



Resilient Farming Systems

**Waiau Station –
Dave Read & Judy Bogaard”**

Rod Savage

Agricultural Consultant

AgFirst Pastoral (HB) Ltd

New Zealand

Physical info

1200 ha Steep Hill country “on the move”

- 1050 ha effective
- 30 ha Heavy Kanuka
- 22 ha QE II native
- 100 ha scattered bush gorges

Soils

- YBP, ash, mudstone & sandstone
 - Med – good fertility
 - 120 Paddocks range 3 -20 ha
-

Stock

- 3600 ewes plus replacements
 - Lambing 135%
 - 430 cows plus replacements
 - 540 other cattle in various age classes
 - Sheep : Cattle Ratio 55 : 45
 - Stocking Rate 11.5 – 12.0
-

Goals of the Farming Business

- Long term biological sustainability
 - Stock that are resilient/ tolerant to internal parasites, fly and eczema
 - Within the above constraints maximise production
-

Key Areas to discuss - Current policies adding to resilience

- Pole Planting for erosion control – costs plus other benefits
 - Stock selection policy
 - Goat policy
 - Buffer mobs
 - Current woodlots & native bush areas
-

Key Areas to discuss – Potential policies adding to resilience

- Reversion block 50 ha - options
 - Differential Fertiliser Management
 - Browse block
 - Deferred grazing
-

Dave's programme for pole establishment – current policy

- Where
 - Variety
 - What sort of pole
 - Spacing
 - Grazing Management and success post ramming
 - Numbers per year (300) and target total (trees per paddock) - 50 per paddock / 6000 total
-







Cost of Establishment

- Programme supported by HBRC
 - 50 % funding support
 - \$6 pole net cost to Waiau Station
 - \$2000 spend to qualify
-

Planting for Erosion control

Soil slip erosion can result in dramatic reductions in pasture production for decades

On Waiau Station Dave's thought is:-

- Reduction in severity of big events
 - Small events are definitely reduced
 - Soil particle movement in planted areas minimised
-

Planting for Erosion control (cont)

Dave's programme

- 70% in Gullies – planting in areas he thinks will go
 - Sediment input to watercourses can be reduced 22% - 78% depending
 - 20% on Erosion Scars
 - Mass movement in soil can be reduced 50% - 80%
 - 10% along Watercourses
 - Flood damage reduced by 30% - 80%
-

Economics for planting for Erosion control

Hard to accurately calculate the economics as so much variability from site to site

- Reduced sediment
- Reduced mass movement
- Reduced Flood damage

KEY POINT

Any Pasture suppressed by trees is counterbalanced by better growth on areas that would be lost to erosion

Proof in Pudding

- 300 poles cost \$1800 per year
 - SR has significantly increased since planting started (SR 8 to 12)
 - Less visual soil loss and erosion events
 - Very visible Payback in drought years
 - Without doubt a more resilient landscape
-

Harvesting Willow for fodder in drought – Current policy

- Safety
 - Mechanics of harvest
 - 1 man harvest 6 -7 trees per hour (15 c kg DM)
-







Harvesting for fodder in drought

Some simple economics based on limited research that can be practically achieved in the future on this farm

Wellington Reg.C,Baker &Assoc, Institute of Veterinary@Massey, Riverside Farm Research Trust

4100 ewes to be mated in a drought situation

- 10 weeks with willow at 0.2 kg day = 820 kgs DM day
- 40 trees day X 70 days = 2800 trees (Costs \$8400)
- Research tells us expect min 12% increase in weaning %
- So we have 492 more lambs at \$55 = \$27,060

\$18,660 benefit

NB does not include establishment

Discussion of economics on willow fodder



- Supplementing ewes at tugging with willow consistently increased weaning nos -12 -18%
 - Willow was of high ME value and contained condensed tannins
 - Poles are planted for erosion control – but 15c kg DM in a drought is cheap feed at tugging and one of the few options you can use on the hill
 - Feeding will help retain capital stock & genetics
 - Good pro–active drought activity
-

Other factors

- Animal welfare (shade) – get ahead of the game – the market will tell us
 - Shelter for performance – animals have always told us – little research in S&B
 - ref Dairy 1.5 % increase in MS
-

Summary of Pole policy for resilience

- Reduces erosion and nutrient loss
 - Positive economic feed value in droughts
 - Shelter & Animal Welfare
 - Animal performance
 - Aesthetic value – farmer and consumer
-

Woodlots & QE II for resilience



Current policy

- 3.5 hectares of Lusitanicas and Radiata
- 22 ha Good Native for QE II
- 30 ha Heavy Kanuka

.....all good practice



Areas of Potential policy -for resilience

Reversion block of 50 ha

- Low production / well below average return for the farm
 - Erodible – poor soil type
 - Fenced
 - Same relative inputs
 - Current productive capacity = 4 SU / ha (best 14-15 SU)
-





Options for the 50 ha “Reversion block”

- Status quo or are inputs better spent elsewhere
- Let it revert to native and claim Carbon Credits
- Plant in in a Carbon Forest (harvest or non harvest)

Carbon - Returns look good / international rules are still under negotiation

Potential to integrate carbon farming into hill country pastoral system

50 ha Reversion block – the economics



FARMAX modelled this area produces GM of **\$225** per ha compared to the rest of the farm **\$586** per ha

This area gets regular fertiliser and regular spray to keep it grazeable... plus incurs other costs

..... lets look at shutting the gate & diverting inputs into areas with greater productive potential

50 ha Reversion block – the opportunity



So what is our main input savings on the 50 ha if we take it out of the pastoral equation

- Fertiliser \$4,500
- Scrub spray \$1,500
- Sale of surplus stock \$16,000

Total of \$22 K

.....Lets direct that saving of expenditure (& capital stock sales income) into a block with better soils more potential

100 ha Capital fert block

- 22K will give us Capital Fertiliser on 100 ha
- Olsen P increases from 12 to 20
- 100 ha produces 1300 kgs more DM per ha after 2 years

So what is our whole farm result for 1000 hectares once fully implemented ?

Cash Flow summarised

1050 ha v 1000 ha



Cash Farm Surplus 1050 ha **\$371,382**

Cash Farm Surplus 1000 ha **\$374,783**

To examine Payback period

	Year 1	Year 2	Year 7	Year 10	Year 20
Net Cash Position	-\$12,000	-\$21,000	\$920	\$14,000	\$57,000
Carbon Credits	?	?	?	?	?



KEY POINT

“This modelled example demonstrates that extra returns can be gained from diverting inputs from land areas of poor potential to land areas of good pastoral potential in the medium term”

.....in a farming sense

Areas of Potential policy - for resilience

Fertiliser Policy for Waiau Station

- Confused ridge system
- Fruit salad of aspect & soil types in relatively small areas
- Native & scrub areas
- Watercourses
- Fertility transfer areas
- Stock camps

How much is unproductive ?

Fertiliser Policy – (cont)

- We want to grow the same amount of pasture (or more)
- We want to match nutrient input to demand
- We want to do it for less spend
- Good environmental citizen

.....Lets take a helicopter ride & look precision application





Fertiliser Policy

Fixed wing v Helicopter

2010 Pricing - 20 P per ha

Fert	Rate	Cost /t	Mode	C&S	Ha	Cover	Actual	Total
RPR	.175	\$400	Plane	\$100	1050	100%	1050	92K
RPR	.175	\$400	Heli	\$225	1050	80%	840	92K
RPR	.175	\$400	Heli	\$225	1050	70%	735	80K

Future Pricing - 20 P per ha

Fert	Rate	Cost /t	Mode	C&S	Ha	Cover	Actual	Total
RPR	.175	\$535	Plane	\$100	1050	100%	1050	116K
RPR	.175	\$535	Heli	\$225	1050	80%	840	112K
RPR	.175	\$535	Heli	\$225	1050	70%	735	98K

KEY POINTS

- If more than 20% of the usual spread area of this farm is scattered trees, stock camps, unproductive, waterways etc potentially you could using a more precision approach
- Add to this differential management (treating areas by productive units) you could save over \$20K versus the traditional approach on this farm
- Higher phosphate pricing will be a big driver

.....best practice for land use

SUMMARY of Waiaiu Station



- Planting Poles for erosion control – it works
- Harvesting trees for fodder pays in droughts
- Diverting expenditure to better land classes pays dividends
- Differential management of fertiliser has big potential as phosphate prices rise

....all these policies add to resilience of this farm
