Soil, Climate, Farming and Carbon

Some summary background information for Lake Okoboji CCL conference panel discussion.

The latest UN climate convention (COP21) seeks to limit global temperature rise by curbing use of fossil fuels, but will require increased carbon storage to reach its goals.

Some soil science and government leaders have proposed an ambitious, aspirational goal called the "4 per Thousand" plan that seeks to increase the total amount of organic carbon in world soils by 0.4% per year.

Soil carbon content can be increased by:

- regenerative farming practices on crop and grazing lands
- restoration of degraded lands
- reforestation and agroforestry
- re-establishment of wetlands
- rewilding fragile agricultural land

Regenerative farming practices featuring more continuous plant cover include:

- more complex crop rotations
- use of cover crops
- conservation tillage or no-tillage leaving crop residue on the surface
- organic farming practices such as use of manures for fertilization
- pasture/grass-based production using managed grazing practices to raise ruminant animals
- developing new perennial crops such as Kernza

Plants put carbon into soil principally through root growth and decay; use of cover crops keeps plants growing as long as possible through the year, increasing the potential for building up soil organic carbon.

Regenerative, soil-building farming practices have the multiple benefits of storing carbon in the soil, increasing soil health, protecting soil from erosion, protecting water and providing nutritious food to eat.

The US Farm Bill needs to be changed so that payout schemes support more small- and midsized farming operations and encourage regenerative, soil-building farming practices. As currently structured it predominantly benefits industrial-scale grain, biomass and animal production.