

**NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE STANDARD
SALINITY AND SODIC SOIL MANAGEMENT**

(Ac.)

CODE 610

DEFINITION

Management of land, water, and plants to control and minimize accumulations of salts and/or sodium on the soil surface and in the crop rooting zone.

PURPOSE

To reduce and control harmful salt concentrations in the root zone;

To reduce problems of crusting, permeability, or soil structure on sodium affected soils;

To promote desired plant growth and to utilize excess water in the root zone in non-irrigated saline seep areas and their recharge areas.

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to all land uses where the concentration or toxicity of salt limits the growth of desirable plants or where excess sodium causes crusting and permeability problems. This practice also applies to non-irrigated land where a combination of factors such as topography, soils, geology, precipitation, vegetation, land use and cultural/structural practices can increase the extent and concentration of salts in saline seep areas.

CRITERIA

General Criteria Applicable to All Purposes

All work, including associated practices for management of drainage and runoff, shall comply with federal, state, and local laws and regulations.

Type and rate of application of soil amendments shall be based on the chemistry

of both the soil and irrigation water (where applicable). The chemistry data should consist of electrical conductivity (EC), sodium adsorption ration (SAR), and exchangeable sodium percentage (ESP).

Improve surface and subsurface drainage as needed to reduce localized ponding and or high water tables.

Additional Criteria to Reduce Salt Concentrations in the Root Zone

On irrigated lands, leaching requirements shall be determined as presented in National Engineering Handbook, Part 623, Chapter 2.

On non-irrigated land, reclamation shall utilize vegetative methods, soil amendments, and/or enhanced drainage to effect a reduction in soil salinity. Application of organic matter such as crop residues to reduce soil surface evaporation as well as planting tolerant crops or perennial forage grasses will be the primary reclamation measures used in South Dakota (SD). Additional guidance and management practices are identified in Agronomy Technical Note No. 15.

Additional Criteria to Reduce Problems of Crusting, Permeability, or Soil Structure on Sodium-affected Soils.

Application of organic matter such as crop residues to reduce soil surface evaporation, as well as, planting tolerant vegetation will be the primary reclamation measures used in SD. Application soil amendments containing soluble calcium, or that cause calcium in the soil to become available along with necessary drainage and leaching are not practical alternatives in SD.

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard, contact your Natural Resources Conservation Service [State Office](#), or visit the [electronic Field Office Technical Guide](#).

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Additional Criteria Specific to Saline Seeps and Their Recharge Areas

Planting and/or maintaining adapted high water use vegetation in recharge areas, as well as planting salt tolerant vegetation and applying organic matter on the discharge areas are the primary reclamation measures for saline seeps. Identification of recharge and discharge areas associated with saline seeps, as well as, the necessary reclamation measures and management are identified in Agronomy Technical Note No. 15.

CONSIDERATIONS

Soil salinity levels can be monitored to minimize the effects of salinity on crops and to evaluate management practices.

Tools such as electromagnetic induction (EMI) and salinity probes are appropriate for evaluating and for monitoring soil salinity levels.

The drainage water from this practice may have high levels of salts. Select an outlet or disposal area that will minimize the effects of this saline water.

Removal of salts from the root zone by leaching operations may increase contamination of water tables. Avoid excessive leaching and schedule leaching operations during seasons when potential contaminants in the soil profile, such as nitrogen, are low.

For irrigated conditions, an irrigation water management plan should minimize non-point pollution of surface and groundwater resources.

Chiseling and subsoiling can improve permeability, root penetration, and aeration where water movement is restricted in some soils. Avoid inversion tillage that can bring salinity to the surface and interrupt the leaching process.

Green manure crops or applications of organic matter can improve soil structure and permeability.

Applications of gypsum, sulfur, or calcium will help in displacing sodium from the root zone.

Water of slight to moderate salinity not dominated by sodium can enhance leaching of salts.

Residue management can improve the organic matter content of the soil, improve infiltration, and minimize surface evaporation and capillary rise of salts to the soil surface.

Consider selecting crops with tolerance to salinity/sodium levels in the soil.

Consider using bedding and planting methods designed to reduce salinity near plant root zone, especially for germinating seeds.

PLANS AND SPECIFICATIONS

Specifications for establishment and operation of this practice shall be prepared for each field or treatment unit according to the Criteria, Considerations, and Operation and Maintenance described in this standard. Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

OPERATION AND MAINTENANCE

Continued monitoring through observation wells (if applicable) and soil test EC to manage saline seep recharge areas as well as other saline soil areas is necessary for crop production. Maintaining conservation practices (such as no-till) that keep the soil surface covered are necessary so that surface soil evaporation is minimized and salts in the soil do not move back to the soil surface.

REFERENCES

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