Soil Available Water and Irrigation Interval

Available and readily available water in the root zone from field capacity and wilting point, the irrigation interval at a crop water use, and gross depth.

Input parameters

Unit system: SI

Parameter	Value	Unit
Volumetric water content at field capacity	32.000	%
Volumetric water content at wilting point	16.000	%
Root depth	0.60000	m
Allowed depletion (share of available water)	50.000	%
Crop water use (mm per day)	5.0000	
Application efficiency	75.000	%

Calculated results

Parameter	Value	Unit
Total available water (mm)	96.000	
Readily available water (mm)	48.000	
Irrigation interval (days)	9.6000	
Gross depth per irrigation (mm)	64.000	

Notes for this case

• Plants can draw on the water held between field capacity and wilting point over the root depth: TAW = (θ_FC − θ_WP) Z_r. Only part of it, the readily available water, can be used before growth suffers (p about 0.3–0.6 by crop). Irrigating when RAW has been used up gives the interval RAW/ET_c and the net depth RAW, which the application efficiency turns into the gross depth.

Formula and method

$$TAW = (\theta_{FC} - \theta_{WP}) Z_r, \quad RAW = p\,TAW, \quad i = \frac{RAW}{ET_c}, \quad d_g = \frac{RAW}{\eta}$$

Variables

θ_{FC}	Volumetric water content at field capacity	-
θ_{WP}	Volumetric water content at wilting point	-
Z_r	Root depth	m
p	Allowed depletion (share of available water)	-
ET_c	Crop water use (mm per day)	-
η	Application efficiency	-
TAW	Total available water (mm)	-
RAW	Readily available water (mm)	-
i	Irrigation interval (days)	-
d_g	Gross depth per irrigation (mm)	-

Method and standards

Irrigation interval.

Assumptions and limits

- Uniform soil; no rain during the interval.

Report details

Report reference	FCC-RTPT-NFJC (the same inputs always give the same reference)
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Calculator	Soil Available Water and Irrigation Interval
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Release checks	3 reference cases of this calculator, computed independently, are checked on every release

Results are for engineering estimation. Verify critical designs against the referenced standards and your own data.

This calculator online

https://calc.firecad.com/civil/irrigation-farm/soil-moisture-irrigation-interval

Open this case on calc.firecad.com →

Reopens the calculator with the inputs of this report.