

Saline and Sodic Soils

Farmers Blend, Inc. www.Farmers-Blend.com 805-421-6436

Problem:

Soils and water, both high in salts, measured by electro conductivity (Ec), are used in an environment with high evaporation rates. This leaves salts to concentrate on or near the soil surface. With very little organic matter in the soil, sometimes less than 0.5%, and high ambient temperatures, soils quickly become saline or sodic. The dry soils mineralize and become compacted and this leads to erosion of topsoil, increases in harmful anaerobic microorganisms, and beginning of various disorders such as discoloration of plant leaves. Over time soils become phytotoxic.

Conventional Solution:

Gypsum (calcium sulfate) is used to chelate sodium out of soils by replacing sodium with calcium. The amount of gypsum required to amend the upper foot of soil may be 4-8 tons/acre. The material needs to be mixed into the layer of soil that needs the amendment. In order for the application to work, sulfate should not be the dominant ion in the soil. If sulfate levels are low, or other anions such as chloride are proportionally high, then gypsum amendments will be able to dissolve and replace sodium ions. For the application to be successful, it is important that good drainage be present. Drainage can be either natural or tile. Water is also needed to flush the sodium out of the soil once the application is made. Without good drainage, any amendment will not work as needed.

In soils with high sulfate levels and relatively low levels of chloride, calcium chloride will perform an even faster remediation than gypsum at about 85 percent of the gypsum rate. Calcium chloride is more soluble than gypsum, therefore it needs less water to become active.

Our Solution:

Microorganisms excrete organic acids, a type of chelant, which form ionic changes within salts and other contaminants so that they cannot interact with other elements or ions in the same manner. These reactions require carbon. Therefore we use a concentrated humate (Carbon) and combine that with our Ag1000™ microbial solution (Organic Acids).

The Ag1000™ is run through an irrigation system while the humate is banded around trees after an irrigation. Tillage is not required the humate will naturally penetrate the soil with the next irrigation. The results are not only accelerated chelation of salts, but increase in polysaccharides, increase in beneficial fungi growth, and overall increased soil tilth. This is all done with a relatively low input and labor cost.

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Below are our program suggestions for saline and sodic soil remediation:

Aggressive Program (1-year program):

- 100 gallons of Ag1000™ to the soil per acre in irrigation water.
- 200lbs of granular humate per acre to the soil after irrigation.

Moderate Program (2-year program Each Year):

- 60 gallons of Ag1000™ to the soil per acre in irrigation water.
- 100lbs of granular humate per acre to the soil after irrigation.

Annual Program:

- 40 gallons Ag1000™ per acre per year added in irrigation water.
- ½ gallon per acre Ag1000™ in each foliar feed, added to other nutrients in Farmers Blend program.

Additionally, we recommend incorporation of all chipped pruning material in the soils on a 4-year rotation to add additional carbon to the soil.

- Prune, chip or shred pruning in rows.
- Mix 20-30 gallons Ag1000™, 20-30 gallons molasses, 1-2 gallons Humate (25% or higher product), and 50 gallons water per acre.
- Spray solution on shred or chips and lightly incorporate in to 2-3 inches.
- Repeat this program on a 4-year rotation.