

Electrical Conductivity of Soil Extracts

Excessive soluble salts in soils resulting from too heavy an application of rock salt fertilizer or manure, or the use of irrigation water containing excessive amounts of total salts, can cause severe stunting of plants because of injury to the plant root system. "Burning" of plant tissue and drought-like symptoms are the extreme results of salt injury.

Excessive soluble salts in soils can often be moved out of the rooting zone of plants on well-drained soils by one or more thorough leachings. When a high percentage of the total salt concentration is sodium, applications of gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) at the rate of 2,000 to 4,000 pounds per acre or 50 to 100 pounds per 1000 square feet will often aid in leaching out the excessive sodium. Mix gypsum thoroughly with the top 6 - 8" of soil, when possible, before leaching with fresh water.

Interpretations of Electrical Conductivity Values*

Electrical conductivity
(1:2 soil/water ratio)[‡]
mmho/cm

Inorganic Soils	Organic Soils [†]	Relative Level	Plant Response
0 - 0.2	0 - 0.5	Low	Plants may be starved. Check nutrient levels.
0.2 - 0.5	0.5 - 1.0	Medium	Satisfactory range for most plants.
0.5 - 0.8	1.0 - 1.3	High	Slightly higher than desirable. Germinating seeds, seedlings, or new roots may be injured.
Above 1.5	Above 2.0	Excessive	Plants usually dwarfed; crop often fails.

*The total salt concentration in ppm in the soil can be approximated by multiplying the electrical conductivity readings (taken on a 1:2 soil/water ratio) by 1500.

[‡]If results are reported on soil/water ratios other than 1:2, conversions must be made to use the table above. If a 1:3 soil/water ratio is used, multiply conductivity readings by 1.5; for a 1:4 soil/water ratio, multiply by 2, etc.

[†]Plants can tolerate higher soluble salt concentrations in organic soils than in inorganic soils.