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Wealth from Water

- Imagine Mid Canterbury without the RDR (33,000 ha)
 - ❖ built in the 1930's
 - ❖ uneconomic in the 1950's
 - ❖ the lowest cost scheme in NZ in the 1990's
 - ❖ under capacity to meet modern technology demands in 2010
 - ❖ creator of wealth & opportunity for those utilising its water resource efficiently
 - ❖ creator of business wealth & social stability for those servicing farmers

RDR	33,000 ha
New schemes	226,000 ha
including:	
Central Plains	84,000 ha (max)

Key Issues

New phase of irrigation development:

- a) Schemes are getting more expensive
 - b) Developments need to be driven by end users
 - c) Participation is voluntary
 - d) Schemes are, and must be promoted as, multi-purpose:
 - ❖ productivity increases
 - ❖ community wealth
 - ❖ environmental enhancement
 - ❖ recreational resource
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- 60,000 ha of irrigation will influence the productivity of at least 100,000 ha
 - The economics will work well for the community
 - They don't always work for the individual
 - Changes in land use and land tenure are inevitable
 - The rural servicing infrastructure needed to support 60,000 ha of irrigation output is huge

What have we learnt?

Community schemes:

- It usually costs more than planned!

- Twenty years later they look cheap

- Many under-designed as shareholders under-estimate their future water demands

- The people voting for / against a scheme are often not the ones who will use the water

- Many schemes are therefore best designed in bite sized lumps with capacity to expand once farmers are more confident in using water effectively

- New technology enables the use of water over a larger area in some older schemes

- Increases in potential production lead to:
 - ❖ diversification and intensification of land use
 - ❖ capital gains
 - ❖ changes in ownership
 - ❖ changes in management

- Successful implementation relies on excellent communication, trust and co-operation within the scheme membership and interested parties

- Your children will thank you for providing more flexibility to resolve problems, rather than paying off debt for them. Don't sacrifice that flexibility for short term cost savings!

From your own perspective

- Don't under-estimate the proportion of the farm you wish to irrigate
- You will use more water than you currently think
- Reticulate as large an area as possible to allow for shoulder season irrigation
- Design your farm management system to allow up to 5 mm / day water to core crop and pasture
- Irrigation response per mm is linear up to 5 mm / day as long as management is not limiting
- $5\text{mm/day} = 35\text{ mm/week} = 0.575\text{ l/sec/ha}$
- $3.5\text{mm/day} = 25\text{mm/week} = 0.41\text{ l/sec/ha}$
- Reliability of supply is critical
- Crop yields are as good as the most limiting week of moisture
- Irrigated soils improve their organic matter content over time unless very intensively cropped
- Increasing organic matter leads to higher moisture holding capacity, higher worm & microbial activity, and higher nutrient holding capacity
- You only have to shift a fence once, irrigators need moving every day. Don't be afraid to shift the fence!
- Trees re-grow - fast. Be prepared to lose shelter. Replant immediately with ten trees for every one taken out!

- Design the system to allow an expansion of the scheme in the future
- Irrigation development is more than just the scheme itself. Associated costs often add \$500 / ha to the development costs. This is often the best spent money as already developed farms usually achieve a higher return in the initial years

Debt!

- Keep it relative to output and net profit
- Ensure you borrow enough to complete the non-irrigation part of the development so that other factors do not limit output from irrigation
- That means: fencing, shelter, fertiliser, silos, re-grassing, machinery, working capital, livestock, etc
- Interest on debt should not generally exceed 50% of EBIT (Gross farm income *less* FWE)
- Allow for some things to go wrong - they always do!
 - ❖ higher interest rates
 - ❖ a higher dollar
 - ❖ lower commodity prices

Is it profitable?

- The numbers can be made to do what we want! Each situation is different

- The key to profitability is:
 - ❖ Typical returns range between 10% & 20% return on capital, say 15%

 - ❖ utilising water to increase production, not insurance against loss of production in a drought

 - ❖ changing the farm system to make best use of the water

 - ❖ solving other limiting factors to production once water ceases to become limiting (pastures, fertiliser, sub-division, management)

- Be careful not to replace capital with higher running costs:
 - ❖ capital depreciates
 - ❖ running costs appreciate

In the long term, capital is almost always cheaper.

Typical scheme cost vs underground supply - 150 ha / 80 // sec

Typical running costs (Meridian 3 yr fixed rate, Ashburton)

Pump size	Cost	Cost / ha
Pressurised scheme	0	0
75 (surface unpress)	20,000	134
150	40,000	266
210	56,000	372
285	76,000	504

Total running costs are comprised of:

- scheme overheads (R & M, admin, etc)
- interest on capital of:
 - ❖ off farm works (scheme)
 - ❖ on farm works
 - ❖ land
- electricity
- on farm R & M
- labour
- depreciation of plant

Comparison of possible cost structures

Comparison of running costs

Take home messages

- Irrigation developments have a huge impact on local economies
- The community benefits more in the short term
- Irrigation is a very expensive insurance policy - you must be prepared to alter your farm system to generate the best return
- The system, and its profitability, is only as good as the most limiting factor to output
- Start with a clean sheet of paper. Try to build the farm around the irrigator

- Do it once, do it right!
- Incorporate environmental enhancement into the scheme design
- The type of land use is not so critical to returns, as what your farm and you will do best
- Think through the labour issues - be careful of trading off capital for increased labour demand
- Don't start unless you are 110% committed:
 - ❖ it's not cheap
 - ❖ it' not easy
 - ❖ it's a lot of work

BUT
done well,
it is one of the most
rewarding investments
a rural business can make,
both financially and personally