

Farmers Digging Deeper

Demonstration Site

Tracy dairy farm, Waratah Bay



Demonstration site

- Established in May 2022
- Goal to measure effects of a regenerative approach to pasture management and compare to a more conventional approach
- Questions:
 - Is a regenerative approach to farming in our high rainfall environment an economically viable alternative to a conventional high input approach?
 - Are multispecies crops and pastures more resilient and productive than less diverse ones?



Activities and treatments

Conventional side	Regenerative side
Annual ryegrass/clover in winter, millet and forage rape crop in summer	Annual multispecies pastures (sown in Autumn and Spring)
DAP fertiliser (synthetic granulated Nitrogen and Phosphorous)	Alternative fertilisers to feed soil biology; molasses, Rhizovator (fish hydrolysate/humate/seaweed mix), biocast (worm juice) to stimulate seed
Urea (in Autumn crop)	No urea
Yeomans plough to aerate soil each crop	Yeomans plough to aerate soil each crop (also used to add biological stimulants)
Spray paddock with glyphosate between crops	Spray half rate for summer crops to minimise competition
Mulching to remove fat hen stalks	Mulching to feed soil biology with crop residue

First crop May 2022

Slugs!



Second crop sown December 2022

Conventional, forage rape and millet, monitoring first graze Feb 23



Second crop sown December 2022

Regenerative, multispecies mix, monitored first graze Feb 23:

Millet, Forage Rape, Tillage Radish, Chicory, Vetch, Clover, Buckwheat, Sunflower, Linseed



Monitoring in April 23 before second graze -
conventional



Monitoring in April 23 before second graze - regenerative



Third crop sown May 2023

Conventional, ryegrass and clover, monitored first graze August 23



Monitoring in September 23 before second graze - conventional



Third crop sown May 2023

Regenerative, Multispecies (with left over brassicas from previous crop)
monitored first graze August 23:

Chicory, Vetch, Clover, Ryegrass, Oats, Forage rape, Tillage Radish,



Monitoring in September 23 before second graze - regenerative



Fourth crop sown November 2023

Conventional, forage rape and millet, monitored Feb 24



Fourth crop sown November 2023

Regenerative, multispecies (with left over brassicas from previous crop),
monitored Feb 24:

Chicory, Vetch, Clover, Ryegrass, Oats, Forage rape, Tillage Radish,



Monitoring methods

- Soil tests, May 22, Oct 22, Oct 23, chemistry & biology. Plus soil carbon baseline at start
- Penetrometer
- Quadrats to record species present and weight
- Rising plate meter
- Forage tests
- Visual Soil Assessment
- Photos

Soil biology test results

- High ciliates indicating waterlogged soil and possibly anaerobic throughout, except for final test on regen side where it had improved
- No active fungi on conventional side, but present on regen side (low numbers, could be due to cold wet conditions)
- Active bacteria and nitrogen cycling potential higher on regen side in final test

Soil chemistry test results

Comparison between conventional and regen in October 23 final test:

- Soluble Ca, Mag, Potassium are all higher on the regen side, although both plot values were in the acceptable range for the soil type. The exception was soluble phosphorus on the regen side, which was low (3.2).
- Plant available P (Bray 1 test) nitrate nitrogen, ammonium nitrogen and sulphur all showed similar levels between the plots, and were in the acceptable-high range.
- Exchangeable and total nutrient levels are all higher on the regen side, excepting silicon. The total pool of boron and copper was low on the conventional side, while molybdenum and cobalt were low on both sides. Sodium and magnesium are still higher than desirable.

Results

Date monitored	DM		ME		Crude Protein		Non Fibre Carbohydrates		Calcium		Wet weight (kg)		t/ha DM	
	Con	Regen	Con	Regen	Con	Regen	Con	Regen	Con	Regen	Con	Regen	Con	Regen
4/10/2022	20.8	21.6	11.47	10.96	18.9	16.5	30.8	28	0.25	0.33				
24/02/2023	18.1	17.5	9.08	9.93	14.3	15.5	23.7	38.7	0.77	1.23	0.39	0.49	2.8	3.4
3/04/2023	18.7	16.5	10.23	10.52	18.8	21.1	33.1	38.6	0.98	1.17	0.4	0.4	3.0	2.6
4/08/2023	10.3	16.1	11.09	11.52	26.4	24.8	20.8	33	0.56	0.89	0.3	0.7	1.2	4.5
25/09/2023	15.2	17.7	11.12	11.76	22	24.4	27.4	32.7	0.66	0.78	0.6	0.8	3.6	5.7
5/02/2024	14.4	12.6	9.09	10.48	13.4	18.3	24.6	41.1	0.98	1.48	0.6	1	3.5	5.0
Average	16.2	17.0	10.4	10.9	19.0	20.1	26.7	35.4	0.7	1.0	0.5	0.7	2.8	4.3

Input costs

Summer crop 22/23

Activity	Cost/ha	
	Conventional	Regen
Sow seeds	128	173
Spray glyphosate	43.5	43.5
DAP	180	
Urea		
Effluent	250	250
Rhizovator		44
K-humate		31
Molasses		8
Biocast worm juice		2
Aerate with Yeomans plough	150	150
Tow and fert		60
Total cost/ha	752	762

Summer crop 23/24

Activity	Cost/ha	
	Conventional	Regen
Sow seeds	198	184
Spray glyphosate	39	33
DAP	155	
Rhizovator		35
K humate		25
Molasses		5
Tow and fert		60
Pesticide (for army worm)	147	
Aerate w/ Yeomans plough	150	150
Total/ha	690	492

Input costs

Autumn/winter crop 23

	Cost/ha	
Activity	Conventional	Regen
Sow seeds	165	170
Slug bait	30	30
Spray glyphosate	155	
DAP	180	
Urea	166	24.8
Rhizovator		40
Molasses		4.37
Biocast worm juice		15
Biomax soluble humate		40
Aerate with Yeomans plough	150	150
Tow and fert		60
Total cost/ha	846	534

Total cost and benefits

	Conventional	Regenerative
Cost	\$2,287	\$1,787
Total t/ha DM	14	21
Cost per t DM	\$161	\$84

Monitoring observations

Similar percentage groundcover.

Regenerative (multispecies) side showed:

- Higher DM, rising plate meter readings, ME, protein, NFC,
- Calcium is a bit low on conventional, consistently higher on regen side with both fodder and tissue test
- Total t DM higher by 33%
- Lower weeds
- Some preference observed when cows grazing
- Improved drought resilience
- Less pressure from pests including insects and swan grazing
- Minimum till promotes slugs so may need to bait
- Penetrometer 50% deeper
- During wet conditions soil drier and more spongy, better drained and aerated
- Double number of worms in VSA













Thank you

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