

Soil conservation:

Soil Conservation is a combination of practices used to protect the soil from degradation. First and foremost, soil conservation involves treating the soil as a living thing. This means returning organic matter to the soil on a continual basis.

- ✚ Soil conservation involves treating the soil as a living ecosystem, and recognizing that all the organisms that make the soil their home, play important roles in producing a fertile healthy environment.
- ✚ They are responsible for breaking down organic matter --- releasing nutrients --- opening up spaces for the circulation of air and water.
- ✚ Because most organisms in the soil depend on dead plant and animal matter for their food and energy, soil conservation requires that organic matter be returned to the soil on a continual basis. Organic matter is what provides good soil structure and water holding capacity, promotes water infiltration, and protects the soil from erosion and compaction.



GOOD REASONS TO PRACTICE SOIL CONSERVATION

- ✚ **To maintain an adequate amount of organic matter** and biological life in the soil. These two components account for 90 to 95 percent of the total soil productivity.

- ✚ **To ensure a secure food supply at reasonable prices.** Soil conservation is proven to increase the quality and quantity of crop yields over the long term because it keeps topsoil in its place and preserves the long term productivity of the soil.
- ✚ **To grow enough food** not only for ourselves; but also for people in other countries where there are food shortages.
- ✚ To save farmers money. Erosion is currently costing farmers in lost income due to lower crop yields, and the loss of nutrients from the soil.
- ✚ To save citizens money.
- ✚ **To improve water quality.** All forms of life need clean water to survive. Agricultural and urban soil erosion are major sources of contamination of water supplies.
- ✚ **To improve wildlife habitat.** Soil conservation practices such as providing windbreaks or replacing soil organic matter, greatly enhance the quality of the environment for wildlife of all kinds.
- ✚ To help create an environment free of pollution where we can live safely.
- ✚ For the future of our children, so that they may have enough soil to support life. It has been said that the land has not so much been given to us by our forefathers, but has been borrowed from our children.

Soil erosion: Soil erosion refers to the erosion of the top layer of dirt known as topsoil, the fertile material vital to life. The rate of soil erosion depends on many factors, including the soil's makeup, vegetation, and the intensity of wind, rain and also human activities. Because our own activities can also influence the speed of soil erosion, we have the power (and the responsibility) to solve one of the planet's greatest environmental challenges by practicing the soil conservation methods.

Soil conservation practices:

Soil conservation helps protect natural resources and restores habitats for plants and wildlife, improves water quality and makes soil healthier. Productive and healthy soil helps farmers meet increased demand for agricultural products and drives economic growth.

- ✚ Eliminating the use of nitrogen fertilizer and fungicides can increase yields and protect the crops and soil.
- ✚ **Cover crops** are crops planted to reduce the impact of wind and water on bare soil. They absorb the impact of rain, reduce the speed of runoff, hold the soil in place, and encourage greater infiltration; and hence less runoff. Sweet clover, alfalfa, rye, and winter wheat are common cover crops. They are planted on areas susceptible to erosion like steep slopes, stream and river banks, grassed waterways or around wells to protect ground water supplies from contamination. Winter wheat or rye are often planted to provide cover over the winter and 95 to 100 percent erosion control during the spring runoff.
- ✚ **Cover crops** such as radishes are rotated with cash crops to blanket the soil all year – round and produce green manure that replenishes nitrogen and other critical nutrients. It also suppresses weeds.
- ✚ **No- till farming:** Tilling turns over about 10 inches of topsoil. It removes the plant covering and decreases the amount of nutrient rich organic matter. In no-till farming seeds are planted in narrow furrows, eliminating the need to plow.

No till farming protects the soil from moisture loss because cover crop residue remains on the surface. It also helps to increase the organic matter and microorganisms and enriches the soil.

- ✚ **Intercropping** involves mixing plants in a field - for example planting legumes between rows of corn or soybean. This technique may be used by a farmer who cannot afford to take his or her entire crop of corn out of production.



- ✚ **Natural fertilizers** include livestock manure, mulch, municipal sludge, and legume plants such as alfalfa or clover. Manure and sludge are applied by spreading it over the land and then working it into the soil. Strict guidelines must be followed in timing applications, since both sludge and manure can cause major water contamination if handled improperly. Legumes such as clover or alfalfa are grown and then tilled into the soil as "green fertilizer".
- ✚ Like chemical fertilizers, natural fertilizer replenish the soil with essential nutrients like nitrogen, phosphorus and potassium. However, they have the added benefit of providing the soil with organic matter.
- ✚ **Contour farming** involves tilling and planting along the contour, rather than up and down the slope. The furrows and rows of plants act as dams which slow down the flow of water moving down the slope. Unless some type of contour farming is used, particularly on long slopes, serious field erosion can result.



Fig. 3.6. Contour farming.

Contour farming also uses less fuel and power for tractors.

- ✚ Earthworms are among the most reproductive organisms in soil. They digest plant matter, releasing essential nutrients into the soil, and their tunnel networks create air channels that help water move through the soil.

CROP ROTATION

Crop Rotation is an alternative to planting a field in the same crop year after year. Instead of planting the same crop year after year on the same plot of land, crop rotation involves planning out growing seasons for different crops. The main crop is rotated, ideally with cereal crops like clover and alfalfa.

Crop rotation provides several benefits. Crop rotation reduces the need for fertilizer and pesticides, lowering costs. It also helps prevent excess chemicals from entering water supplies, improving water quality. Rotation reduces the risk of insect and disease problems, thus decreasing a pesticide dependency. Because the crop is changed each year, pests do not have enough time to become established in damaging numbers.

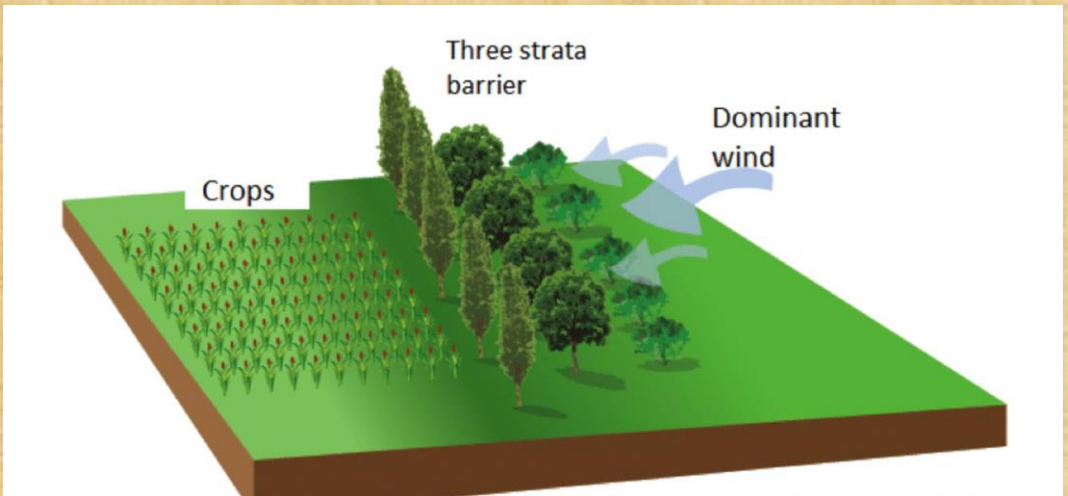


Forage crops or legumes such as clover and alfalfa are often used as green fertilizers meaning they are planted and later mixed in with the soil as a natural fertilizer and soil builder. Legumes have the special ability to take in atmospheric nitrogen and convert it to forms usable by other plants. (Atmospheric nitrogen is not in a form available to most plants). For this reason they are also referred to as nitrogen fixing plants.

When used as a green fertilizer, legumes return a significant amount of organic matter to the soil. Their deep roots create tunnels for air and water to enter the soil. All these characteristics in turn guard the surface against water and wind erosion.

WINDBREAKS

This soil conservation practice is used to reduce the power of winds and its disruptive effect on soil. It is a vegetation barrier designed to reduce or eliminate the velocity of the wind and hence reduce wind erosion. Windbreaks consist of one to five rows of trees or shrubs that are used to block and direct the wind. They can reduce soil erosion, increase crop yields and protect livestock from heat and cold.



The key goal of soil conservation is to protect it from degradation in any way, including depletion of fertility and erosion. The main task in reducing the erosion is to cover lands with crops or residues to avoid bare areas from disruption due to winds, the flow of water and rain splashes.

