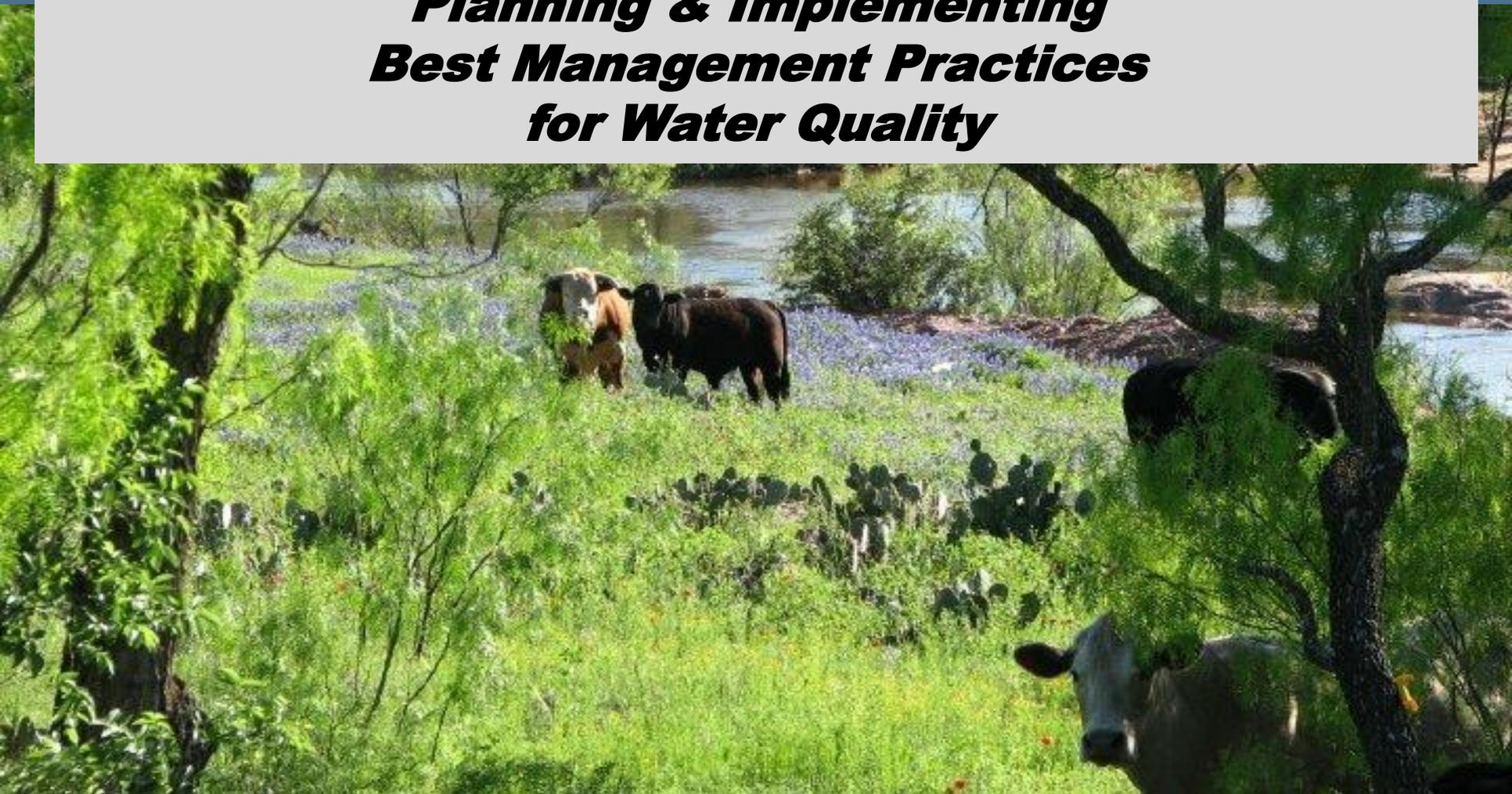




United States Department of Agriculture

Planning & Implementing Best Management Practices for Water Quality



**Agricultural BMPs for Watershed Planning Training
Riesel, TX
October 2018**

Helping People Help the Land



- The NRCS works with landowners to develop conservation plans implementing practices such as nutrient management, cover crops, prescribed grazing, waterways, fences and buffers.
- The Environmental Quality Incentives Program (EQIP) can be utilized for financial assistance with the installation of appropriate conservation practices.

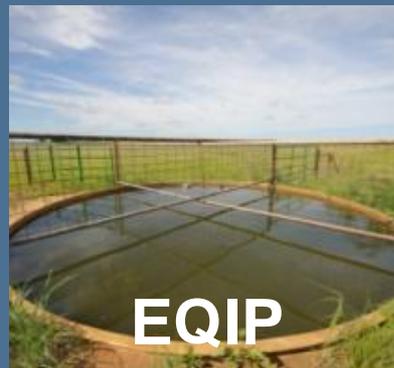


United States Department of Agriculture

Financial Assistance Programs



Agricultural Act of 2014 Conservation Programs



ACEP – Agricultural Land Easement (ALE)

- Helps landowners restore and protect grassland, including rangeland and pastureland, and certain other lands, while maintaining the areas as grazing lands.
- Program emphasis is on support for grazing operations, plant and animal biodiversity, and grasslands under the greatest threat of conversion.
- Enrollment options:
 - Permanent easements
 - Rental agreements



Environmental Quality Incentives Program (EQIP)



EQIP offers financial and technical assistance to agriculture producers to promote agriculture production and environmental quality as compatible goals.

ACEP - Wetlands Reserve Easement (WRE)

A voluntary, non-regulatory, incentive-based program that helps private landowners, farmers and ranchers protect and restore wetlands on their property.



Enrollment options:

- Permanent easement
- 30-year easement
- 10-year restoration agreement

Conservation Stewardship Program (CSP)



- CSP pays farmers who are improving conservation treatment on their working lands.
- Encourages the continuation of practices that benefit soil, water and air resources.
- A person or legal entity cannot receive CSP payments exceeding \$200,000 during any five-year period.

Regional Conservation Partnership Program (RCPP)



- New program designed to be an all encompassing program focused project.
- Uses EQIP, CSP, and ACEP WRE and ACEP ALE programs
- Addresses a multitude of resource concerns

CTA- Conservation Technical Assistance

The CTA Program provides land users with proven conservation technology and the delivery system needed to achieve the benefits of a healthy and productive landscape. Technical assistance is the help provided by NRCS to address opportunities, concerns, and problems related to the use of natural resources.

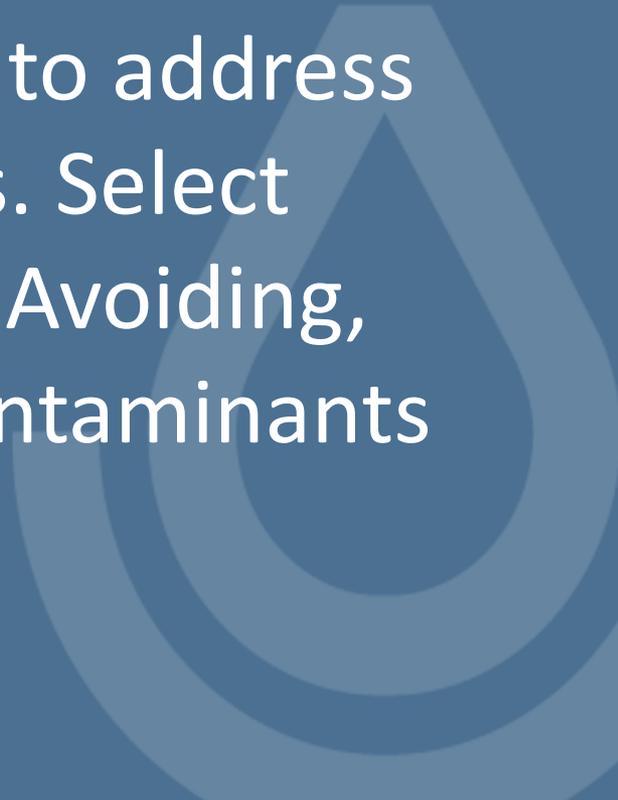


- Assist individuals or groups of decision makers, communities, conservation districts, units of State and local government, tribes, and others to voluntarily conserve, maintain, and improve natural resources
- Provide community, watershed, and area-wide technical assistance in collaboration with local units of government, to develop and implement resource management plans that conserve, maintain and improve natural resources

The ACT

Avoid, Control or Trap

Use a “systems approach” to address your resource concerns. Select appropriate practices for Avoiding, Controlling, or Trapping contaminants

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Avoid

Practices such as *Nutrient Management*, *Cover Crop*, and *Conservation Crop Rotation* help producers avoid pollution by reducing the amount of nutrients available in runoff or leaching into water bodies and watersheds. Practices such as cover crops and crop rotation help take up nutrients to avoid potential runoff and pollution. Crop rotations that include differing crops, such as legumes, can limit amounts of commercial nutrients applied.

Control

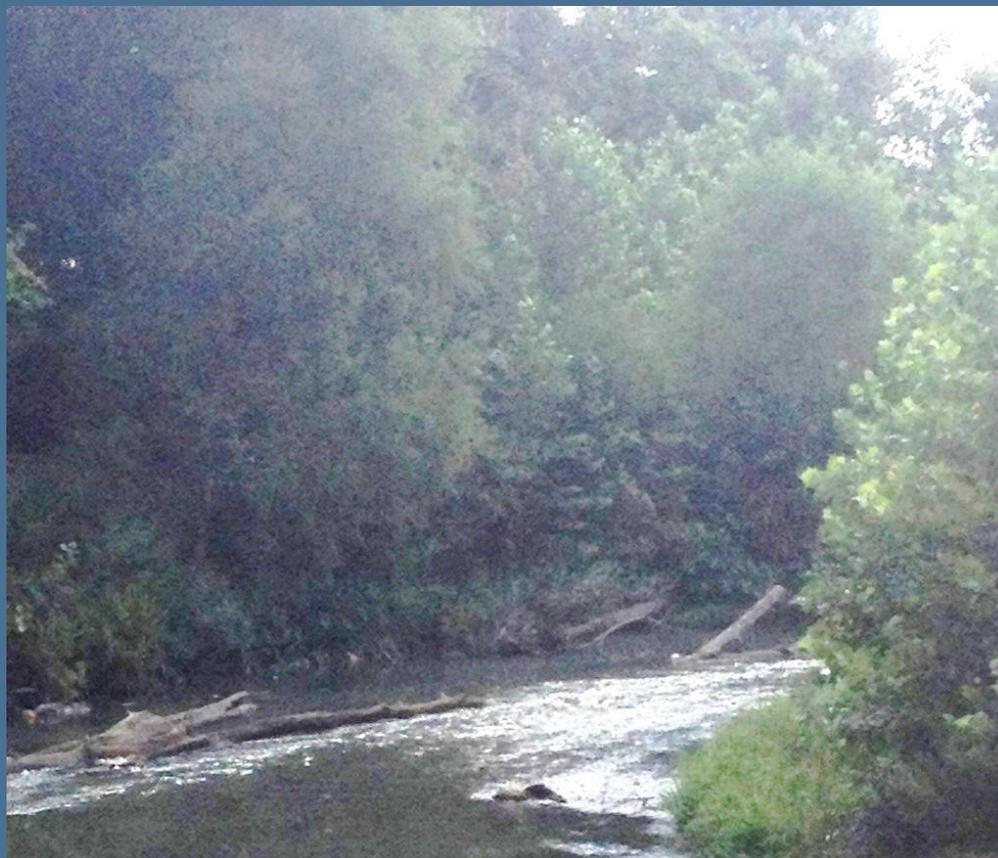
Land treatment in fields or facilities that prevents the loss of pollutants includes practices such as conservation tillage and residue management, which improve infiltration, reduce runoff, and control erosion. Specific practices such as *No-till/Strip/Till/Direct Seed*, *Mulch Tillage*, and *Ridge Till* are foundation practices to recommend to producers. Practices such as *Cover Crop* will also do double duty by helping with Avoidance as well as Controlling. Other facilitating practices, such as *Terraces* or *Stripcropping*, help control erosion and may manage runoff to reduce nutrients loading.

Trap

The last line of defense against potential pollutants is to trap them. Practices such as Contour Buffers, Filter Strips, Riparian Buffers and the suite of practices to create, enhance, and/or restore wetlands all serve to trap and uptake nutrients and sediments before entering water bodies.

PRACTICES UTILIZED IN RIPARIAN AREA CONSERVATION WORK

- Riparian Forest Buffer
- Riparian Herbaceous Buffer
- Fencing
- Alternative Water Sources
- Filter Strips
- Grassed Waterways
- Prescribed Grazing
- Livestock Exclusions
- Brush Control
- Others as needed





Conservation Buffer Practices

Contour Buffer strips

Field Borders

Filter Strips

Grassed Waterways

Riparian Forest Buffers



Contour Buffer Strips



Strips of perennial vegetation alternated with wider cultivated strips that are farmed on the contour.

Field Borders



A band or strip of perennial vegetation established on the edge of a cropland field.

Filter Strips

An area of grass or other permanent vegetation used to reduce sediment, organics, nutrients, pesticides, and other contaminants from runoff and to maintain or improve water quality.



Grassed Waterways



A natural or constructed vegetated channel that is shaped and graded to carry surface water at a non-erosive velocity to a stable outlet that spreads the flow of water before it enters a vegetated filter.

Riparian Forest Buffers



An area of trees and shrubs located adjacent to streams, lakes, ponds, and wetlands.

Residue Management Practices

- No Till
- Reduced Till



No Till

- Limiting soil disturbance to manage the amount, orientation and distribution of crop and plant residue on the soil surface year around.
- This practice only involves an in-row soil tillage operation during the planting operation and a seed row/furrow closing device. There is no full-width tillage performed from the time of harvest or termination of one cash crop to the time of harvest or termination of the next cash crop in the rotation regardless of the depth of the tillage operation.
- The STIR value shall be no greater than 20.



Reduced Till



- Managing the amount, orientation and distribution of crop and other plant residue on the soil surface year round while limiting the soil-disturbing activities used to grow and harvest crops in systems where the field surface is tilled prior to planting.
- This practice includes tillage methods commonly referred to as mulch tillage or conservation tillage where the entire soil surface is disturbed by tillage operations. It also includes tillage / planting systems with few tillage operations but which do not meet the STIR criteria for No Till.
- The STIR value rating shall be no greater than 80, and no primary inversion tillage implements shall be used.

Cropland Practices

- Conservation Crop Rotation
 - Nutrient Management
 - Pest Management
 - Terraces
 - Contour Farming
 - Grassed Waterway
 - Residue Management
 - Conservation Buffers
- Irrigation Water Management

Conservation Crop Rotation

- Growing crops in a planned sequence on the same field.
- Some of the water quality benefits of this practice include:
 - Reduce sheet-and-rill or wind erosion
 - Improve soil quality
 - Manage the balance of plant nutrients
 - Supply nitrogen through biological nitrogen fixation to reduce energy use
 - Conserve water.



Nutrient Management

Managing the amount (rate), source, placement (method of application), and timing of plant nutrients and soil amendments.



Purpose

- To budget, supply, and conserve nutrients for plant production.
- To minimize agricultural nonpoint source pollution of surface and groundwater resources.
- To properly utilize manure or organic by-products as a plant nutrient source.
- To protect air quality by reducing odors, nitrogen emissions (ammonia, oxides of nitrogen), and the formation of atmospheric particulates.
- To maintain or improve the physical, chemical, and biological condition of soil.

Integrated Pest Management

Integrated Pest Management -managing agricultural pest infestations (including weeds, insects, and diseases) to reduce adverse effects on plant growth, crop productions, and environmental resources.

- From a NRCS Standpoint it's a site-specific combination of pest prevention, pest avoidance, pest monitoring, and pest suppression strategies.
- IPM strategies ("PAMS" or Prevention, Avoidance, Monitoring and Suppression) shall be employed to prevent or mitigate pest management risks for identified natural resource concerns.
- For identified water quality concerns related to pesticide leaching, solution runoff and adsorbed runoff, the current version of the USDA-NRCS WIN-PST program will be used to evaluate potential risks to humans and/or fish, as appropriate, for each pesticide to be used.



Terraces and Contour Farming



- **Terraces** -earth embankment, a channel, or a combination ridge and channel constructed across the slope.
- **Contour Farming** - farming sloping land in such a way that preparing land, planting , and cultivation are done on the contour.

Irrigation Water Management



- Determining and controlling the rate, amount, and timing of irrigation water in a planned and efficient manner.
- Inefficient irrigation can cause water quality problems. In arid areas, for example, where rainwater does not carry residues deep into the soil, excessive irrigation can concentrate pesticides, nutrients, disease-carrying microorganisms, and salts—all of which impact water quality—in the top layer of the soil. Improving water use efficiency can reduce Non Point Source pollution from irrigation.



Grazing Lands Practices

- Prescribed Grazing
 - Water Source
 - Conservation Buffers
 - Nutrient Management
 - Pest Management
- 

Prescribed Grazing

The controlled harvest of vegetation with grazing or browsing animals, managed with the intent to achieve a specified purpose.

- Overgrazing exposes soils, increases erosion, encourages invasion by undesirable plants and reduces the filtration of sediment necessary for building stream banks, wet meadows, and floodplains.
- To reduce the impacts of grazing on water quality, farmers and ranchers can adjust grazing intensity, keep livestock out of sensitive areas, provide alternative sources of water and shade, and revegetate rangeland and pastureland.



Water Supply Practices



- Tanks, troughs, pipelines, ponds, and limited access points to supply water for livestock.
- Keeping animals out of streams and ponds is important to water quality, improved animal health and animal performance.



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HEALTHY SOILS ARE THE FOUNDATION OF HEALTHY ECOSYSTEMS



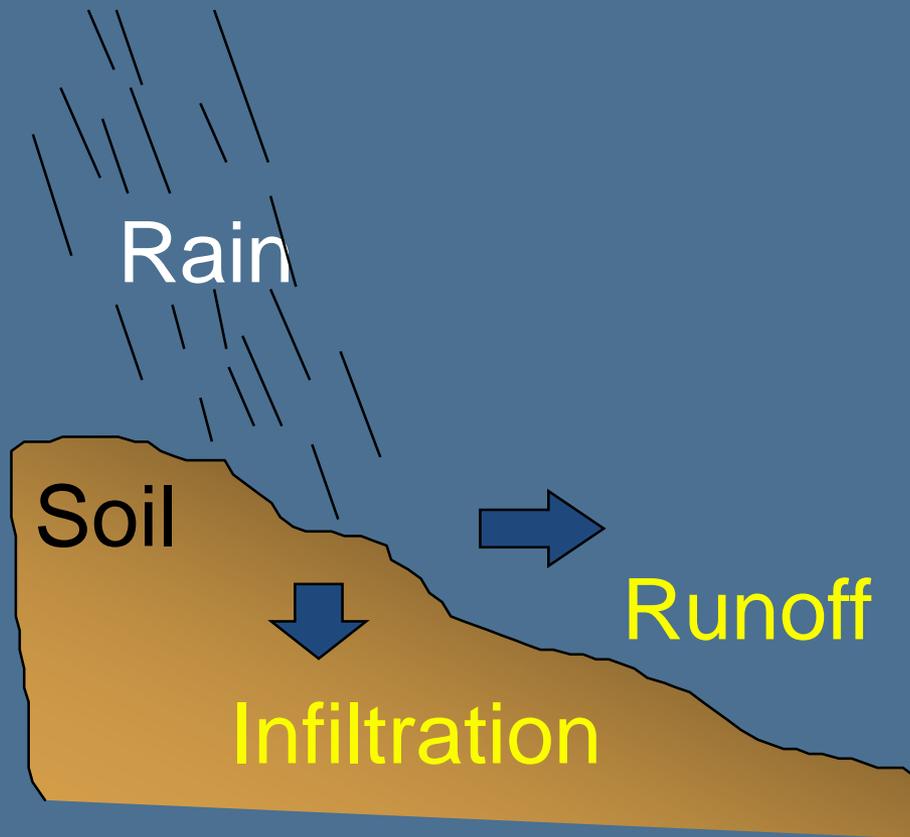
HEALTHY SOILS ARE THE FOUNDATION OF HEALTHY ECOSYSTEMS

Healthy soil gives us clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife, and beautiful landscapes. Soil does all this by performing five essential functions:

- Regulate and partition water**
- Sustaining plant and animal life**
- Filtering and buffering potential pollutants**
- Cycling nutrients**
- Physical stability and support**

Soil Functions

Regulating Water Flow

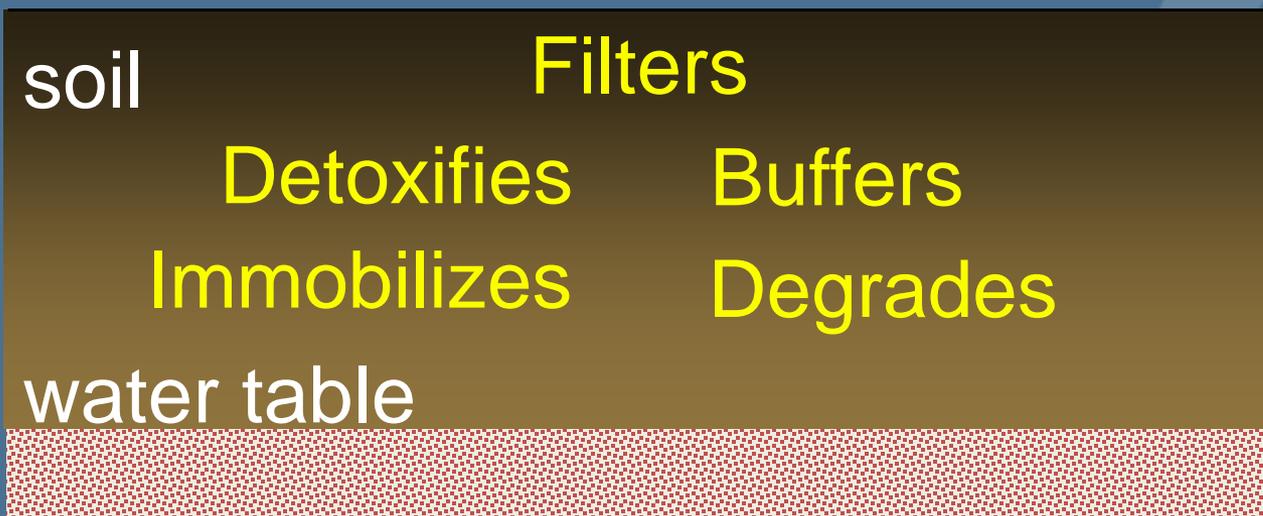


Regulating and partitioning water and solute flow

Soil Functions

Filtering and Buffering

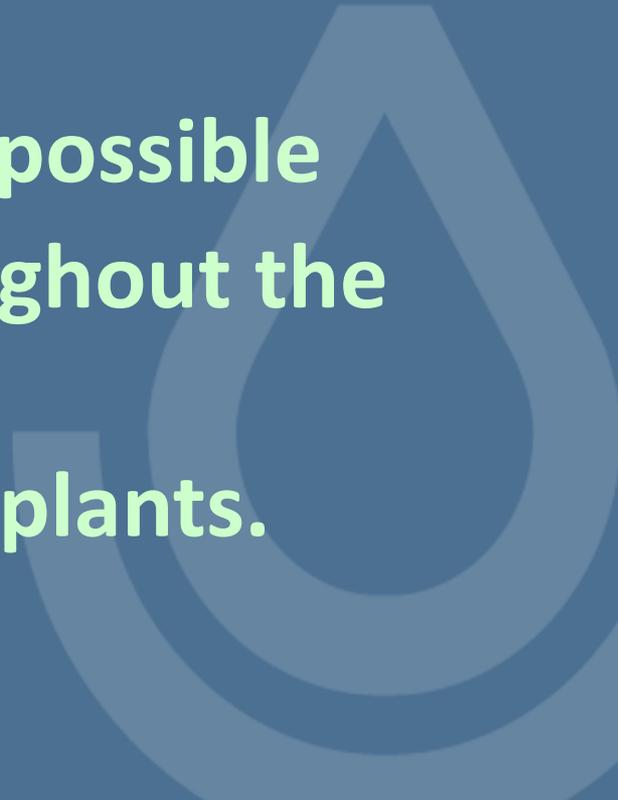
Organic & Inorganic materials



Healthy Soils Make Sense for Water Quality and Quantity

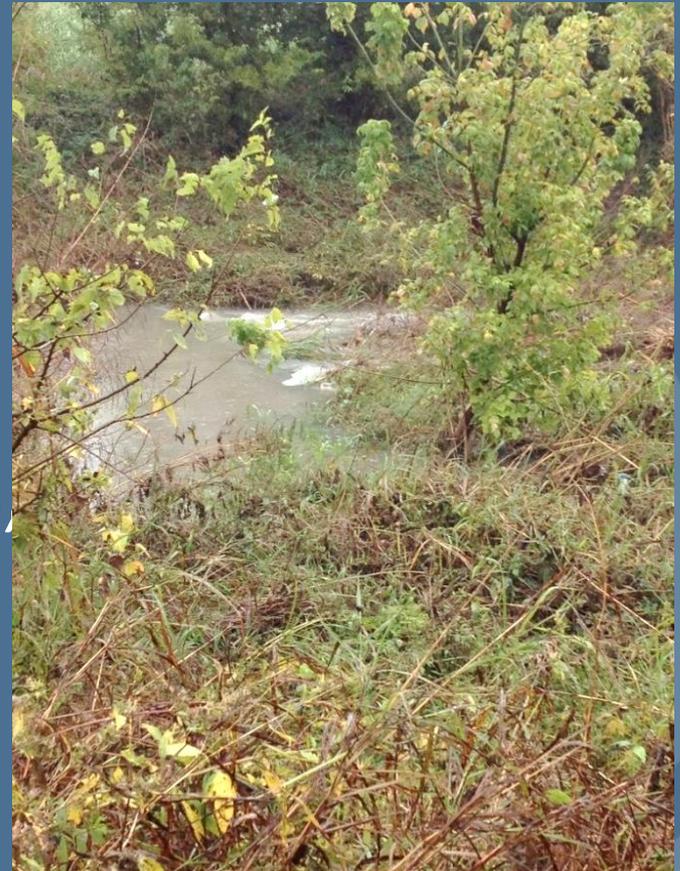
- The soil's water-holding capacity reduces runoff, and increases the availability of water to plants during droughts.
- Good infiltration keeps nutrients and sediment from loading into lakes, rivers, and streams.
- Healthy soils do a better job of filtering and buffering organic and inorganic materials which helps to protect our groundwater.

Five Basic Principals for Improving Soil Health

1. Keep the soil covered as much as possible.
 2. Disturb the soil as little as possible
 3. Keep plants growing throughout the year to feed the soil
 4. Grow a diverse mixture of plants.
 5. Integrate Livestock
- 
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HEALTHY RIPARIAN AREAS IMPROVE WATER QUALITY

Riparian Areas are our last line of defense. Thick vegetation helps to trap debris, sediments, nutrients, and other pollutants before they enter the stream.



HEALTHY UPLANDS IMPROVE WATER QUALITY



Runoff that occurs on the uplands, is channeled into drainages along highways, and then runs into the stream at a crossing completely misses the filtering effects of the riparian buffer.



United States Department of Agriculture

Questions?



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