CASE STUDY

WHEATON – GRADED CATCHMENT AND WATER MANAGEMENT

"We feel now that we have enough water to survive two years of drought".

FARM DETAILS:

- Size - (arable and scrub): 1292 Ha in total 720 Ha arable
- Rainfall: 480 mm
- Soil type: terra rosa, heavy cracking clay, sandy loam over clay and deep sandy loam
- Livestock / crop mix: 2600 cross bred self-replacing flock.
- Pasture mix: lucerne, chicory, fescue, phalaris medic clover mix. Wet country consists of tall wheat grass, phalaris and medic

BACKGROUND

The Wheaton family have been farming in MacGillivray for over 100 years – so they know a thing or two about dry seasons! Not only is the Hundred of MacGillivray amongst the driest on KI, but saline ground water also prevents most landholders from digging deep dams.

After a few dry spells, the Wheaton family came close to running out of stock water. This motivated them to think seriously about longer term water management options. When Derek returned home to the farm in 2016, he began to focus on the water quality of the farm as well as looking to drought proof the operation. A visit to Peter and Katrina Lovering's graded catchment gave them the solution they were looking for.

Derek received funding from the Kangaroo Island Landscape Board to assist with the works and establish a water security demonstration site.

THE OPTIONS

1. Around 2017, **Derek looked at desalination options**. With plenty of salty water on the property, there was no lack of supply. But several issues arose:
    - what to do with the hyper saline wastewater.
    - the cost to purchase a desalinator plus ongoing running costs, including a power source.
    - the saline water supply was near the lowest point of the farm, meaning all desalinated water would need to be pumped (an extra cost) to all other reaches of the farm.
2. **To buy in water**. The nearest standpipe is approximately 20 km away, again a considerable cost. Negotiations were undertaken with SA Water to access the mains desalinated water, but the system is currently over allocated.
3. **To dig more or deepen existing dams**. The saline underground water in this area means there is a significant risk of intercepting this layer if deeper dams are dug. Shallow dams tend to only hold just over a year's supply of water, which is not a good drought proofing farm exercise!
4. **To access underground water via an existing well**. Whilst plentiful and always available, no matter how little rain fell, the well was becoming increasing saline.

THE SOLUTION

All the options above were clearly unviable. The option to destock in dry times was also unviable for purely economic reasons. Having heard about the graded catchments that had been constructed on the Island after the dry run of 2005-07, the Wheaton family's solution was to construct a graded catchment.

Graded catchments are designed to reduce rainfall soaking into the soil by promoting rapid run-off without causing erosion. By removing the topsoil and compacting the clay subsoil, the rain can more easily runoff into the dam. Work on KI has shown that graded catchments can increase runoff by over 50% compared to 10 -15% for pastured areas.

Graded catchment showing water in the drainage lines.

WHAT WAS DONE?

1. **Site selection**. The site was selected for several reasons:
   - it's the highest point of the property, meaning water can be reticulated across the whole farm via gravity feed from two tanks to all farm troughs.
   - the site was appropriate for the construction of graded catchments and dams i.e. suitable soil and slope.
2. **Design** – the design was discussed and developed with Ron Watkins, who resides in Western Australia, and is a supporter of Keyline Farming Techniques designed by PA Yeomans. Ron provided the contour design with dam placement/construction already in existence. *Refer to the Graded Catchment Fact Sheet for more information*.
3. **Construction** – the site was surveyed to enable a design of interconnected drains and graded catchments to fill three dams. Three dams were constructed as the underlying saline ground water did not allow for a single (deeper) large dam to be built. Drainage lines were designed with a <1% fall. The topsoil was then stripped off and stockpiled by the existing dams (giving Derek the option to on-sell the soil if he chooses), the runs were then cut down to the clay layer and the surface compacted.
4. **Results** – Within the first-year post construction, the dams in the graded catchment were filled to over 90% capacity. The water quality was excellent at 300 ppm (a massive improvement on the 10,000 ppm they had been accessing from the well).

An additional benefit of the improved water quality was better stock health. When stock were watering from the well or small dams, they were prone to significant pink eye problems due to the dust in the summer months. With the previous water quality, the sheep used to congregate around the water points, as their thirst was not satisfied with the salty water. Now the stock travel in single file to have a drink and leave.