NRCS Resource Concerns

Resource Concerns

Soil

Water

Air

Plant

Animal

Energy

Soil

Sheet, Rill and Wind Erosion
Concentrated Flow Erosion
Shoreline, Bank, and Channel Erosion
Soil Compaction
Soil Organic Matter

Sheet, Rill, and Wind Erosion

Problem: loss of soil from rainfall runoff/splash, irrigation runoff, or wind that degrades soil quality

Symptoms of erosion by water can be identified by:

- Small rills and channels on the soil surface
- Soil deposits at the base of slopes
- Sediment in streams, lands, and reservoirs
- Pedestals of soil supporting pebbles and plant materials

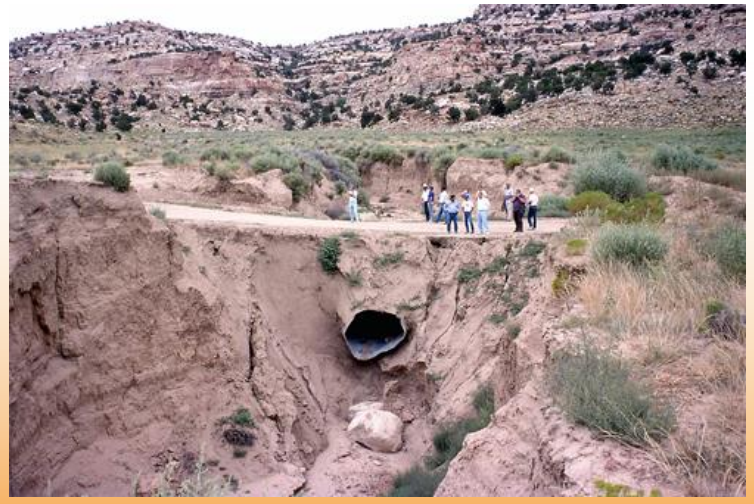
Solution

- Maintain protective vegetation cover
- Control runoff amounts and rates
- Use high residue, perennial, and sod crops
- Grow cover crops
- Manage tillage and crop residues
- Shorten length and steepness of slopes in fields
- Plant windbreaks
- Cultivate on the contour
- Manage livestock grazing

Concentrated Flow Erosion

Problem: concentrated flow erosion caused by runoff from rainfall, snowmelt, or irrigation water

Untreated classic gullies may enlarge progressively by headcutting and/or lateral widening



Solution

- Increase vegetation cover
- Improve water infiltration
- Cover crops
- Conservation cover
- Tillage and residue management
- Prescribed grazing
- Grade stabilization structures
- Lined waterways or outlets

Shoreline, Bank, and Channel Erosion

Problem: accelerated bank erosion caused by altering the stream system or watershed conditions

Streambank erosion increases sediment in the stream by degrading water quality and resulting in the loss of fertile bottomland.

The quality of wildlife habitat is impacted by on land and in the stream.

Solution

- Stream restoration techniques
- Soil bioengineering practices
- Native material reventments – combinations of rock and vegetation, and in-stream structures to help stabilize eroding banks

Soil Compaction

Problem: compaction can result in shallow plant rooting and poor plant growth, influencing crop yield and reducing vegetative cover available to protect soil from erosion

By reducing water infiltration into the soil, compaction can lead to increased runoff and erosion

Solution

- Decrease tillage and other soil disturbance and increase soil organic matter

- Implement a conservation system that uses cover crops, crop residues, perennial sod, and/or reduced tillage

Soil Organic Matter

Problem: organic matter affects critical soil functions including soil structure and water and nutrient holding capacity

Managing for increased soil organic matter can enhance soil productivity and reduce the severity and costs of natural phenomena such as drought, flood, and disease

Solution

- Leave crop residues in the field
- Crop rotations that include high residue plants
- Optimal nutrient and water management practices
- Cover crops
- Apply manure or compost
- Use low or no tillage systems
- Mulching

Soil Salts and Chemicals

Problem: salinity or sodicity may occur naturally or result from management practices

Fertilizers, soil amendments (gypsum, lime) and manure may contribute to salinity problems.

Applications of saline and/or sodoc irrigation water may increase soil salts

Solution

- Proper use of irrigation water
- Use salt-tolerant crops
- Use cropping and tillage systems that promote high residue and soil organic matter

Water

Inefficient Use of Irrigation Water
Inefficient Moisture Management
Ponding, Flooding, Other Excess Water
Water Quality Degradation – Nutrients
Water Quality Degradation – Pathogens
Water Quality Degradation – Sediment

Inefficient Use of Irrigation Water

Problem: agriculture account for more than 85% of the nation's annual water consumption. There is increasing competition for water.

Inefficient use of irrigation water

- **Impacts water quality and quantity**
- **Negatively affects farm profitability**
- **Affects long-term drought conditions**
- **Depletes critical ground water**

Solution

- Irrigation water management to control water application amounts and timing is critical
- Irrigation wells and pumps, pipelines, lined irrigation ditched, and land leveling
- Off stream storage of water during periods of excess runoff
- Water re-use, recycling, and ground water recharge

Inefficient Moisture Management

Problem: inefficient moisture management can result in increased runoff and reduced soil moisture

- **In cropland, poor yields may be related to an insufficiency of soil moisture rather than an insufficiency of rainfall**

- **In some grassland systems, available water can be tied up by brush**

Solution

- Manage plant residue and cover
- Use mulch and residue management
- Weed control techniques and tools
- Minimize soil compaction
- Brush management can help restore hydrologic function on rangeland
- Use plants that are more tolerant of drought

Ponding, Flooding, Other Water

Problem: water can flood or pond and restrict plant growth and land use. Wind-blown snow can restrict access to humans and animals

Solution

- Maintain vegetative cover on the land
- Improve soil infiltration and reduce soil compaction
- Drainage management and structures for water control
- Floodplain management
- Wetland restoration or enhancement

Water Quality Degradation – Nutrients

Problem: nutrients are transported to lakes, streams, and groundwater in quantities and degrade water quality

Solution

- Nutrient management to control the source, amount, timing, and method of application
- Vegetative buffers along streams capture nutrients before they enter the stream
- Irrigation water management and conservation practices that increase water infiltration

Nutrients and Pesticides

Evaluate nutrient and pesticide use to assess and mitigate the environmental risks

- Kinds, amounts, application methods, timing of nutrients and pesticides
- Knowledge of the soils
- Lakes and streams, and other bodies of concern downstream
- Groundwater depth
- Irrigation runoff and leaching amounts

Water Quality Degradation – Pathogens

Problem: many potential pathogens can be found in manure

Pathogens may enter ground or surface water posing a potential risk to human and animal health

Solution

- The most effective tool in eliminating pathogens from manure is time
- Manage the rate, timing, and method of application of manure

Water Quality Degradation – Sediment

Problem: sediment from erosion degrades surface water quality, clogs stream channels, and covers fish spawning grounds

Solution

- Control the source of soil erosion
- Maintain vegetation cover
- Use streambank protection practices
- Grow perennial crops
- Shorten the length and steepness of crop slopes
- Establish riparian forest

Plant Productivity and Health

Problem: plant productivity is not adequate due to improper management or fertility

Natural events (i.e. drought) can cause plant stress. Plants under stress are more susceptible to disease and insect damage

Solution

- Nutrient management will specify the amount, timing, and method of nutrient application
- Pest management practice will specify techniques to detect, avoid, and treat pests and diseases
- Prescribed grazing, prescribed burning, cover crops, tillage and residue management

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THANK YOU

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