Water requirements of annual crops

How much water do you need?

The amount of water that you need will depend on the crop you are growing, on whether you are farming in the hotter and dryer areas of the State rather than the cooler wetter districts, and will vary from season to season. The time of planting is also an important factor.

Table 1 provides some guidance for planning purposes on the total volume of irrigation water required over a growing season for different crops.

Values indicate water requirements in millimetres (mm), and in mega-litres (ML) per hectare. One mega-litre (1 million litres) equals 100 mm applied over one hectare.

Table 1. Approximate seasonal water requirements for annual crops.

Crop	Irrigation depth applied mm	Irrigation quantity ML/ha
Potatoes	300-400	3.5–4.5
Poppies	150-250	1.5–2.5
Peas	100-200	1.0-2.0
Green Beans	200	2
Pyrethrum	100-150	1-1.5
Buckwheat	150	1.5
Carrots	350	3.5
Onions	350-400	3.5 –4.0
Broccoli	200-250	2-2.5
Squash	150-200	1.5-2.0
Lucerne	350-450	3.5-4.5
Pasture	350-600	3.5-6.0

In practical terms, intensively irrigated crops, such as potatoes, carrots, onions and poppies require an irrigation volume approximately equal to evaporation and plant transpiration losses, which are usually referred to as evapotranspiration (ET).

Table 3 provides long term average evaporation values for 5 different locations in Tasmania. Actual values can vary considerably (double or half) on any particular day due to local variations in temperature, cloud cover, and wind run.

Crop irrigation requirement can be calculated from evaporation multiplied by a crop factor but also taking into account the amount of crop cover over the soil surface. Total ET for a season equates to ET/week multiplied by the number of weeks the crop is at full leaf cover.

For example, the total irrigation requirement for potatoes (14 weeks full canopy) at 28 mm ET per week (4 mm per day) = 4 ML/ha.

Travelling gun irrigators typically meet this requirement through one high volume 35–45 mm irrigation on a 7 to 10 day interval. Centre pivot irrigators often apply lower volumes more frequently.

Table 3. Average daily evaporation (mm/day) for each month in Tasmania.
(source: http://www.bom.gov.au/climate/data/)

	Grove	Hobart	Ross	Scottsdale	Elliott
Jan	4.9	6.2	6.8	4.8	5.4
Feb	4.4	5.4	5.8	4.3	4.9
Mar	3	4.2	4.4	3.2	3.6
Apr	1.9	2.8	2.5	1.9	2.3
May	1.2	1.9	1.5	1.2	1.4
Jun	0.8	1.3	1.1	0.9	1.2
Jul	0.9	1.4	1.1	1	1.2
Aug	1.3	2	1.8	1.4	1.6
Sep	2.1	3	2.6	2	2.2
Oct	3	4.1	3.6	2.9	3.3
Nov	3.8	4.9	4.9	3.6	4.2
Dec	4.5	5.9	6.1	4.4	4.9

How often to irrigate

The water used on a daily basis, as calculated from the values in Table 3, and the amount of Readily Available Water in the effective root zone (see Water Available in Soil factsheet) determines the irrigation interval.

- The lower the RAW value the more frequent irrigation needs to be.
- The higher the daily evapotranspiration the more frequent irrigation needs to be.

Monitoring of soil moisture will allow for greater certainty in determining when to irrigate and also provide information on whether too little (little or no soil wetting) or too much (subsoil wetting and leaching) irrigation has been applied.

Reference

Armstrong D, Giblin M (2001) Assessing your water resources, Wise Watering Irrigation Management Course notes. DPIPWE.

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Last updated February 2012

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