



## Irrigation Requirement Calculator for Crops

### User Manual

#### About the calculator

- ✓ The calculator is a simple tool to estimate the water quantity and irrigation timing for different crops
- ✓ The calculator relay on live weather data to estimate irrigation requirements depending on automatic weather stations in different locations
- ✓ Its advised to revisit the calculator weekly to reschedule the irrigation timing in your farm
- ✓ The calculator is generally relaying on FAO recommended equations and crop factors to calculate water requirements for drip irrigated crops
- ✓ The calculator provides the quantity of water needed, but irrigation frequency depends on soil type and root zone depth. In case of light sandy soils its recommended to irrigate more frequent, and if clay and silt ratio are higher less frequent irrigation events is advised.
- ✓ Irrigation system efficiency and drippers discharge should be checked and measured in the farm. To set the irrigation schedule properly.

#### Calculator use instruction

1. First choose the crop type from the list
2. Then choose the actual crop planting date in the field, or the date of last cut in case of forage crop. In case of fruit trees, no need to enter the planting date, because in fruit trees the water use is depend on the shading area percentage inside the field. In case of entering planting date for crops more that its economic life spans it will be out of the calculator range
3. Choose Nearest weather station from the list to your farm
4. Then enter the number of days after the last irrigation event to compensate this period, depending on actual weather conditions. But it should be considered that every soil type has a certain water holding capacity, therefore in light sandy soil more frequent irrigation events in advised



5. Choose the water salts leaching quantity needed to avoid salt accumulation in the soil. Its recommended to enter 15% factor for low salinity water ( and 30% for medium saline water and 40% for highly saline water. But care should be always taken when using sailing water because more irrigation more salts are added to the soil in general.
6. Then enter the farm irrigation system efficiency, this value is related to the water distribution efficiency to the plants and its ranges between 98% for proper designed and managed system to 50% for poor designed irrigation system. And its recommended to enter at least 85% irrigation system efficiency which is easy to be achieved in the farm. And it should be noted that low irrigation system efficiency will waste large amount of water, you can consult an irrigation specialist to advice how to improve irrigation system efficiency in your farm.
7. Choose planting method or practice, either open field or net house or plastic greenhouse or hydroponic plastic green house. Because the water use will vary depending on weather condition, and in the calculator the protected agriculture consumption has been generally estimated, but it can widely varies depending on greenhouse design and cooling system efficiency.
8. Also need to know the percent of shading for the crop planted especially the trees to exclude dry areas. And to make it simple we divide shaded area by tree planting area, for example if planting area is 49 m<sup>2</sup> and shading area is 25 m<sup>2</sup> then the shading area will be 50%. But if the tree irrigation basin area is more than the shading area we should consider the basin area instead. In case of vegetables we enter shading area for the crop when its in maximum growth only. and enter 100% for climbing crops.
9. Enter spacing between drippers in Centimeters regardless plant spacing. And in case of trees enter spacing between trees.
10. Enter spacing between irrigation lines in cm, in case of more lines per bid the average spacing between line should be entered, for example if spacing between bids is 100 cm and bid width was 40 cm, and there is two irrigation lines per bid, then the space between lines is 140 cm divided by 2 which equal 70cm. in case of trees the spacing between trees should be entered only.



11. Enter dripper flow (liter per hour). In case of trees calculate total flow for drippers or bubbles per one tree. For example, if there is 12 drippers per tree and 25 liter/hr flow then 300 liter/hr should be entered.
12. As per entered data crop water requirement will be calculated in m3 per dunom for the chosen period of time. To calculated amount of irrigation per tree just divide water requirement per dunom by total number of trees per dunom in your farm.
13. And as per data entered for irrigation system and drippers, irrigation time per minutes will be calculated.