Table 13. Classification of saline irrigation water.

Salinity class	Electrical conductivity (dS/m)	Concentration of dissolved salts (ppm)	Comments
Low	<0.25	<150	Low salinity hazard, generally not a problem
Medium	0.25 - 0.75	150 - 500	Generally not a problem with moderate leaching and the use of salt tolerant plants
High	0.75 - 2.25	500 - 1500	Good drainage is required as is the use of salt tolerant plants and special management such as the use of gypsum and leaching
Very High	>2.25	>1500	Requires good drainage, use of salt tolerant plants, use of soil amendments (such as gypsum) and excess irrigation for leaching

Irrigation water has been classified into four categories based on the salinity hazard (Table 13). These limits, which were determined by the United States Salinity Laboratory, measure total salt concentration of water. Water with EC readings of less than 0.75 dS/m is suitable for irrigation without any problems. Successful use of water with EC values above this level depends upon soils conditions and plant tolerance to salinity.

Blending Water Sources

Water containing excessive salt can be blended with a better quality water to produce an acceptable source. Quality of a poor water source should improve proportionally to the mixing ratio with better quality water. For example, a water source with a EC of 5 dS/m mixed equally with a source with a EC of 1 dS/m should reduce a salinity blend to approximately 3 dS/m. A chemical analysis of the blend should be determined to confirm this.

Salinity Effects on Plants

Saline water can cause stress and injury to plants by several means. Direct salt injury occurs with accumulation of salts in soil as well as ion accumulation within the plant. The more salt in its rootzone, the harder the plant must work to take up water. This direct osmotic stress causes plant dehydration by removing water from the plant into the soil because of a salt concentration gradient. Plant nutrient deficiencies also are indirectly caused by reduction and suppression of nutrient absorption by ion substitution. The most common example of this is the antagonistic effects of sodium and calcium on plant uptake of potassium and magnesium.

Plant resistance to salt stress varies greatly. Some plants avoid salt stress by either excluding salt absorption, extruding excess salts, or diluting absorbed salts. Other plants tolerate salt stress by adjusting their metabolism to withstand direct or indirect injury. Others regulate their internal osmotic potential of tissue fluid to compensate for increases in substrate osmotic potentials. In most cases the mechanism of salt tolerance in plants is a combination of several methods. As a compensatory adaptive mechanism to nutrients and water stress under saline conditions, plants often increase root biomass to enlarge water and nutrient absorbing area. Highest root weights occur at intermediate salt levels but decline at high levels.

Common symptoms of turf grown in saline or sodic soils are spotty stands of grass. A white crust develops in the bare spots when the environment is saline whereas no white crust develops in conjunction with the bare spots in a sodic environment.