

PIRSA

Innovative water harvest and storage solutions

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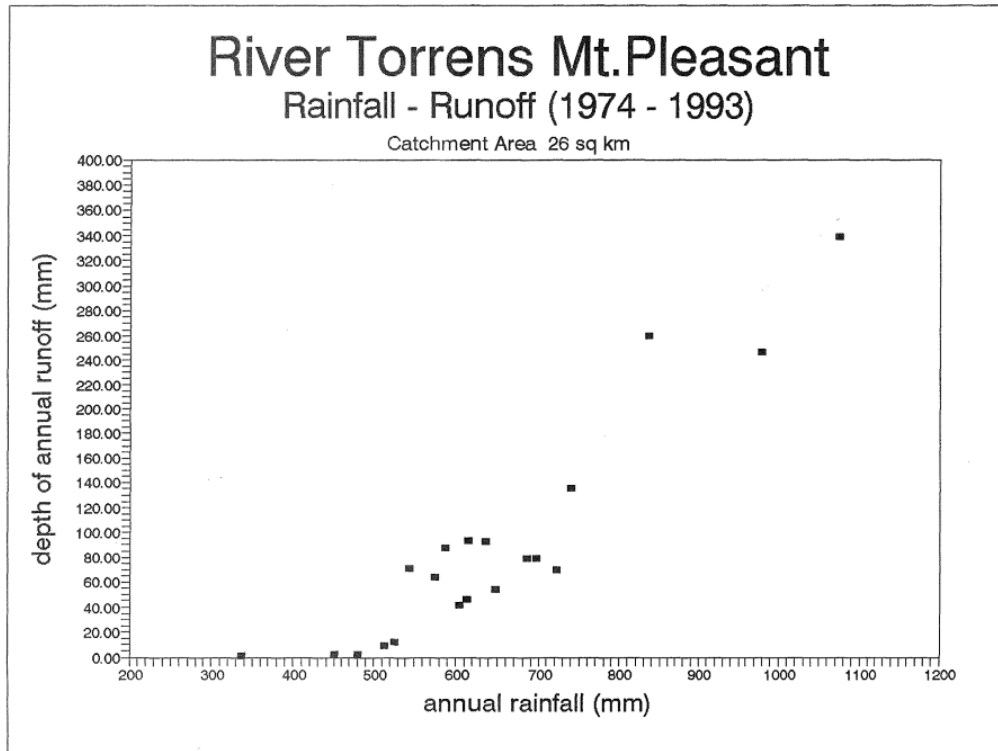


Experience

- Eastern Eyre Peninsula/ Cleve Hills late 1980's- most farms were dependent on surface catchment of some sort- included scrapes, catchments, soaks, PIRSA ran a dam site evaluation service
- Parawa landcare project looking at improved stock water options during the 2007 drought

Natural Catchment Runoff

Torrens River at Mt Pleasant- little runoff unless rainfall >500mm. (SD Moore)



How much water do you need?

- 2.5 kl/DSE/yr
- 1000 DSE = 2500kl = 2.5ML/yr
- If dams – 40% evaporation = 4 ML/yr,
if 2 years = 8 ML
- If bore= 2.5ML depending on quality
issues

- Household use with garden/lawn
=500l/yr/m² = 1 ML for 0.2 ha garden

Opportunities for Improving stock water supplies

1. Improve the catchment- runoff
2. Improve the storage
3. Improve the quality
4. Improve the distribution

Catchments

- Scrapes- can be difficult on erodible soils
- Roaded catchments- more stable
- Plastic sheeted catchments – more expensive



Scrapes/Graded Catchments



Mangalo north Cleve

- Graded down to clay, design low grade reduce erosion risk
- Some cover provides some protection
- Can get around 20% run-off, higher in wetter years or significant events



Kangaroo Island

Roaded Catchments



Nuri Research Centre 1990s

- Topsoil pushed into middle
- Verran eg established in dune swale area on clay



Sims Farm 1970s

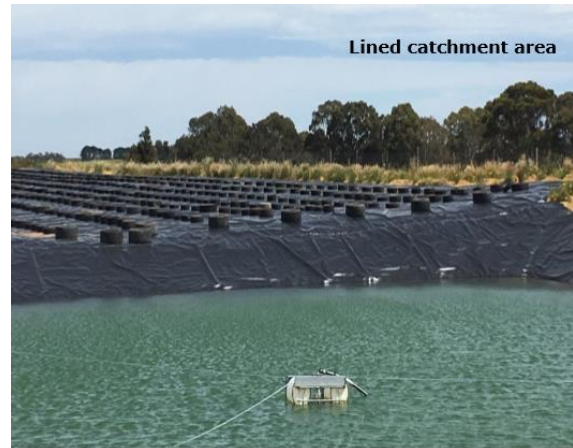


Verran EEP, 325 mm rainfall

Plastic Sheeted Catchments



Kelly Eastern Eyre Pen



Coorong

- Runoff around 98%
- In the ideal situation new dam constructed and lined high on the property
- Hanneman's example including new dam, catchment 0.4ha, liner, dam cover, fencing, approx. \$70k- reticulated and replaced 40 dams

Approximate Cost

Catchment Type/ size	Rainfall-500 mm Runoff ML	Rough Cost of catchment	Comment
Roaded – 2 ha @25% runoff	2.5 ML	6 day's grader= \$9k + design	Will run more in wet years
Scrape-2.5 ha @20% runoff	2.5 ML	5 day's grader= \$7.5k + design	Will run more in wet years
Plastic- 0.5ha @95%runoff	2.4 ML	\$30k for liner	May need to add new dam cost

Other natural catchments?

- Runoff from roads- can supply significant run-off in some situations
- Soaks/ springs- need to be careful don't over dig

Dam storage- Options for Improving

Evaporation loss in stock dams- can be upto 50% of the capacity in one year

Covers cost \$10k for 1-2 ML ha dam (Hanneman)

Coke bottles used on effluent dam- messy!



Other Storage Options

- Tanks- can be used for quality water supplies, no evaporation, sheds can provide significant amounts of good quality supply
- In ground storage – used in the SE around Bordertown where run-off is directed into sinkholes and re-used over Summer
- Aquifer storage for horticulture and parks becoming more common around Adelaide

Water Quality- Options for Improving

Two mechanisms

- Distillation- get pure water and salt
- Membrane processes- salty effluent 10-20%

Generally reverse osmosis is considered the cheapest options although for smaller water requirement such as stock distillation systems maybe appropriate.

Costs range from \$1/kl to \$4/kl for reverse osmosis methods

Water blending options? various blenders available

Water Distribution on Farms

Key Points

Energy used getting to water

- sheep will generally utilise 10-20% of their energy for grazing under conditions where good quality forage and water is available
- where sheep must walk considerable distances (5km or more) for preferred grazing and water will have an additional requirement of 30-40% for energy
- Better stock performance on good quality water has been measured

One good dam with multi years storage and distribution vs many dams???

Where to?

- There are a range of options for improving water catchments, storage, quality and distribution
- Economic and site considerations need to be examined to determine best options
- If drier conditions prevail and mains water continues to rise in price these will become more favourable
- BIGG has submitted a landcare application to examine water supply options

References

- Hanneman's Cleve Hills case study- plastic catchment, liner, cover, new dam, reticulation system
- Coorong and Districts case study- plastic sheeted catchments
- Kangaroo Island- graded catchments
- Older Steve Moore documents
- FABTECH suppliers