

Resource Concerns

Salts and Chemicals

Soil

Soil Quality Degradation - Salts and Chemicals

Soil Erosion

Concentration of salts leading to salinity and/or sodicity reducing productivity or limiting desired use. The resource concern is also applicable to concentrations of other chemicals impacting productivity or limiting desired use.

Soil Quality Degradation

What is it?

Subsidence

Salinity is a process by which water-soluble salts accumulate in the soil. Saline soils are indicative of inadequate drainage to leach salts from the soil or upward migration of salt from shallow ground water. Sodic soils are high in sodium relative to concentrations of calcium and magnesium. Salinity or sodicity occurs naturally or may result from management practices. Soil formed on parent material high in salts, such as marine deposits, and with inadequate drainage, will be high in salts. Fertilizers, soil amendments (gypsum, lime), and manure may contribute to salinity problems, as well. Applications of saline and/or sodic water without adequate leaching or in the presence of a high water table will increase soil electrical conductivity over time, eventually resulting in saline soil. Soils can also become saline through the process of saline seeps.

Compaction

Organic Matter

Salts and Chemicals

Water

Why is it important?

Air

Since few plants grow well on saline/sodic soils, cropping options on these soils may be limited. Salts in the soil can negatively affect water uptake by plants, and saline soils tend to inhibit germination and plant emergence. Growth patterns in cropped fields can be poor, with spotty stand establishment. Under severe salt stress, herbaceous crops appear bluish-green. Leaf tip burn and die-off of older leaves in cereal grains can result from salinity or related drought stress. Salinization degrades the quality of shallow ground water and surface water resources, such as ponds, sloughs, and dugouts.

Plants

Animals

Energy

What can be done about it?

Reducing the severity and extent of soil salinity is accomplished primarily with recharge and discharge water management. Recharge management is used on areas that contribute excess water to the soil and includes decreasing infiltration of excess saline/sodic water and irrigation to maintain salts at a level below the root zone. Discharge management is used on areas where excess water comes to the soil surface and includes growing salt tolerant crops, reducing deep tillage and eliminating seepage.

Salts and Chemicals at a Glance

Problems / Indicators - White crusting of soil, irregular crop growth, and lack of plant vigor	
Causes	Solutions
<ul style="list-style-type: none"> Naturally occurring in soils with high concentrations of soluble salts, e.g., sodium, calcium, and magnesium sulfates Inadequate drainage to leach salt from the soil Upward migration of salt from shallow ground water Application of saline and/or sodic water 	<ul style="list-style-type: none"> Proper use of irrigation water Salt-tolerant crops Removal of excess water from recharge areas Maintenance of the water table at safe levels Cropping and tillage systems that promote adequate infiltration and permeability Reducing deep tillage