

# Water for Profit

## ESTIMATING CROP WATER USE BASED ON EVAPORATION MEASUREMENTS



WATERFORPROFIT

**Irrigation scheduling is the process of calculating both the timing and volume of irrigation applications required to meet crop yield and quality objectives.**

### Introduction

One method of determining an irrigation schedule relies on measuring meteorological data and using this data to estimate the plant water use. Because this is an indirect method of determining plant water use, it has the potential to lead to either under or over irrigation. To avoid this problem, soil moisture should be measured before and after irrigation and the estimates of plant water use adjusted accordingly.

### Calculating plant water use

Estimates of plant water use under particular weather conditions are commonly obtained using evaporation measurements from a standard Class A pan. These are the Epan measurements commonly reported by weather stations and a range of state agencies.

The level of evaporation (reported in mm) is related to the plant water use. However, the relationship differs between crops and varies as water use changes during the season. Crop factors (Cf) are used to account for this variation with the water use calculated by:

Water use (in mm) = pan evaporation (in mm) x crop factor.

Typical crop factors for a range of crops are provided in table 1. For example, if pan evaporation is 10 mm/day and the tomatoes that you are growing are at a mid-season stage (Cf ~ 0.85), then the plant water use would be = 10 mm x 0.85 = 8.5 mm.

For more details contact Growcom on 07 3620 3844.

**Table 1: Crop factors for selected horticultural crops**

Crop	Crop factors (Kc)		
	Early season	Mid season	Late season
Apples	0.45- 0.95	0.7	
Apricots/peaches	0.5	0.9	0.65
Avocado	0.6 - 0.85	0.75	
Bananas – 1st year	0.5	1.1	1.0
Beans (green)	0.5	1.05	0.9
Broccoli	0.7 - 1.05	0.95	
Carrots	1.05	0.95	
Citrus	0.7	0.65	0.7
Grapes - table	0.3	0.85	0.45
Lettuce	1.00	0.95	
Potato	1.15	0.75	
Pumpkin	1.00	0.8	
Squash, zucchini		0.95	0.75
Tomato	1.15	0.8	

*Disclaimer: This information is provided as a reference tool only. Seek professional advice for irrigation specifics.*

*A Growcom project conducted in collaboration with the Queensland Department of Agriculture, Fisheries and Forestry and the National Centre for Engineering in Agriculture with funding provided by the Queensland Government's Rural Water Use Efficiency Initiative.*



Queensland Government

