Water for Profit

ESTIMATING HOW MUCH WATER SHOULD BE APPLIED

A key component of efficient irrigation management is the determination of how much water should be applied by the irrigation.

Introduction

Where the volume of water to be applied is not directly obtained using soil moisture measurements, it is possible to calculate the volume of water that should be applied from an estimate of the plant water use. In calculating the volume of water applied, the irrigations are assumed to replace 100 per cent of the plant water use.

Calculating the volume of irrigation to be applied

In general, the plant water use (reported in mm) can be converted to a volume per unit area using the equations:

$1 \text{ mm} = 1 \text{ L/m}^2$

or 100 mm = 1 ML/ha.

Hence, a plant water use of 6 mm/day over seven days is equivalent to a volume of 6 x 7 = 42 mm = 42 L/m2 or 0.42 ML/ha.

In this case, if the irrigation discharges water at 5 mm/hour it should be applied for 42 mm ÷ 5 mm/ hour = 8½ hours.

For tree and vine crops, it is common to convert the mm to a volume per plant.

In this case, it is necessary to include the plant area using the row and plant spacings:

Water use (L/plant)

= water use (mm) x planting area (m^2).

For example, if trees along the plant line are 5 m apart, the row spacing is 6 m and daily plant water use is 6 mm, then the water use volume will be 6 mm x 5 m x 6 m = 180 L/plant/day.

In this case, if the trees are irrigated using a 90 L/hour micro-sprinkler, then the irrigation run time will be 180 L/day ÷ 90 L/hr = 2 hours/day.

For drip row crops, it is common to convert the estimated plant water use reported in mm to a volume per unit length of drip tape (or tube).

In this case, it is necessary to include the row spacing:

Water use (L/m) = water use (mm) x row spacing (m).

For example, a row crop with the drip lines spaced 2 m apart and a daily plant water use of 6 mm would need to have = 6 mm x 2 m = 12 L/m of tape/day applied.

If the tape discharges at 2.5 L/m/hr, then the irrigation run time will be = 12 L/m/day ÷ 2.5 L/m/hr = 4.8 hours (or 4 hours and 50 mins).

For more details contact Growcom on 07 3620 3844.

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