

How to Establish Relative Water Content (RWC)

The TDR-100 or TDR-300 Field Scout Moisture Meters measure either the volumetric water content (VWC) or relative water content (RWC) of the soil.



VWC is how much water is in a given volume of soil. Depending on the soil type, some of this water will be available to the plant and some will be locked into the soil particles. A pdf labelled “Soil Postcard” indicates the VWC for various classes of soil types.

VWC varies depending on soil type. To overcome this variability, RWC normalises the data so wilting point is 0% RWC and a saturated soil is 100% RWC. Once the values of 0 and 100% RWC have been determined, the type of soil that is being measured is no longer of relevance.

The steps below outline how to determine 0 and 100% RWC for your particular soil type.

Step 1

Choose a few experimental plants, say 3 to 5. Irrigate the soil as normal practice so the soil is saturated or very wet. Measure the soil with the TDR-100 or TDR-300 in VWC mode and note the VWC value. It is a good idea to take about 5 measurements around the plant and average the data.

Step 2

Do not irrigate the experimental plants and try and prevent rainfall as much as possible. The idea is to dry the soil and stress the plants so they show obvious signs of wilting. You do not have to kill the plants but you should reach a point where it is beyond obvious that the plant is experiencing extreme moisture, or drought, stress.

At this point, measure the soil with the TDR-100 or TDR-300 and note the VWC value. It is a good idea to take about 5 measurements around the plant and then average your data.

Step 3

The values you measured in Step 1 will be your 100% RWC value. The values you measured in Step 2 will be your 0% RWC values. With the software, you can then enter these values into your TDR-100 or -300 unit. Subsequently, you can manage or check your irrigation by quickly measuring RWC. In practice, it is best not to let RWC fall below a value of 80% or 75%. But this value may vary depending on your situation and your plant species.

Notes

The above steps should be repeated for different species and for different soil types. The VWC value will vary significantly with different soil type. For example, a clay loam versus a sandy loam will have different VWC values and this will affect the outcome of your RWC value.