

Water for Profit



WATERFORPROFIT

When and for how long should I irrigate?

Row crop micro-irrigation systems (drip) with overlap of water from emitters along the row

You need to know:

- how much water is available in the soil? (requires soil texture, decision on the maximum level of water stress to be applied to the crop and a measure of the crop rooting depth)
- how much water should the crop be using? (requires type of crop, stage of crop growth, measure of climatic conditions including evaporation)

Step 1: you need to calculate the readily available water (RAW) in the crop root zone.

Soil type (texture):	Crop rooting depth:
Crop stress willing to be applied: kPa	Month 1: m
	Month 2: m
	Month 3: m
	Month 4: m

Table 1: effect of soil texture on readily available water content

Soil Texture	Readily Available Water (mm _{water} per m _{soil}) between field capacity and;				
Crop Stress Level	-20 kPa	-40 kPa	-60 kPa	-100 kPa	-200 kPa
Sandy	30	35	35	40	45
Loamy Sand	45	50	55	60	65
Sandy Loam	45	60	65	70	85
Loam	45	65	75	85	105
Sandy Clay Loam	40	60	70	80	100
Clay Loam	30	55	65	80	105
Light Clay	27	46	57	70	90
Medium Clay	24	43	55	65	83
Heavy Clay	21	40	53	60	81

To calculate the RAW in the crop root zone

RAW (in mm/m) x width of wetted area (in m) x crop rooting depth (in m)

Month 1:	mm/m x	m x	m	=	L/m of tape
Month 2:	mm/m x	m x	m	=	L/m of tape
Month 3:	mm/m x	m x	m	=	L/m of tape
Month 4:	mm/m x	m x	m	=	L/m of tap

When and for how long should I irrigate? Continued

Step 3: use the data from steps 1 and 2 to work out the expected period between irrigations for each month

Readily available water (in soil) ÷ crop water use	=	irrigation interval
Month 1: L/m of tape ÷ L/day/m of tape	=	days
Month 2: L/m of tape ÷ L/day/m of tape	=	days
Month 3: L/m of tape ÷ L/day/m of tape	=	days
Month 4: L/m of tape ÷ L/day/m of tape	=	days

Calculating how long to irrigate

You need to know:

- Readily available water content of the area/volume wetted by the irrigation system
- Water application rate or discharge from the irrigation emitter/sprinkler

Step 1: you need to calculate the readily available water (RAW) in the crop root zone.

Use the same steps as for Step 1 in the section calculating when to irrigate above.

Step 2: measure the discharge from your irrigation application nozzle/emitter

Discharge (L/hr) =	volume in container (in litres) ÷ time to fill container (in minutes) x 60 mins/hr
	$\frac{L}{\text{mins}} \times 60 \text{ mins/hr}$
Discharge rate =	L/ emitter /hr
To calculate the discharge per metre of tape:	
Discharge rate (L/m/hr) = discharge rate (L/emitter/hr) ÷ emitter spacing (m)	
	$= \frac{L/\text{emitter/hr}}{m}$
	$= \text{L/hr/m of row}$

Step 3: use the data from steps 1 and 2 to calculate how long to irrigate.

To calculate the period of irrigation			
=	Readily available water (L/m of tape) ÷ discharge (L/hr/m of tape)		
Month 1:	L/m of tape ÷ L/hr/m of tape	=	hrs
Month 2:	L/m of tape ÷ L/hr/m of tape	=	hrs
Month 3:	L/m of tape ÷ L/hr/m of tape	=	hrs
Month 4:	L/m of tape ÷ L/hr/m of tape	=	hrs

For more details contact the Growcom members access line on 1800 654 222

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



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