

Evaluation of Water Analysis: Is its Quality Suitable for Irrigation?

In the light of decreasing availability of water for irrigation, producers are compelled to investigate the possibility of using water sources previously not considered, i.e., boreholes or wastewater. The quality of these sources often raises concern, making producers unsure whether they can rely on it for long-term crop production or new developments.



In this document the most common factors that determine whether water is suitable for irrigation, as well as possible mitigation options, are discussed.

Water salinity

The first quality parameter that must be considered is total dissolved solids (TDS), which is a measure of the total quantity of various inorganic salts dissolved in water.

The TDS is assessed by measuring the electrical conductivity (EC) of the water. The principle of electrical conductivity measurement is based on the fact that salts in water increases the rate at which electricity is conducted in the water – the higher the salt content, the higher the conductance.

The TDS is typically calculated mathematically by laboratories from the EC by using a factor that will differ according to the unit in which the EC is expressed in. The applicable factors are provided in the table below, with the TDS being expressed as milligrams per liter (mg/L), which is equal to parts per million (ppm).

Unit		Factor for conversion	
		From mS/cm	To TDS
milliSiemens per cm	mS/cm	Reference unit	640
desiSiemens per meter	dS/m	mS/cm x 1	640
microSiemens per cm	µS/cm	mS/cm x 1000	0.64
milliSiemens per meter	mS/m	x 100	6.4

Interpretation of the total salt content of water is done, using a scale of EC values – the higher the EC, the less suitable the water becomes for crop production. Different EC ranges are used to classify the water's quality – the different classes that are internationally used as an indication of the water's suitability for crop production is provided in the table below. The EC, however, does not indicate the type of salts that are present in the water.