
pH	pH Units	6.0	5.6 - 6.2			
Olsen Phosphorus	mg/L	23	15 - 30			
Potassium	me/100g	0.51	0.40 - 0.60			
Calcium	me/100g	17.5	5.0 - 12.0			
Magnesium	me/100g	3.63	0.60 - 1.20			
Sodium	me/100g	0.21	0.00 - 0.50			
CEC	me/100g	29	12 - 25			
Total Base Saturation	%	75	50 - 85			
Volume Weight	g/mL	0.85	0.60 - 1.00			
Sulphate Sulphur	mg/kg	14	10 - 15			
Potentially Available Nitrogen (15cm Depth)*	kg/ha	205	100 - 150			
Anaerobically Mineralisable N*	µg/g	161				
Soil Sample Depth*	mm	0-150				
Base Saturation %		K 1.8 Ca 60 Mg 12.5 Na 0.7				
MAF Units		K 9 Ca 19 Mg 70 Na 8				

The above nutrient graph compares the levels found with reference interpretation levels. NOTE: It is important that the correct sample type be assigned, and that the recommended sampling procedure has been followed. R J Hill Laboratories Limited does not accept any responsibility for the resulting use of this information. IANZ Accreditation does not apply to comments and interpretations, i.e. the 'Range Levels' and subsequent graphs.

Certificate of Analysis

Page 2 of 4

Client:	Farmlands - Whangarei	Lab No:	2224044	shvpv1
Address:	10 Southend Avenue Raumanga Whangarei 0110	Date Received:	14-Aug-2019	
		Date Reported:	16-Aug-2019	
		Quote No:		
		Order No:	D1029018455	
		Client Reference:	910461417	
Phone:	09 438 8824	Add. Client Ref:	ODY	
		Submitted By:	Tim Harris	

Soil Analysis Results							
Sample Name:	Maize Prep						
Lab Number:	2224044.1						
Sample Type:	SOIL Maize (150mm)						
Sample Type Code:	S6						
pH	pH Units	6.0	-	-	-	-	-
Olsen Phosphorus	mg/L	23	-	-	-	-	-
Potassium	me/100g	0.51	-	-	-	-	-
Potassium	%BS	1.8	-	-	-	-	-
Potassium	MAF units	9	-	-	-	-	-
Calcium	me/100g	17.5	-	-	-	-	-
Calcium	%BS	60	-	-	-	-	-
Calcium	MAF units	19	-	-	-	-	-
Magnesium	me/100g	3.63	-	-	-	-	-
Magnesium	%BS	12.5	-	-	-	-	-
Magnesium	MAF units	70	-	-	-	-	-
Sodium	me/100g	0.21	-	-	-	-	-
Sodium	%BS	0.7	-	-	-	-	-
Sodium	MAF units	8	-	-	-	-	-
CEC	me/100g	29	-	-	-	-	-
Total Base Saturation	%	75	-	-	-	-	-
Volume Weight	g/mL	0.85	-	-	-	-	-
Sulphate Sulphur	mg/kg	14	-	-	-	-	-
Potentially Available Nitrogen (15cm Depth)*	kg/ha	205	-	-	-	-	-
Anaerobically Mineralisable N*	µg/g	161	-	-	-	-	-
Soil Sample Depth*	mm	0-150	-	-	-	-	-

Agri Testing

Sample Name	Gum Tree		
Analysis Start Date & Time:	19/10/2021 13:57	Analysis Ending Date:	23/10/2021
Depth (mm)	100	Soil Type	Sedimentary
Sample Code:	816-2021-00287672	Land Use	Sheep and Beef Pastoral
Sampling Date:	13/10/2021		
Reception Date:	18/10/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	6.1	5.8-6	
NU028	Anion Storage Capacity	%	41	40-80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	35	12-25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	13	10-15	
◆ NU355	Total Carbon	%	7.1	4-10	
◆ NU259	Organic Matter	%	12.2	7-17	
◆ NU388	Volume Weight	g/ml	0.77		
ANIONS					
NU252	Olsen Phosphorus	mg/l	46	15-20	
◆ NU049	Bray 2 Phosphorus	mg/l	72	50-120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	1320	800-900	
NU342	Sulfate Sulfur	mg/kg	6	6-8	
NU369	Total Recoverable Sulfur	mg/kg	753	600-1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	23	4-10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	22.9		
NU189	Magnesium MAF QT	MAF QT	74	8-10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	4.19		
NU280	Potassium MAF QT	MAF QT	14	4-8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	0.96		
NU326	Sodium MAF QT	MAF QT	11	5-20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	0.26		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	87		
◆ NU051	Calcium Base Saturation	%	66	60-75	
◆ NU217	Magnesium Base Saturation	%	12	6-15	
◆ NU171	Potassium Base Saturation	%	2.8	2-5	
◆ NU234	Sodium Base Saturation	%	0.8	1-2	
◆ NUE79	Other Bases	%	5.3		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	1.7	1-2	
◆ NU098	EDTA Cobalt	mg/kg	5.8	0.5-4	
◆ NU109	EDTA Copper	mg/kg	8.1	4-8	
◆ NU169	EDTA Iron	mg/kg	2210	100-1000	
◆ NU197	EDTA Manganese	mg/kg	455	5-100	
◆ NU396	EDTA Zinc	mg/kg	11.2	3-20	

Big Flat

Soil type: Peat over marine sand, clay patches, shingle, sandstone patches.

Area: 4 Ha

History

Used to be good hay paddock and then stopped growing. Too wet. Another drain dug into the sand, very hard. Compacted peat over marine sand, sand holds the water up, doesn't permeate.

Ripped autumn 2020

05/10/20 Sprayed 4L/Ha Glyphosate
5L/Ha Agrisea Soil +
100ml/100L Organosilicone

Disced one week later just once over, to try to get the turf to break up and possibly eliminate the need to rotary hoe. Observed mycorrhizal fungi 10 days after discing. Still had to hoe it. Lots of trash.

03/11/20 Seed 10kg/Ha Maize
5kg/Ha Popcorn
3kg/Ha Sunflowers
5kg/Ha Forage Peas
2kg/Ha Japanese Millet
2kg/Ha Tef
Total 27kg/Ha – Actual rate 25.5kg/Ha

04/11/20 Sprayed 10L/Ha EM Liquid
10L/Ha Humates Liquid
5L/Ha Agrisea Soil +

Maize and popcorn all got taken by ducks and pukekos, because it was dry and was slow getting going?

31/01/21 Harvested 25T/Ha (guess by volume) mix into pit silage

Lots of regrowth from Millet and Tef, grazed once between harvest and spray out, could have grazed earlier at a shorter length.

Discussion on whether to spray out or not wasn't much of a discussion given the amount of Nightshade.

24/03/21 Sprayed 4L/Ha Glyphosate
5L/Ha Agrisea Soil +
3L/Ha EM Fulvic
100ml/100L Organosilicone

25/03/21 Seed 3kg/Ha Avatar
2kg/Ha Rohan
2kg/Ha Annual Rye (Sultan?)
2kg/Ha Barrier Festulolium
2kg/Ha Chicory
3kg/Ha White clover blend (at least 3 different ones)
1kg/Ha Persian clover

2kg/Ha Red clover blend (at least 3 different ones)
3kg/Ha Vision Cocksfoot
3kg/Ha Finesse Tall Fescue
3kg/Ha Brome grass
1kg/Ha Plantain
2kg/Ha Timothy
1kg/Ha Phalaris
5kg/Ha Ryecorn
0.5kg/Ha Phacelia
1kg/Ha Borage
0.5kg/Ha Daikon Radish
0.6kg/Ha Spinach/Chard blend
Total 37.5kg/Ha – Actual 31.5kg/Ha

26/03/21 Pesticide 10kg/Ha Dawn Slug bait

A lot of germination of nightshade and stinking mayweed.

Discussion on what we do about the weeds.

Goats?

Topping?

The phacelia dilemma:

We had a lot of phacelia come up in this paddock. It grew big and we grazed it with sheep, mainly because the paddock is so wet. It is a very low flat, close to sea level and the drains can have water in them year round, as that is the natural water level. We tried grazing it with calves in a part of the paddock that was drier to see if they would eat the phacelia that the sheep had not touched. The calves didn't eat it either, so why?

We got some herbage tests done in October when we did some of the soil tests. We tested the phacelia only and a separate test for the mixed sward in the same paddock. They were eating the mixed sward but not the phacelia. I'll attach the tests so you can see. The major difference was the DCAD (dietary cation-anion difference). The levels of DCAD in the mixed sward were 209. The DCAD level in the phacelia was 756! So way too many cations (metals) and not enough anions.

Note from lab:

High Pasture DCAD: Levels > 500 can lead to metabolic problems. Aim for a DCAD to be below 300 mEq/kgDM and preferably below 200 mEq/kgDM. This can be achieved by adding maize silage and hay with a low potassium (K) content to the diet, plus using anionic salts/products like biochlor, MgCl₂, MgSO₄, and NH₄SO₄. It is recommended you consult an animal nutritionist.

So, discussion centred around the phacelia pulling up metals from the soil. Is it a good thing and the phacelia will either disappear or become palatable when the extra metals in the soil are gone and things are more balanced? Or is this a feature of phacelia and we should leave it out of future mixes? Is this just another expression of my theory that we have too much potassium on our farm?

Sample Name Big Flats

Sample Code:	816-2020-00232568	Soil Type	Sedimentary
Sampling Date:	09/09/2020	Land Use	General Crop
Reception Date:	11/09/2020	Depth (mm)	100
Analysis Ending Date:	17/09/2020		

SOIL TEST RESULTS	Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015 pH	pH units	6.0	6~6.5	
NU028 Anion Storage Capacity	%	35	40~80	
◆ NUD09 Effective Cation Exchange Capacity	cmol+/kg	36	12~25	
◆ NUD17 Exchangeable Hydrogen Saturation	%	16	10~15	
◆ NU388 Volume Weight	g/ml	0.73		
ANIONS				
NU252 Olsen Phosphorus	mg/l	34	15~30	
◆ NU049 Bray 2 Phosphorus	mg/l	47	65~160	
◆ NU363 Total Recoverable Phosphorus	mg/kg	1150	800~900	
NU342 Sulfate Sulfur	mg/kg	18	7~12	
NU369 Total Recoverable Sulfur	mg/kg	910	600~1000	
CATIONS				
NU057 Calcium MAF QT	MAF QT	22	10~15	
◆ NUD04 Exchangeable Calcium	cmol+/kg	23.1		
NU189 Magnesium MAF QT	MAF QT	65	16~24	
◆ NUD05 Exchangeable Magnesium	cmol+/kg	3.88		
NU280 Potassium MAF QT	MAF QT	16	8~12	
◆ NUD06 Exchangeable Potassium	cmol+/kg	1.13		
NU326 Sodium MAF QT	MAF QT	8	1~10	
◆ NUD07 Exchangeable Sodium	cmol+/kg	0.20		
BASE SATURATION				
◆ NUD10 Total Base Saturation	%	84		
◆ NU051 Calcium Base Saturation	%	64	60~80	
◆ NU217 Magnesium Base Saturation	%	11	8~15	
◆ NU171 Potassium Base Saturation	%	3.1	2~5	
◆ NU234 Sodium Base Saturation	%	0.6	1~2	
◆ NUE79 Other Bases	%	5.5		
TRACE ELEMENTS				
◆ NU047 Hot Water Boron	mg/kg	1.2	1~2	
◆ NU098 EDTA Cobalt	mg/kg	5.4	0.5~4	
◆ NU109 EDTA Copper	mg/kg	8.8	0.3~10	
◆ NU169 EDTA Iron	mg/kg	2020	100~1000	
◆ NU197 EDTA Manganese	mg/kg	395	5~100	
◆ NU396 EDTA Zinc	mg/kg	13.1	3~20	

REPORT INFORMATION

Desirable cropping and horticulture ranges are provided for guideline only; values are based on research & reference values where available, values may not reflect local soils, climate, or terrain.

Anion Storage Capacity is an inherent property of the soil, a plot is only provided to indicate if the soil is classified as low, medium, or high; rather than indicating an actual desired value. Typical values for different soil types: Volcanic soils >80%, pumice 50-70%, sedimentary 30-50%, most peats, podzols and fine textured soils are usually less than 20%. To reduce possible leaching losses of P and S fertilisers, it is advisable to apply slow release P and S fertilisers when the soil ASC < 40% on mineral soils and for peat soils when ASC < 60%.

SAMPLE COMMENTS

816-2020-00232567 Bottom Orchard Paddock

pH: For levels of 5.5 or less an Aluminium test is recommended to check for Aluminium toxicity.

Total Sulfur test is not recommended for Peat soils due to poor field calibration. The Sulfate-S & Extractable Organic Sulfur methods are recommended for peat soils.

LIST OF METHODS

NU015 pH: Internal Method, Electrometry

Agri Testing

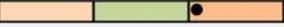
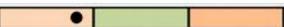
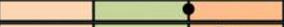
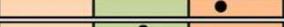
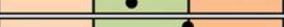
Sample Name	Big Flat		
Analysis Start Date & Time:	19/10/2021 13:57	Analysis Ending Date:	23/10/2021
Depth (mm)	100	Soil Type	Sedimentary
Sample Code:	816-2021-00287673	Land Use	Sheep and Beef Pastoral
Sampling Date:	13/10/2021		
Reception Date:	18/10/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	5.9	5.8-6	
NU028	Anion Storage Capacity	%	30	40-80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	32	12-25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	20	10-15	
◆ NU355	Total Carbon	%	6.8	4-10	
◆ NU259	Organic Matter	%	11.7	7-17	
◆ NU388	Volume Weight	g/ml	0.83		
ANIONS					
NU252	Olsen Phosphorus	mg/l	42	15-20	
◆ NU049	Bray 2 Phosphorus	mg/l	73	50-120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	1010	800-900	
NU342	Sulfate Sulfur	mg/kg	7	6-8	
NU369	Total Recoverable Sulfur	mg/kg	712	600-1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	21	4-10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	19.9		
NU189	Magnesium MAF QT	MAF QT	67	8-10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	3.53		
NU280	Potassium MAF QT	MAF QT	7	4-8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	0.47		
NU326	Sodium MAF QT	MAF QT	15	5-20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	0.33		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	81		
◆ NU051	Calcium Base Saturation	%	61	60-75	
◆ NU217	Magnesium Base Saturation	%	11	6-15	
◆ NU171	Potassium Base Saturation	%	1.4	2-5	
◆ NU234	Sodium Base Saturation	%	1.0	1-2	
◆ NUE79	Other Bases	%	5.7		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	1.3	1-2	
◆ NU098	EDTA Cobalt	mg/kg	4.3	0.5-4	
◆ NU109	EDTA Copper	mg/kg	8.6	4-8	
◆ NU169	EDTA Iron	mg/kg	2390	100-1000	
◆ NU197	EDTA Manganese	mg/kg	263	5-100	
◆ NU396	EDTA Zinc	mg/kg	12.8	3-20	

Agri Testing
ANALYTICAL REPORT

REPORT CODE	AR-21-NU-082572-01	REPORT DATE	20/09/2021
Fred & Tracey Ody C/- Avoca Whangarei		Avoca Briar Philcox PO Box 1053 WHANGAREI 0140 NEW ZEALAND +64 21 883 182 briar@avocagroup.co.nz	

Contact for your orders:	Sarah Jones	Order code:	EUNZAU-00405201
Sample Name		Big Flat	
Analysis Start Date & Time:		Analysis Ending Date:	
16/09/2021 15:04		20/09/2021	
Sample Code:		Plant Type	
816-2021-00249519		Pasture Spring	
Sampling Date:			
10/09/2021			
Reception Date:			
14/09/2021			

FEED QUALITY	Units	Results	Plant Range	Plant Nutrition Desired
◆ NU123 Dry Matter (DM)	g/kg	143	140~180	
◆ NUD88 Crude Protein (CP)	g/kg dm	229	200~380	
◆ NUD90 Crude Ash	g/kg dm	124	70~110	
◆ NUE56 Organic Matter (OM)	g/kg dm	876	880~920	
FIBRE / CARBOHYDRATES				
◆ NUD83 Neutral Detergent Fibre (NDF)	g/kg dm	440	350~420	
DIGESTIBILITY / ENERGY				
◆ NUE50 Metabolisable Energy (ME)	MJ/kg dm	11.8	11~12.5	
◆ NUD76 Digestibility (DOMD, gOM/kg DM)	g/kg dm	736	705~801	
MACRO ELEMENTS				
◆ NUD46 Nitrogen	%	3.7	4.5~5.5	
NU268 Phosphorus	%	0.48	0.35~0.4	
NU279 Potassium	%	3.5	2.5~3	
NU341 Sulfur	%	0.41	0.28~0.4	
NU056 Calcium	%	0.89	0.25~0.5	
NU187 Magnesium	%	0.19	0.16~0.22	
NU324 Sodium	%	0.37		
◆ NUD75 Chloride	%	2.4		
◆ NU117 Dietary Cation-Anion Difference (DCAD)	meq/kg dm	209		
TRACE ELEMENTS				
NU196 Manganese	mg/kg	110	25~30	
NU108 Copper	mg/kg	11	6~7	
NU046 Boron	mg/kg	12	6~15	
NU394 Zinc	mg/kg	31	20~50	
NU168 Iron	mg/kg	78	50~60	
◆ NU097 Cobalt	mg/kg	0.21		
◆ NU232 Molybdenum	mg/kg	0.99		
◆ NU294 Selenium	mg/kg	0.04		
◆ NU350 Titanium	mg/kg	<10		

Sample Name	Big Flat Phacelia		
Analysis Start Date & Time:	16/09/2021 15:04	Analysis Ending Date:	20/09/2021
Sample Code:	816-2021-00249520	Plant Type	Pasture Spring
Sampling Date:	10/09/2021		
Reception Date:	14/09/2021		

FEED QUALITY	Units	Results	Plant Range	Plant Nutrition Desired
◆ NU123 Dry Matter (DM)	g/kg	131	140~180	
◆ NUD88 Crude Protein (CP)	g/kg dm	290	200~380	
◆ NUD90 Crude Ash	g/kg dm	136	70~110	
◆ NUE56 Organic Matter (OM)	g/kg dm	864	880~920	
FIBRE / CARBOHYDRATES				
◆ NUD83 Neutral Detergent Fibre (NDF)	g/kg dm	303	350~420	
DIGESTIBILITY / ENERGY				
◆ NUE50 Metabolisable Energy (ME)	MJ/kg dm	11.8	11~12.5	
◆ NUD76 Digestibility (DOMD, gOM/kg DM)	g/kg dm	734	705~801	
MACRO ELEMENTS				
◆ NUD46 Nitrogen	%	4.6	4.5~5.5	
NU268 Phosphorus	%	0.59	0.35~0.4	
NU279 Potassium	%	3.3	2.5~3	
NU341 Sulfur	%	0.43	0.28~0.4	
NU056 Calcium	%	3.0	0.25~0.5	
NU187 Magnesium	%	0.23	0.16~0.22	
◆ NUD75 Sodium	%	0.17		
◆ NUD75 Chloride	%	1.2		
◆ NU117 Dietary Cation-Anion Difference (DCAD)	meq/kg dm	756		
TRACE ELEMENTS				
NU196 Manganese	mg/kg	29	25~30	
NU108 Copper	mg/kg	11	6~7	
NU046 Boron	mg/kg	29	6~15	
NU394 Zinc	mg/kg	29	20~50	
NU168 Iron	mg/kg	51	50~60	
◆ NU097 Cobalt	mg/kg	0.12		
◆ NU232 Molybdenum	mg/kg	0.85		
◆ NU294 Selenium	mg/kg	0.03		
◆ NU350 Titanium	mg/kg	<10		

REPORT INFORMATION

For high production dairy pasture the normal range for potassium should be modified to 3.00 ~ 3.50%.

Typically starch is at very low levels in pasture and pasture silage; below the 1% detection limit of a starch enzymatic test.

SAMPLE COMMENTS
816-2021-00249519 Big Flat

Soil contamination : Titanium levels of < 10 ppm indicate little to no soil contamination.

High Pasture Neutral Detergent Fibre: a high NDF value which indicates a mature pasture and/or contains a lot of dead material. The goal is to have dietary NDF values no higher than 450 g/kgDM so supplementing the diet with low fibre supplements such as turnips and grains may be beneficial.

816-2021-00249520 Big Flat Phacelia

High Pasture DCAD: Levels > 500 can lead to metabolic problems. Aim for a DCAD to be below 300 mEq/kgDM and preferably below 200 mEq/kgDM. This can be achieved by adding maize silage and hay with a low potassium (K) content to the diet, plus using anionic salts/products like biochlor, MgCl₂, MgSO₄, and NH₄SO₄. It is recommended you consult an animal nutritionist.

Soil contamination : Titanium levels of < 10 ppm indicate little to no soil contamination.

Low Pasture Dry Matter: Short, rapidly growing pastures in the SPRING and AUTUMN can have low DM content, particularly in wet weather conditions, or if sample contains surface water. This may reduce total DM intakes. The Goal is to have a DM content of at least 120 g/kg.

Bottom Orchard Flat

Soil type: Peat over sand, volcanic silt over shingle
Area: 2.8 Ha

History

Hay paddock
Good grower
Ripped autumn 2020

1/11/20	Sprayed	4L/Ha Glyphosate 5L/Ha Agrisea Soil + 10L/Ha EM Liquid 10L/Ha Liquid Humates 100ml/100L Organosilicone
02/11/20	Seed	15kg/Ha Maize 5kg/Ha Pop corn 3kg/Ha Sunflower 5kg/Ha Common Vetch (28kg/Ha total)

Seed came up well, lack of rain was an issue, ducks and pukekos took all the maize from all 3 paddocks that we had planted. Other 2 were more diverse mixes so we left them, this paddock was only left with sunflowers and vetch, decided to reseed. Reseeded through the sunflowers and vetch, sunflowers miraculously stood up again after getting drilled and rolled, we harvested them with the other paddock to silage pit, had a breakdown, left with half a paddock, which we cut and carried to cows and calves and bulls.

08/12/20	Seed	30kg/Ha Barley 25kg/Ha Forage Peas 3kg/Ha Sunflowers 5kg/Ha Common Vetch 2kg/Ha Japanese Millet 8kg/Ha Annual Rye 1kg/Ha Phacelia 10kg/Ha Buckwheat Total 87kg/Ha
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Desperation mix went in late into the dry. Didn't get a chance, no rain. Had some come up, few peas, some barley, sunflowers, millet, buckwheat, phacelia. Impressed with the Phacelia as at harvest it was over a foot tall and flowering, was part of the decision to put Phacelia in the other mixes this Autumn. The Vetch also went well, not sure if it was the original or later seeded, maybe both, was up above the kikuyu, 80-100cm when we harvested, so competed well with kikuyu.

Jan 21	Harvested	Half paddock of sunflowers and vetch (mainly) harvested into pit silage. Was very wet as behind other paddock, due to set back on reseeded. Breakdown of equipment meant only half paddock harvested.
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Mar 21		Rest of paddock cut and carried in March.
13/04/21	Sprayed	4L/Ha Glyphosate 5L/Ha Agrisea Soil + 3L/Ha EM Fulvic 100ml/100L Organosilicone
15/04/21	Seed	40kg/Ha Ryecorn 15kg/Ha Black Oats 15kg/Ha Barley 4kg/Ha Sultan ryegrass 0.25kg/Ha Forage rape 3kg/Ha Crimson Clover 2kg/Ha Red Clover blend 3kg/Ha White Clover blend 4kg/Ha Berseem Clover 1kg/Ha Lotus 3kg/Ha Tall Fescue 2kg/Ha Cocksfoot 1kg/Ha Teff 2kg/Ha Chicory 1kg/Ha Daikon Radish 0.5kg/Ha Phacelia 2kg/Ha Brome grass Total 98kg/Ha
16/04/21	Pesticide	10kg/Ha Dawn slug bait

Lots of germination of nightshade, discussion on what to do about the weeds.

Comment on the crop:

This "Winter Silage Mix" has gone really well. We grazed this paddock twice with weaners and once with sheep. The calves didn't eat the radishes, so we put lambs in there to try to get them to eat the radishes. They had been eating radishes in other paddocks, but the issue is that they like the other stuff more than the brassicas so tend to eat that first and it is a balancing act to get them to eat the brassicas without overgrazing the rest of the plants.

It was shut up around mid September, for a 2 month break to grow for silage.

Options here: Can be baleage, pit silage or grazed off.

Sample Name Bottom Orchard Paddock

Sample Code: 816-2020-00232567
Sampling Date: 09/09/2020
Reception Date: 11/09/2020
Analysis Ending Date: 17/09/2020

Soil Type Peat
Land Use General Crop
Depth (mm) 100

SOIL TEST RESULTS	Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015 pH	pH units	5.5	6~6.5	
NU028 Anion Storage Capacity	%	47	40~80	
◆NUD09 Effective Cation Exchange Capacity	cmol+/kg	42	12~25	
◆NUD17 Exchangeable Hydrogen Saturation	%	31	10~15	
◆NU388 Volume Weight	g/ml	0.64		
ANIONS				
NU252 Olsen Phosphorus	mg/l	25	15~30	
◆NU049 Bray 2 Phosphorus	mg/l	40	65~160	
◆NU363 Total Recoverable Phosphorus	mg/kg	1120	800~900	
NU342 Sulfate Sulfur	mg/kg	20	7~12	
NU369 Total Recoverable Sulfur	mg/kg	835	600~1000	
CATIONS				
NU057 Calcium MAF QT	MAF QT	17	10~15	
◆NUD04 Exchangeable Calcium	cmol+/kg	21.2		
NU189 Magnesium MAF QT	MAF QT	61	16~24	
◆NUD05 Exchangeable Magnesium	cmol+/kg	4.16		
NU280 Potassium MAF QT	MAF QT	11	8~12	
◆NUD06 Exchangeable Potassium	cmol+/kg	0.89		
NU326 Sodium MAF QT	MAF QT	9	1~10	
◆NUD07 Exchangeable Sodium	cmol+/kg	0.26		
BASE SATURATION				
◆NUD10 Total Base Saturation	%	69		
◆NU051 Calcium Base Saturation	%	50	60~80	
◆NU217 Magnesium Base Saturation	%	9.8	8~15	
◆NU171 Potassium Base Saturation	%	2.1	2~5	
◆NU234 Sodium Base Saturation	%	0.6	1~2	
◆NUE79 Other Bases	%	6.5		
TRACE ELEMENTS				
◆NU047 Hot Water Boron	mg/kg	1.3	1~2	
◆NU098 EDTA Cobalt	mg/kg	6.3	1~2	
◆NU109 EDTA Copper	mg/kg	10.5	1~10	
◆NU169 EDTA Iron	mg/kg	2810	100~1000	
◆NU197 EDTA Manganese	mg/kg	380	5~100	
◆NU396 EDTA Zinc	mg/kg	12.3	3~20	

Agri Testing

Sample Name	Bottom Orchard Flat		
Analysis Start Date & Time:	19/10/2021 13:57	Analysis Ending Date:	23/10/2021
Depth (mm)	100	Soil Type	Sedimentary
Sample Code:	816-2021-00287674	Land Use	Sheep and Beef Pastoral
Sampling Date:	13/10/2021		
Reception Date:	18/10/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	5.9	5.8-6	
NU028	Anion Storage Capacity	%	39	40-80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	31	12-25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	19	10-15	
◆ NU355	Total Carbon	%	5.2	4-10	
◆ NU259	Organic Matter	%	8.9	7-17	
◆ NU388	Volume Weight	g/ml	0.81		
ANIONS					
NU252	Olsen Phosphorus	mg/l	43	15-20	
◆ NU049	Bray 2 Phosphorus	mg/l	58	50-120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	1060	800-900	
NU342	Sulfate Sulfur	mg/kg	8	6-8	
NU369	Total Recoverable Sulfur	mg/kg	593	600-1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	19	4-10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	18.6		
NU189	Magnesium MAF QT	MAF QT	72	8-10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	3.87		
NU280	Potassium MAF QT	MAF QT	11	4-8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	0.69		
NU326	Sodium MAF QT	MAF QT	15	5-20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	0.34		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	81		
◆ NU051	Calcium Base Saturation	%	59	60-75	
◆ NU217	Magnesium Base Saturation	%	12	6-15	
◆ NU171	Potassium Base Saturation	%	2.2	2-5	
◆ NU234	Sodium Base Saturation	%	1.1	1-2	
◆ NUE79	Other Bases	%	5.7		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	1.3	1-2	
◆ NU098	EDTA Cobalt	mg/kg	6.9	0.5-4	
◆ NU109	EDTA Copper	mg/kg	8.9	4-8	
◆ NU169	EDTA Iron	mg/kg	2330	100-1000	
◆ NU197	EDTA Manganese	mg/kg	529	5-100	
◆ NU396	EDTA Zinc	mg/kg	11.0	3-20	

Ridge Paddock

Soil type: Clay yellow and pipe

Area: 2.4 Ha

History

Used as a springer paddock, gets very pugged in the spring when it's wet. Not a good grower because of compaction. Unable to be ripped as it has a water pipe through the middle of it.

01/11/20 Sprayed 4L/Ha Glyphosate
5L/Ha Agrisea Soil +
10L/Ha EM Liquid
100ml/100L Organosilicone

Missed the humates in this spray as we were concerned about it making the Glyphosate inactive. Was a weekend and not able to consult with reps. Turned out the ones we had done with the Humates seemed to go off quicker and died, no problem.

04/11/20 Seed Tick beans, Peas, Buckwheat, Barley, Maize, Oats, Common Vetch,
Sunflower (141kg/Ha)

Symbiosis mix, no further breakdown of seed supplied. Hot topic of discussion, will not use Symbiosis again if this policy continues.

08/11/20 Sprayed 10L/Ha Liquid Humates

Crop was a disaster, never went because it was too dry, some came up, but was stunted and seeded when small.

We planted this paddock because it was supposed to be a La Nina Spring/summer and we were worried about the paddocks on the flat flooding.

Jan 21 Grazed with heifers to get the crop off to reseed permanent mix.

25/03/21 Sprayed 4L/Ha Glyphosate
5L/Ha Agrisea Soil +
3L/Ha EM Fulvic
100ml/100L Organosilicone

26/03/21 Seed 7kg/Ha Rohan
2kg/Ha Barrier Festulolium
2kg/Ha Chicory
3kg/Ha White clover blend (at least 3 different ones)
1kg/Ha Persian clover
2kg/Ha Red clover blend (at least 3 different ones)
3kg/Ha Vision Cocksfoot
3kg/Ha Finesse Tall Fescue
2kg/Ha Brome grass
1kg/Ha Plantain

2kg/Ha Timothy
1kg/Ha Phalaris
5kg/Ha Ryecorn
0.5kg/Ha Phacelia
1kg/Ha Borage
3kg/Ha Daikon Radish
0.6kg/Ha Spinach/Chard blend
Total 38kg/Ha

27/03/21 Pesticide 10kg/Ha Dawn Slug bait

Crop comments:

Same mix as Behind Barn.

This paddock is very wet. Because of the failure of the summer crop, I decided to add more radishes to the permanent mix to try to break up the soil and do the job that the summer crop was supposed to have done.

The crop has done well. We have grazed this about 5 times with lambs. Too tender for cattle. After we sold the last of our lambs we were planning to put cattle in it but we have had too much rain and it's been waiting for about 2 months to dry up enough. It's too good for the ewe hoggets and any other year by October things are drying out and we could put cattle in it, certainly late October. Not the case this year. The plan is still the same, we will wait for it to dry up. Some things will not be as good and might be shaded from the massive amount of plant mass in here but we're confident it will come back when given the chance.

ANALYTICAL REPORT

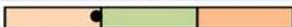
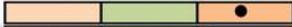
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Fred & Tracey Ody C/- Avoca Whangarei		Avoca Terry Nicolle PO Box 1053 WHANGAREI 0140 NEW ZEALAND +64 21 286 2201 terry@avocagroup.co.nz	

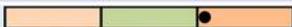
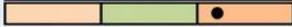
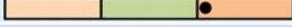


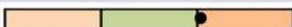
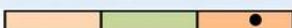
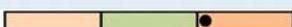
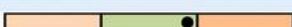
Contact for your orders: Sarah Jones **Order code:** EUNZAU-00302136

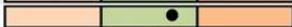
Sample Name	Ridge Paddock
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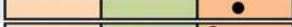
Sample Code:	816-2020-00232565	Soil Type	Sedimentary
Sampling Date:	09/09/2020	Land Use	General Crop
Reception Date:	11/09/2020	Depth (mm)	100
Analysis Ending Date:	17/09/2020		

SOIL TEST RESULTS	Units	Results	Soil Range	Soil Fertility Desired
NU015 pH	pH units	5.9	6~6.5	
NU028 Anion Storage Capacity	%	37	40~80	
◆ NUD09 Effective Cation Exchange Capacity	cmol+/kg	42	12~25	
◆ NUD17 Exchangeable Hydrogen Saturation	%	20	10~15	
◆ NU388 Volume Weight	g/ml	0.58		

ANIONS				
NU252 Olsen Phosphorus	mg/l	34	15~30	
◆ NU049 Bray 2 Phosphorus	mg/l	114	65~160	
◆ NU363 Total Recoverable Phosphorus	mg/kg	1370	800~900	
NU342 Sulfate Sulfur	mg/kg	16	7~12	
NU369 Total Recoverable Sulfur	mg/kg	1090	600~1000	

CATIONS				
NU057 Calcium MAF QT	MAF QT	18	10~15	
◆ NUD04 Exchangeable Calcium	cmol+/kg	23.9		
NU189 Magnesium MAF QT	MAF QT	73	16~24	
◆ NUD05 Exchangeable Magnesium	cmol+/kg	5.44		
NU280 Potassium MAF QT	MAF QT	18	8~12	
◆ NUD06 Exchangeable Potassium	cmol+/kg	1.60		
NU326 Sodium MAF QT	MAF QT	9	1~10	
◆ NUD07 Exchangeable Sodium	cmol+/kg	0.29		

BASE SATURATION				
◆ NUD10 Total Base Saturation	%	81		
◆ NU051 Calcium Base Saturation	%	57	60~80	
◆ NU217 Magnesium Base Saturation	%	13	8~15	
◆ NU171 Potassium Base Saturation	%	3.8	2~5	
◆ NU234 Sodium Base Saturation	%	0.7	1~2	
◆ NUE79 Other Bases	%	5.7		

TRACE ELEMENTS				
◆ NU047 Hot Water Boron	mg/kg	1.1	1~2	
◆ NU098 EDTA Cobalt	mg/kg	0.5	0.5~4	
◆ NU109 EDTA Copper	mg/kg	4.3	0.3~10	
◆ NU169 EDTA Iron	mg/kg	2360	100~1000	
◆ NU197 EDTA Manganese	mg/kg	152	5~100	
◆ NU396 EDTA Zinc	mg/kg	6.8	3~20	

Agri Testing

Sample Name	Ridge		
Analysis Start Date & Time:	19/10/2021 13:57	Analysis Ending Date:	23/10/2021
Depth (mm)	100	Soil Type	Sedimentary
Sample Code:	816-2021-00287671	Land Use	Sheep and Beef Pastoral
Sampling Date:	13/10/2021		
Reception Date:	18/10/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	5.9	5.8~6	
NU028	Anion Storage Capacity	%	37	40~80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	36	12~25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	19	10~15	
◆ NU355	Total Carbon	%	8.6	4~10	
◆ NU259	Organic Matter	%	14.8	7~17	
◆ NU388	Volume Weight	g/ml	0.72		
ANIONS					
NU252	Olsen Phosphorus	mg/l	33	15~20	
◆ NU049	Bray 2 Phosphorus	mg/l	131	50~120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	1230	800~900	
NU342	Sulfate Sulfur	mg/kg	7	6~8	
NU369	Total Recoverable Sulfur	mg/kg	858	600~1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	20	4~10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	21.4		
NU189	Magnesium MAF QT	MAF QT	77	8~10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	4.64		
NU280	Potassium MAF QT	MAF QT	15	4~8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	1.11		
NU326	Sodium MAF QT	MAF QT	13	5~20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	0.35		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	81		
◆ NU051	Calcium Base Saturation	%	59	60~75	
◆ NU217	Magnesium Base Saturation	%	13	6~15	
◆ NU171	Potassium Base Saturation	%	3.0	2~5	
◆ NU234	Sodium Base Saturation	%	1.0	1~2	
◆ NUE79	Other Bases	%	5.7		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	1.3	1~2	
◆ NU098	EDTA Cobalt	mg/kg	0.5	0.5~4	
◆ NU109	EDTA Copper	mg/kg	4.0	4~8	
◆ NU169	EDTA Iron	mg/kg	2510	100~1000	
◆ NU197	EDTA Manganese	mg/kg	108	5~100	
◆ NU396	EDTA Zinc	mg/kg	5.4	3~20	

Behind Barn

Soil type: Sand and sandstone

Area: 3 Ha

History

Always grazed with cattle. Lots of kikuyu thatch on the ridge, flat weeds at the far end. Last minute decision to seed it, trial to see if one spray out and seed with permanent pasture will work in kikuyu paddock.

05/04/21	Sprayed	4L/Ha Glyphosate 5L/Ha Agrisea Soil + 3L/Ha EM Fulvic 100ml/100L Organosilicone
06/04/21	Seed	7kg/Ha Rohan 2kg/Ha Barrier Festulolium 2kg/Ha Chicory 3kg/Ha White clover blend (at least 3 different ones) 1kg/Ha Persian clover 2kg/Ha Red clover blend (at least 3 different ones) 3kg/Ha Vision Cocksfoot 3kg/Ha Finesse Tall Fescue 2kg/Ha Brome grass 1kg/Ha Plantain 2kg/Ha Timothy 1kg/Ha Phalaris 5kg/Ha Ryecorn 0.5kg/Ha Phacelia 1kg/Ha Borage 3kg/Ha Daikon Radish 0.6kg/Ha Spinach/Chard blend Total 38kg/Ha
07/04/21	Pesticide	10kg/Ha Dawn Slug bait

Crop comment:

Same mix as the Ridge paddock but the radishes went mad in here, particularly on the ridge by the gate. This is a very low P part of the farm but it hasn't stopped the radishes from growing a huge amount of top. They were over head height at one stage.

The flat part of the paddock is wet and holds water in patches over the dips in the sandstone, it can't get away by drainage so has to evaporate or transpire.

We haven't been able to graze this as we wanted because of the wet parts. It's a first year crop so we don't want to damage it. We have grazed it 3 times with sheep and we put a hot wire around the ridge at one point and put weaner steers in it to knock it down a bit.

The chickweed has been a problem from the start on the ridge as it has covered the ground and shaded out the smaller growing plants.

The radishes never went down in this paddock. They grew like little turnips and grew a huge amount of top, I guess proving that you don't have to put your roots down if there is enough nutrient on top.

Bottom Hill Left

Soil type: Marine sand with a peat channel

Area: 2.5 ha

History

Always grazed with cattle, lots of thatch. Last minute decision to seed it, trial to see if you can direct drill into a very thatchy paddock and still have a good take. Put into a winter silage mix.

07/04/21	Sprayed	4L/Ha Glyphosate 5L/Ha Agrisea Soil + 3L/Ha EM Fulvic 100ml/100L Organosilicone
09/04/21	Seed	40kg/Ha Ryecorn 15kg/Ha Black Oats 15kg/Ha Barley 4kg/Ha Sultan ryegrass 0.25kg/Ha Forage rape 3kg/Ha Crimson Clover 2kg/Ha Red Clover blend 3kg/Ha White Clover blend 4kg/Ha Berseem Clover 1kg/Ha Lotus 3kg/Ha Tall Fescue 2kg/Ha Cocksfoot 1kg/Ha Teff 2kg/Ha Chicory 1kg/Ha Daikon Radish 0.5kg/Ha Phacelia 2kg/Ha Brome grass Total 98kg/Ha
10/04/21	Pesticide	10kg/Ha Dawn slug bait

Salt water flood end of May, burnt some of it.

Crop comment:

Same mix as the Bottom Orchard Flat but not summer cropped beforehand.

Amazingly the grasses recovered from the salt water burn and kept going. This crop has gone well. We have grazed this 4 times with lambs and once with weaner steers when it was dry enough. The salt water flooding ruins the drainage for a long time, so any rain we got sat on the paddock. Have a look at the soil tests and the massive lift in sodium levels.

Shut up mid September for a 2 month growth period to make into silage.

Once cut, there is enough other plants in here that will take over to be a summer crop for lamb finishing.

Options: pit silage, baleage or graze off.

Sample Name Home Flats

Sample Code: 816-2020-00296604
Sampling Date: 11/11/2020
Reception Date: 13/11/2020
Analysis Ending Date: 19/11/2020

Soil Type Sedimentary
Land Use Sheep and Beef Pastoral
Depth (mm) 100

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	6.0	5.8~6	
NU028	Anion Storage Capacity	%	52	40~80	
◆NUD09	Effective Cation Exchange Capacity	cmol+/kg	37	12~25	
◆NUD17	Exchangeable Hydrogen Saturation	%	15	10~15	
◆NU388	Volume Weight	g/ml	0.65		
ANIONS					
NU252	Olsen Phosphorus	mg/l	7	15~20	
◆NU049	Bray 2 Phosphorus	mg/l	34	50~120	
◆NU363	Total Recoverable Phosphorus	mg/kg	1180	800~900	
NU342	Sulfate Sulfur	mg/kg	23	6~8	
NU369	Total Recoverable Sulfur	mg/kg	1370	600~1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	21	4~10	
◆NUD04	Exchangeable Calcium	cmol+/kg	25.4		
NU189	Magnesium MAF QT	MAF QT	46	8~10	
◆NUD05	Exchangeable Magnesium	cmol+/kg	3.06		
NU280	Potassium MAF QT	MAF QT	8	4~8	
◆NUD06	Exchangeable Potassium	cmol+/kg	0.67		
NU326	Sodium MAF QT	MAF QT	9	5~20	
◆NUD07	Exchangeable Sodium	cmol+/kg	0.25		
BASE SATURATION					
◆NUD10	Total Base Saturation	%	85		
◆NU051	Calcium Base Saturation	%	69	60~75	
◆NU217	Magnesium Base Saturation	%	8.3	6~15	
◆NU171	Potassium Base Saturation	%	1.8	2~5	
◆NU234	Sodium Base Saturation	%	0.7	1~2	
◆NUE79	Other Bases	%	5.4		
TRACE ELEMENTS					
◆NU047	Hot Water Boron	mg/kg	1.7	1~2	
◆NU098	EDTA Cobalt	mg/kg	1.8	0.5~4	
◆NU109	EDTA Copper	mg/kg	5.6	4~8	
◆NU169	EDTA Iron	mg/kg	1830	100~1000	
◆NU197	EDTA Manganese	mg/kg	101	5~100	
◆NU396	EDTA Zinc	mg/kg	5.7	3~20	

Agri Testing

Sample Name	Home Flats		
Analysis Start Date & Time:	19/10/2021 13:57	Analysis Ending Date:	23/10/2021
Depth (mm)	100	Soil Type	Sedimentary
Sample Code:	816-2021-00287670	Land Use	Sheep and Beef Pastoral
Sampling Date:	13/10/2021		
Reception Date:	18/10/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	6.0	5.8~6	
NU028	Anion Storage Capacity	%	59	40~80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	39	12~25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	15	10~15	
◆ NU355	Total Carbon	%	12.4	4~10	
◆ NU259	Organic Matter	%	21.3	7~17	
◆ NU388	Volume Weight	g/ml	0.60		
ANIONS					
NU252	Olsen Phosphorus	mg/l	4	15~20	
◆ NU049	Bray 2 Phosphorus	mg/l	22	50~120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	1260	800~900	
NU342	Sulfate Sulfur	mg/kg	25	6~8	
NU369	Total Recoverable Sulfur	mg/kg	1560	600~1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	17	4~10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	22.3		
NU189	Magnesium MAF QT	MAF QT	64	8~10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	4.69		
NU280	Potassium MAF QT	MAF QT	13	4~8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	1.16		
NU326	Sodium MAF QT	MAF QT	88	5~20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	2.72		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	85		
◆ NU051	Calcium Base Saturation	%	58	60~75	
◆ NU217	Magnesium Base Saturation	%	12	6~15	
◆ NU171	Potassium Base Saturation	%	3.0	2~5	
◆ NU234	Sodium Base Saturation	%	7.0	1~2	
◆ NUE79	Other Bases	%	5.4		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	2.3	1~2	
◆ NU098	EDTA Cobalt	mg/kg	1.6	0.5~4	
◆ NU109	EDTA Copper	mg/kg	6.2	4~8	
◆ NU169	EDTA Iron	mg/kg	2380	100~1000	
◆ NU197	EDTA Manganese	mg/kg	103	5~100	
◆ NU396	EDTA Zinc	mg/kg	5.3	3~20	

The plan

We have 4 paddocks to put into summer crop this year (if it ever dries up enough to get the seed in!). We are looking to do 2 paddocks sprayed out and 2 paddocks not sprayed out. We have 2 paddocks next to each other, one we'll spray and the other we won't so hopefully easy to compare as they will be the same soil types and moisture levels. All crops this spring will be direct drilled. It saves a lot of time for us and hopefully we won't get as many weeds. If necessary, we can cultivate these paddocks in the autumn before they go back into perennial pasture.

The dry last year was a problem for some sprayed out paddocks. We had a big failure in one paddock where the birds got the majority of the crop and we had nothing left. Also another paddock where it was too dry for the crop to grow and we ended up with not much of anything because it had been sprayed out. We floated the idea of not spraying: 1. if we have a massive failure at least we've still got a paddock of grass. 2. We want to use less spray if at all possible and preferably none but with kikuyu it's almost impossible, so we'll try it in the spring when the kikuyu is less dominant and not growing as much. Only thing is that this year is wet, everything is growing fast and hoping that the crops get a go instead of being swamped by what is already there. The idea was to cover us in a dry year but we'll try it in a wet year anyway and see how it goes. Might decide to only do one paddock unsprayed, given the rate of grass growth and moisture levels at the moment.

We're going with the same mix in each paddock this year. The mix is based on what worked for us last year. If we lose the popcorn to birds this year we might have to reconsider using maize or popcorn in future mixes. Last year the birds took the lot. There is some more things added to try and see how they go. They're all short term other than the vetch and the red clover. I put the red clover in there as a ground cover to hopefully beat the weeds and even though it is expensive seed, if we spray out in the autumn, the red clover should survive a glyphosate spray out.

Spring 2021 mix:	10kg/Ha Popcorn
	2kg/Ha Sunflowers
	4kg/Ha Japanese Millet
	20kg/Ha Black Oats
	20kg/Ha AP2 Peas
	10kg/Ha Common Vetch
	5kg/Ha Buckwheat
	4kg/Ha Red Clover
	20kg/Ha Barley

Total	95kg/Ha
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Likely 2 paddocks of this mix will be made into pit silage. The other 2 will be grazed off. The ones to be grazed are less suited to harvesting; a long way from the pit, bad shape or too rough to be harvested well. Previously we have harvested them, the good thing about grazing them off of course is that all that mass stays on the paddock in the form of crushed organic matter or manure from the grazing animal. In the past we have needed the silage and have used these summer crops as a set up crop and a silage crop in one, if I'm going to all this cost and effort to grow them, they have to be utilized as we need them to be.

One good thing about the rain is that we haven't had to use last years' silage so we have more options about the utilization of our crops this spring and summer.

Agri Testing

ANALYTICAL REPORT

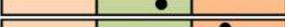
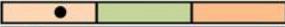
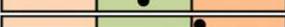
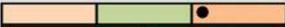
REPORT CODE	AR-21-NU-081882-01	REPORT DATE	18/09/2021
Fred & Tracey Ody C/- Avoca Whangarei		Avoca Briar Philcox PO Box 1053 WHANGAREI 0140 NEW ZEALAND +64 21 883 182 briar@avocagroup.co.nz	

Contact for your orders:	Sarah Jones	Order code:	EUNZAU-00405283
Sample Name	Stone Paddock Ridge		
Analysis Start Date & Time:	15/09/2021 15:22	Analysis Ending Date:	18/09/2021
Depth (mm)	150	Soil Type	Sedimentary
Sample Code:	816-2021-00249897	Land Use	Sheep and Beef Pastoral
Sampling Date:	10/09/2021		
Reception Date:	14/09/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	6.2	5.8~6	
NU028	Anion Storage Capacity	%	29	40~80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	25	12~25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	12	10~15	
◆ NU355	Total Carbon	%	6.6	4~10	
◆ NU259	Organic Matter	%	11.4	7~17	
◆ NU388	Volume Weight	g/ml	0.83		
ANIONS					
NU252	Olsen Phosphorus	mg/l	53	15~20	
◆ NU049	Bray 2 Phosphorus	mg/l	111	50~120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	1200	800~900	
NU342	Sulfate Sulfur	mg/kg	7	6~8	
NU369	Total Recoverable Sulfur	mg/kg	669	600~1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	17	4~10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	16.1		
NU189	Magnesium MAF QT	MAF QT	62	8~10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	3.25		
NU280	Potassium MAF QT	MAF QT	20	4~8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	1.28		
NU326	Sodium MAF QT	MAF QT	8	5~20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	0.17		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	88		
◆ NU051	Calcium Base Saturation	%	64	60~75	
◆ NU217	Magnesium Base Saturation	%	13	6~15	
◆ NU171	Potassium Base Saturation	%	5.1	2~5	
◆ NU234	Sodium Base Saturation	%	0.7	1~2	
◆ NUE79	Other Bases	%	5.2		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	0.9	1~2	
◆ NU098	EDTA Cobalt	mg/kg	1.3	0.5~4	
◆ NU109	EDTA Copper	mg/kg	5.0	4~8	
◆ NU169	EDTA Iron	mg/kg	2520	100~1000	
◆ NU197	EDTA Manganese	mg/kg	184	5~100	
◆ NU396	EDTA Zinc	mg/kg	22.1	3~20	

Agri Testing

Sample Name	Below Triangle Dick's		
Analysis Start Date & Time:	15/09/2021 15:22	Analysis Ending Date:	18/09/2021
Depth (mm)	150	Soil Type	Sedimentary
Sample Code:	816-2021-00249898	Land Use	Sheep and Beef Pastoral
Sampling Date:	10/09/2021		
Reception Date:	14/09/2021		

SOIL TEST RESULTS	Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015 pH	pH units	6.3	5.8~6	
NU028 Anion Storage Capacity	%	67	40~80	
◆ NUD09 Effective Cation Exchange Capacity	cmol+/kg	39	12~25	
◆ NUD17 Exchangeable Hydrogen Saturation	%	11	10~15	
◆ NU355 Total Carbon	%	9.3	4~10	
◆ NU259 Organic Matter	%	16.0	7~17	
◆ NU388 Volume Weight	g/ml	0.63		
ANIONS				
NU252 Olsen Phosphorus	mg/l	9	15~20	
◆ NU049 Bray 2 Phosphorus	mg/l	14	50~120	
◆ NU363 Total Recoverable Phosphorus	mg/kg	724	800~900	
NU342 Sulfate Sulfur	mg/kg	25	6~8	
NU369 Total Recoverable Sulfur	mg/kg	1230	600~1000	
CATIONS				
NU057 Calcium MAF QT	MAF QT	20	4~10	
◆ NUD04 Exchangeable Calcium	cmol+/kg	24.3		
NU189 Magnesium MAF QT	MAF QT	83	8~10	
◆ NUD05 Exchangeable Magnesium	cmol+/kg	5.74		
NU280 Potassium MAF QT	MAF QT	16	4~8	
◆ NUD06 Exchangeable Potassium	cmol+/kg	1.31		
NU326 Sodium MAF QT	MAF QT	46	5~20	
◆ NUD07 Exchangeable Sodium	cmol+/kg	1.36		
BASE SATURATION				
◆ NUD10 Total Base Saturation	%	90		
◆ NU051 Calcium Base Saturation	%	63	60~75	
◆ NU217 Magnesium Base Saturation	%	15	6~15	
◆ NU171 Potassium Base Saturation	%	3.4	2~5	
◆ NU234 Sodium Base Saturation	%	3.5	1~2	
◆ NUE79 Other Bases	%	5.1		
TRACE ELEMENTS				
◆ NU047 Hot Water Boron	mg/kg	1.6	1~2	
◆ NU098 EDTA Cobalt	mg/kg	3.6	0.5~4	
◆ NU109 EDTA Copper	mg/kg	6.8	4~8	
◆ NU169 EDTA Iron	mg/kg	2030	100~1000	
◆ NU197 EDTA Manganese	mg/kg	231	5~100	
◆ NU396 EDTA Zinc	mg/kg	11.7	3~20	

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Sample Name	Lucerne Paddock		
Analysis Start Date & Time:	15/09/2021 15:22	Analysis Ending Date:	18/09/2021
Depth (mm)	150	Soil Type	Sedimentary
Sample Code:	816-2021-00249900	Land Use	Sheep and Beef Pastoral
Sampling Date:	10/09/2021		
Reception Date:	14/09/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	6.0	5.8~6	
NU028	Anion Storage Capacity	%	30	40~80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	21	12~25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	15	10~15	
◆ NU355	Total Carbon	%	6.3	4~10	
◆ NU259	Organic Matter	%	10.8	7~17	
◆ NU388	Volume Weight	g/ml	0.83		
ANIONS					
NU252	Olsen Phosphorus	mg/l	5	15~20	
◆ NU049	Bray 2 Phosphorus	mg/l	22	50~120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	742	800~900	
NU342	Sulfate Sulfur	mg/kg	6	6~8	
NU369	Total Recoverable Sulfur	mg/kg	664	600~1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	15	4~10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	14.7		
NU189	Magnesium MAF QT	MAF QT	35	8~10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	1.86		
NU280	Potassium MAF QT	MAF QT	5	4~8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	0.30		
NU326	Sodium MAF QT	MAF QT	6	5~20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	0.14		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	85		
◆ NU051	Calcium Base Saturation	%	69	60~75	
◆ NU217	Magnesium Base Saturation	%	8.8	6~15	
◆ NU171	Potassium Base Saturation	%	1.4	2~5	
◆ NU234	Sodium Base Saturation	%	0.7	1~2	
◆ NUE79	Other Bases	%	5.4		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	0.7	1~2	
◆ NU098	EDTA Cobalt	mg/kg	0.5	0.5~4	
◆ NU109	EDTA Copper	mg/kg	2.6	4~8	
◆ NU169	EDTA Iron	mg/kg	1450	100~1000	
◆ NU197	EDTA Manganese	mg/kg	99	5~100	
◆ NU396	EDTA Zinc	mg/kg	6.0	3~20	

Sample Name	Turnip Patch		
Analysis Start Date & Time:	15/09/2021 15:23	Analysis Ending Date:	18/09/2021
Depth (mm)	150	Soil Type	Sedimentary
Sample Code:	816-2021-00249901	Land Use	Sheep and Beef Pastoral
Sampling Date:	10/09/2021		
Reception Date:	14/09/2021		

SOIL TEST RESULTS		Units	Results	◆Soil Range	◆Soil Fertility Desired
NU015	pH	pH units	6.2	5.8-6	
NU028	Anion Storage Capacity	%	54	40-80	
◆ NUD09	Effective Cation Exchange Capacity	cmol+/kg	18	12-25	
◆ NUD17	Exchangeable Hydrogen Saturation	%	12	10-15	
◆ NU355	Total Carbon	%	9.3	4-10	
◆ NU259	Organic Matter	%	16.0	7-17	
◆ NU388	Volume Weight	g/ml	0.71		
ANIONS					
NU252	Olsen Phosphorus	mg/l	4	15-20	
◆ NU049	Bray 2 Phosphorus	mg/l	28	50-120	
◆ NU363	Total Recoverable Phosphorus	mg/kg	742	800-900	
NU342	Sulfate Sulfur	mg/kg	9	6-8	
NU369	Total Recoverable Sulfur	mg/kg	964	600-1000	
CATIONS					
NU057	Calcium MAF QT	MAF QT	12	4-10	
◆ NUD04	Exchangeable Calcium	cmol+/kg	13.1		
NU189	Magnesium MAF QT	MAF QT	23	8-10	
◆ NUD05	Exchangeable Magnesium	cmol+/kg	1.40		
NU280	Potassium MAF QT	MAF QT	6	4-8	
◆ NUD06	Exchangeable Potassium	cmol+/kg	0.45		
NU326	Sodium MAF QT	MAF QT	7	5-20	
◆ NUD07	Exchangeable Sodium	cmol+/kg	0.17		
BASE SATURATION					
◆ NUD10	Total Base Saturation	%	88		
◆ NU051	Calcium Base Saturation	%	72	60-75	
◆ NU217	Magnesium Base Saturation	%	7.7	6-15	
◆ NU171	Potassium Base Saturation	%	2.4	2-5	
◆ NU234	Sodium Base Saturation	%	0.9	1-2	
◆ NUE79	Other Bases	%	5.2		
TRACE ELEMENTS					
◆ NU047	Hot Water Boron	mg/kg	0.8	1-2	
◆ NU098	EDTA Cobalt	mg/kg	0.5	0.5-4	
◆ NU109	EDTA Copper	mg/kg	4.1	4-8	
◆ NU169	EDTA Iron	mg/kg	977	100-1000	
◆ NU197	EDTA Manganese	mg/kg	110	5-100	
◆ NU396	EDTA Zinc	mg/kg	33.7	3-20	

REPORT INFORMATION

Sheep and Beef desired plot ranges for Olsen P (15-20), Sulfate S (6-8) and MAF K (4-8) have been lowered to reflect more realistic economic target values for extensive, dryland, hill, sheep and beef properties. The remaining field calibrated tests: pH, QTCa, QTMg, QTNa, Extractable Organic S & Total S biological optimums are defined as 97% of max pasture production across all relevant field trials. All other desired ranges are provided as an indication of qualitative low, medium or high values based on reference data available, these "text book" values may not reflect local soils, climate, or terrain and should therefore be used with caution.

Anion Storage Capacity is an inherent property of the soil, a plot is only provided to indicate if the soil is classified as low, medium, or high; rather than indicating an actual desired value. Typical values for different soil types: Volcanic soils >80%, pumice 50-70%, sedimentary 30-50%, most peats, podzols and fine textured soils are usually less than 20%. To reduce possible leaching losses of P and S fertilisers, it is advisable to apply slow release P and S fertilisers when the soil ASC < 40% on mineral soils and for peat soils when ASC < 60%.

MAF Mg levels of 8-10 are adequate for pasture growth. MAF Mg levels of less than 25 may limit animal Mg supply and cause metabolic disorders during calving/lambing. For animal nutrition MAF Mg levels of 25-30 will generally provide plant Mg concentrations of 0.22% or higher.