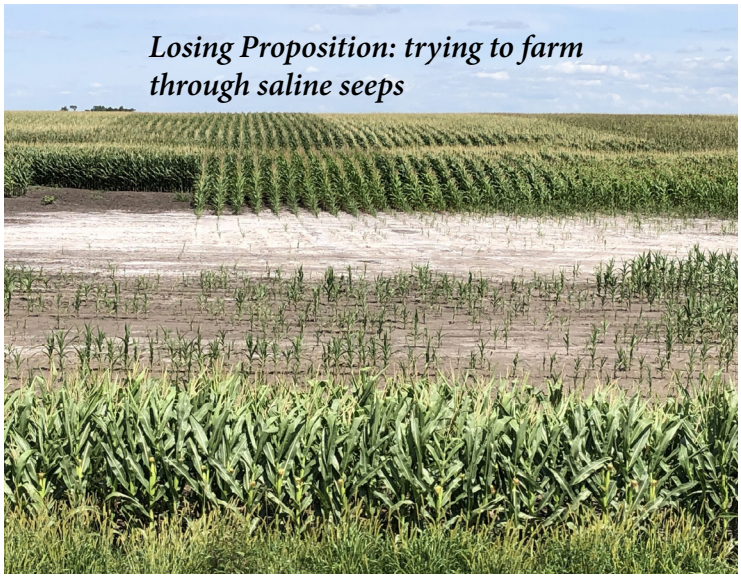
USDA United States Department of Agriculture

A Better Way to Manage Saline Soils

Got white spots in your field?

Those white spots in your corn and soybean fields that are likely increasing in size come from salt deposited at a time South Dakota was under sea waters. They became a bigger problem after a lengthy wet cycle in the 1990's, along with a shift from diverse cropping systems to more intensive corn and soybean row cropping.

Each time the water table rises with more rainfall, capillary action moves the salts upward to the soil surface. While modern large equipment allows planting rowcrops through saline seep areas, it's costly, with higher inputs and significantly lower yields. The longer the seeps are cropped, the more the land is degraded. Over time, the accumulated salt deposits severely limit yields.



Losing Proposition: trying to farm through saline seeps

Here's the best advice on managing them.

Anthony Bly, Extension Soils Field Specialist at South Dakota State University, has observed and studied saline soils for years. For more profitable and long term improvement of saline soils, he recommends integrating soil conservation practices, including:

- Maintain or reintroduce perennial grasses and pastures in areas prone to salinity.
- Implement diverse crop rotations that include deeprooted plants that help regulate soil moisture.
- Use precision agriculture to identify and manage saline-prone areas separately from other parts of the field.
- Understand that tile drainage can have unexpected consequences on salinity in other parts of a field.

Better Choice: Plant Perennials

Perennials are Profitable! *Brothers Jeff and Scott Hamilton have been battling saline soils for years. See back side to learn why they've settled on planting a perennial mix as their best economic and land use option.*

This fact sheet was produced by the Growing Resilience team on behalf of the South Dakota NRCS and its partners. More information online at:
https://www.growingresiliencesd.com/soilsalinity

GROWING RESILIENCE
THROUGH OUR SOILS

A Better Way to Manage Saline Soils (continued)

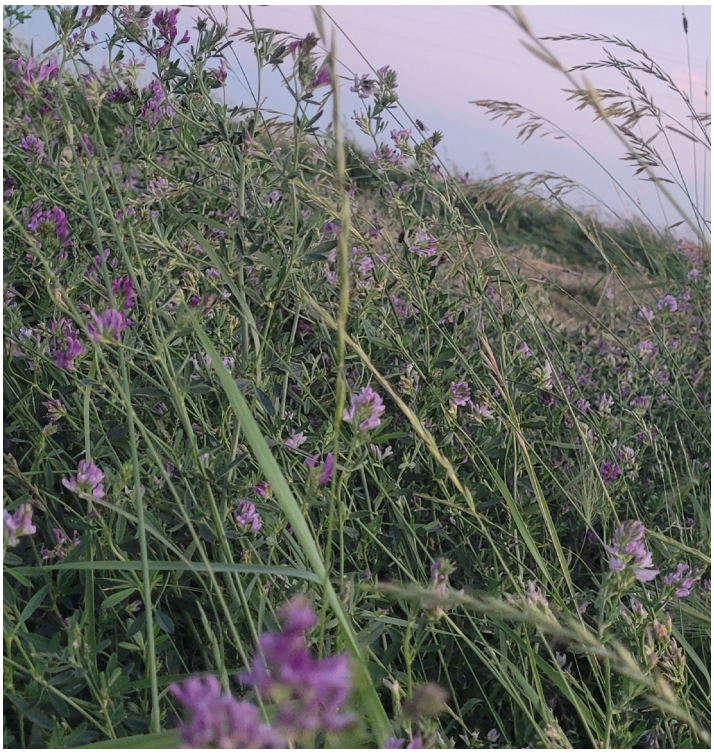
The Hamilton brothers regenerated saline soils that were growing nothing to producing more than 3 tons/acre of forage.

Scott and Jeff Hamilton

Jeff and Scott Hamilton's land near Arlington was persistently flooded in the 1980's. Land that had once grown wheat and small grains was becoming barren from increasing salinity.

After years of struggling to disk and plant crops unsuccessfully, they turned to perennial grasses, working with a seed company to develop the "Hamilton Blend." Since 2016, they have converted 150 acres of saline land into productive forage with a diverse mixture of wheatgrass, garrison creeping foxtail, fescue, and salinity-tolerant alfalfa. Land that once produced nothing now yields up to 3½ tons of hay/acre.

More efficiency comes from grazing the areas, and using variable rate planting and fertilizing.



The Hamilton Blend: deep roots move salts lower in the soil profile, regenerating productive soils.

"I got tired of growing nothing, and the land was going backwards. We stopped spraying those areas. We also found it's a mistake to seed only the saline spot to grass; the saline area will fill in and recover a lot faster if you seed just three rounds outside the salt to grass."

--Jeff Hamilton

"If we can get kochia growing, our livestock will harvest it. In the vegetative state, cattle really like kochia. To make this work, crop farmers need to change to a mindset that hay is a crop."

--Scott Hamilton

Mature kochia growing on saline soils.

Perennial plant success monitored over time

The 8-year Cain Creek Project in Beadle County planted salt tolerant alfalfa and AC Saltlander wheatgrass on severely degraded land in 2015. After 8 years, the study concluded this perennial vegetation reduced salinity and sodicity by 100 times, by drawing salts deeper into the soil.

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