Land & Water fact sheet

Water efficiency

What is it?

Water efficiency looks at how we can use the water we have to grow and produce more, by delivering the water to the plants in the most efficient way possible. This can only be achieved through an understanding of the physical resource constraints (i.e. the total volume available, rate of extraction and other access limitations) and the capability of your on-farm infrastructure to adequately store, deliver and apply water around your farm in response to your crop requirements.

There are several water use indices that are used to measure the production return per unit of irrigation input.

e.g. Irrigation WUI = yield / water applied = kg/mm = t/ML

An important factor in effective irrigation is the capacity of the system to supply the total seasonal crop water use. This requires knowledge of the expected crop water use for the whole season and knowledge of the irrigation supply, storage, distribution and application system capacity to apply the required water.

How does it help me?

Becoming more water efficient whilst maintaining and/or improving yield will provide greater economic return per hectare through:

- reduced off farm impacts - deep drainage, leaching of nutrients and sediment run off
- reduced pumping costs - decrease in the amount of time a pumping unit needs to operate
- reduced fertiliser costs - applied through fertigation will ensure plants receive required amount.
- increased plant health - decrease in water logging and dry spots will reduce stress and susceptibility
- reduced labour costs - reduced picking over the same paddocks (e.g. brassica) due to product uniformity and shortened growing period

Monitoring and scheduling

Irrigation scheduling is the practice of matching irrigation water supply to crop demand. Failure to schedule can lead to direct impacts on crop productivity due to over or under watering.

Appropriate irrigation scheduling, based on timely measurements or estimations of soil moisture content and crop water needs, is one of the most important requirements for irrigation management. Scheduling involves the identification of both the time to irrigate and the appropriate volume of water to apply. A number of devices, techniques and computer aides are available to assist producers in determining when water is needed and how much is required.

Regardless of the method of irrigation used, some on-site calibration and the location of the sensor in an area of the field which is representative of both the water application and the crop extraction is essential. Many producers find that irrigation services offered by

the knowledge plant

Water efficiency continued

crop consultants are the most cost-effective method of scheduling and managing their water.

Irrigation scheduling uses a selected water management strategy to prevent the under or over-application of water while maximising net return. Experienced producers know how long it takes them to get water around their farm and are proficient in avoiding crop stress during periods of average rainfall. The difficulty lies in applying only enough water to fill the effective root zone without unnecessary deep percolation or runoff.

Accurate accounting of crop water use ensures optimal crop production quality and provides producers with the knowledge of how much water should be applied at any one irrigation event.

Crop benchmarking

Benchmarking is an effective way to identify practices and opportunities to improve irrigation management. To benchmark irrigation practices, you simply need to measure how much irrigation has gone on to the crop and know the total or marketable crop yield.

Comparisons between water use and yields can be made either between fields on the same farm or between farms at a regional scale. Large variations between fields and growers are common with the differences observed helping to identify more appropriate management practices.

Summary

Through the work of Water for Profit (WfP), management of your irrigation system is the primary goal to attaining good water efficiency. Understanding the system, sound scheduling techniques, monitoring performance and keeping good production records will ensure a sustainable future.

To find out more about Farm Management Systems contact Growcom on 07 3620 3863 or visit www.growcom.com.au/knowledgeplant

References

Water for Profit: Issues in Irrigation Management for the Queensland Horticultural Industry – Explanatory Notes, Growcom

http://www.growcom.com.au/land&water/wfpfactsheets.html#General0

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