



# Natural Growing Through Biology

## A BIOLOGICAL FARM MANAGEMENT SYSTEM (BFMS®) GUIDE FOR: Soil Salinity and Drought

Excess soil salinity and drought often go hand in hand. When rain and surface irrigation water become scarce, growers must sometimes resort to using water from less optimal sources, which tend to be higher in mineral salts. With consistent use of high saline water, salt builds up in the soil, especially in soils with poor drainage due to compaction or high water tables.

Salt can degrade the soil's structure. Healthy soil clumps, providing pore spaces that hold water, much like a sponge. A high concentration of salt causes deflocculation (breaks down the clumps) and reduces the soil's capacity to store water. When the deflocculated soil becomes wet and then dries out it forms a hard crust, inhibiting soil respiration and contributing further to its downward spiral. According to Dr. Jerry Hatfield, Laboratory Director at USDA Agricultural Research Service, as little as a 1/32-inch crust will inhibit soil respiration<sup>1</sup>.

Plant roots absorb soil water through osmosis, where water flows from a lower salt concentration in the soil to a higher salt concentration in the plant root cells. When the soil's salt concentration is higher than the plant root's cells, water uptake becomes restricted, causing the plant to dehydrate even in the presence of available water. Excessive salt may also hinder the absorption of other essential plant nutrients like calcium and magnesium, causing nutrient imbalance.

**Spectrum DS™** contains salt-remediating microbes to reduce salt levels in the soil, and plant growth promoting bacteria to support healthy plant growth, make nutrients available to the plant, and rebuild soil structure to increase permeability and water holding capacity.

Example of Typical Protocol Recommendation for High Salt Soils, to be used in conjunction with your fertility program:

Type of Soil	Time of Treatment	Product to Apply	Application Rate
Conventional High Salt Soil	Spring	Spectrum DS Pepzyme G Soluble Humate Powder	50 grams/acre 12.5 oz/acre 454 grams/acre
	Midsummer and Fall	Spectrum DS Pepzyme G Soluble Humate Powder	25 grams/acre 6 oz/acre 227 grams/acre
Organic High Salt Soil	Spring	Spectrum DS <sup>2</sup> NutraNeed Fish	50 grams/acre 12.5 oz/acre 1 gal/acre
	Midsummer and Fall	Spectrum DS <sup>2</sup> NutraNeed Fish	25 grams/acre 6 oz/acre 1 gal/acre

<sup>1</sup> Hatfield, Jerry. Tainio BioAg Symposium. Spokane, WA. 05 Feb. 2015. Lecture.

<sup>2</sup> Spectrum DS is OMRI listed for use on organic crops. Contact your certifier for approval.