

Managing Water in Dry Times

During low rainfall periods, a considered strategy is required to make the best use of available water resources. Rather than make decisions on the fly, a pre-determined plan can be put in place to ensure the most efficient use of the available water is achieved. The plan should include measuring available water and water use, and short and long term strategies.

The first step is to calculate how much water is available. For surface water storages, this is a relatively simple process, and is explained in a previous article on measuring dams. Underground water supplies are more complicated to measure, as the available water may decline as the dry event proceeds. The yield of bores can be calculated by accurate and regular monitoring, and this in turn can be used to determine appropriate strategies in much the same way as for surface water storages.

The second part of the equation is to calculate daily water use. If a water meter is installed this is an easy piece of information to obtain, but can also be calculated by measuring the flow rate from emitters, and multiplying this by the number of emitters and run times for each area. Assessments of water used in non-irrigation activities should also be made. These measurements give the amount of water pumped, but for recycling systems, the recycling benefit needs to also be calculated. Until an accurate figure of recycling benefit can be obtained, an average of between 60 - 80% of water applied can be considered as being recycled. Once data on water use from the water storage and water pumped has been collected for a period, a more accurate assessment of recycling benefit would then be possible. Evaporation from water surfaces also has to be included in the calculations, with the relative importance of the effect depending on the surface area of the dam and how much water is being pumped.

Once the above data has been obtained, short term strategies can then be determined based on the amount of water remaining, and can be set up as a simple table as in the example below.

% Water Available	Strategies to Implement
50	<ul style="list-style-type: none"> <input type="checkbox"/> Stop non-crop garden irrigation. <input type="checkbox"/> Check system efficiency and repair leaks. <input type="checkbox"/> Check drainage collection efficiency. <input type="checkbox"/> Monitor water quality weekly, and adjust water treatment and fertigation levels accordingly.
40	<ul style="list-style-type: none"> <input type="checkbox"/> Reduce mother stock irrigation. <input type="checkbox"/> Consolidate crop growing areas. <input type="checkbox"/> Monitor irrigation scheduling closely. <input type="checkbox"/> Minimise non-essential water use.
30	<ul style="list-style-type: none"> <input type="checkbox"/> Stop mother stock irrigation. <input type="checkbox"/> Monitor dam/bore pump performance daily – pump efficiency will decline and may lead to pump damage at low water levels due to the height water has to be lifted. <input type="checkbox"/> Rationalise crops. <input type="checkbox"/> Consolidate water supplies to reduce evaporation. <input type="checkbox"/> Extend water supplies by blending with poorer quality water.
20	<ul style="list-style-type: none"> <input type="checkbox"/> Stop all non essential water use. <input type="checkbox"/> Ensure scheduling, drainage collection, system efficiency and leaks are at kept at peak efficiency.

Long term strategies then need to be considered, particularly if available water levels regularly fall below 50%. Strategies such as implementing or improving recycling water collection, improving irrigation layout efficiency, increasing storage capacity, investigating alternative water sources, and reducing evaporation from water storages can be considered. Data collected on water storage and use can then be used to determine the most appropriate methods to be implemented.

Lex McMullin

Farm Management System Officer

Mob: 0400 005 236 - Email: fmso3@ngiq.asn.au