

Irrigation Water Calculator - to determine the volume of irrigation water required for a specific land use.

Compiled by Aqualinc Research Ltd.

Modern water allocation practice is to allocate units of irrigation water on a volumetric basis rather than a rate per hectare as in the past. This allows the individual irrigator to choose how much water they will require to suit their individual requirements. This choice will depend on the nature of the volumetric entitlement and the seasonal depth of water that the farm needs to apply. The volumetric entitlement will be described both as a volume and a flow rate that should be converted to mm per hectare. The seasonal depth will depend on the application efficiency, land use (farm) type and the soil type.

The calculation of units of water is a stepped process as follows;

- Step 1** Choose your farm type.
- Step 2** Choose your soil type.
- Step 3** Select the seasonal depth of water. (Go to table 3)
- Step 4** Specify irrigated area.
- Step 5** Calculate units of water required. (See formula below)

$$\text{Units of water} = \frac{\text{Area (hectares)} \times \text{Seasonal depth (mm)}}{\text{Volumetric entitlement (mm / ha)}}$$

The following tables show the information required for the first three steps.

Table 1: Farm type

Farm type	Description
Pasture	Dairy farming, dairy support, beef and lamb finishing, deer etc
Mixed cropping	Mix of crops and pastoral enterprises
Intensive arable/ vegetable	Crops grown intensively, usually without livestock

Table 2: Soil type

Soil type	Water holding capacity (based on 600mm depth)	Example of Soil Description
Light	Less than 80 mm	Sandy or stony silt loams, eg Lismore, stony Eyre
Medium	80-120 mm	Better Lismores, Eyres, shallow Templeton or Waimakariri
Heavy	Greater than 120 mm	Good deep Templeton, Hororata, Temuka, Waimakariri

Table 3: Seasonal depth of water required based on 80% application efficiency

	Typical seasonal depths of water required (mm)		
	Pasture	Mixed	Arable
Soil type			
Light	750	625	600
Medium	675	550	450
Heavy	600	500	400

An example calculation.

In this example one unit of water = 1000 cubic metres which is sufficient to apply 100⁽¹⁾ mm (4”) to 1 hectare of land. Water will be supplied at a flow rate up to 0.6 litres per second per hectare.

Example Calculation of Approximate Units to Purchase

Step No	Instruction	Example
Step 1	Choose your farm type	Pasture
Step 2	Choose your soil type	Medium
Step 3	Go to table 3 and select the seasonal depth of water	675 ⁽²⁾ mm
Step 4	Specify irrigated area	250 ⁽³⁾ hectares
Step 5	Calculate units of water required. See formula below.	1687.5 ⁽⁴⁾ units

$$\frac{250^{(3)} \times 675^{(2)}}{100^{(1)}} = 1687.5^{(4)} \text{ Units of water}$$

Disclaimer: The above information should only be used as a guideline to estimate the number of units required. Further advice should be obtained from farm advisors or irrigation experts. No liability is accepted by the Ritso Society or any employee or sub-consultant of the Ritso Society with respect to its use by any person.