

Sustainable Agriculture: Solving the Puzzle



Reducing nutrients
Mitigating airborne greenhouse gases
Restoring stream buffers and wetlands
Rejuvenating soil
Sequestering carbon
Increasing soil fertility
Reducing flooding

Improving water quality
Protecting crops during droughts
Reducing use of pesticides and fertilizers
Restoring soil microbes
Preventing soil erosion
Providing wildlife habitat

Transitioning to Sustainable Agriculture

Sustainable agriculture involves using farming techniques that are economically viable and that also maintain soil fertility for future generations, protect water resources from pollution and treat livestock animals humanely. A key feature of sustainable agriculture is that the farm will continue to be productive for generations to come.

In contrast, modern industrial agriculture is based on maximizing production as efficiently as possible, using economies of scale while externalizing as many costs as possible. This results in short-term economic gains and economic successes. Yet, it causes many unintended consequences such as loss of soil fertility; loss of carbon sinks such as wetlands and carbon retained in the soil, prairies and forests; and the inability of the land to accept all of the wastes produced by the farm and to recycle those wastes satisfactorily without polluting the environment. The existing industrial-scale agriculture techniques leak nitrogen from the soil into the water and air and result in excessive soil erosion. This nitrogen, along with phosphorus, caused the Dead Zone in the Gulf of Mexico, an area where no living animals can survive in the water. Furthermore, some of the techniques used in industrial agriculture, including storing liquid manure in pits and using synthetic fertilizer, emit large quantities of greenhouse gases.

Components of sustainable agriculture include:

- Protecting soil by restoring organic matter to increase the quantity of soil, by maintaining organic material in the soil to increase the soil fertility, and by using cover crops to protect the soil from erosion.
- Raising and marketing local foods.
- Encouraging consumption of healthy foods by advocating for eating less processed food as well as eating more fresh fruits and vegetables.
- Integrating animal agriculture as part of a system that returns nutrients to the land without polluting streams and endangering the health of the people who live and work in the area.
- Reducing the need for artificial chemicals - herbicides, pesticides, fungicides - applied to the land.
- Planting nitrogen-fixing crops to put nitrogen in the soil without using commercial fertilizers.
- Growing crops in a rotation that may include the planting of small grains, hay, fruits and vegetables, combined with strips of perennials. The perennial strips provide cover on the land, build soil, provide wildlife habitat and reduce erosion from the fields.
- Using beneficial insects to reduce pests as well as to pollinate the crops.

Sustainable agriculture supports the resiliency of the land to absorb and recycle wastes without creating pollution. Sustainable agriculture is also able to restore soil fertility and to maintain that fertility year-after-year. Further, land farmed sustainably will be better able to absorb and hold water, thus be able to reduce flood risks in the neighboring communities. The ability of the soil to hold water will enable the farmer to produce a higher yield during dry periods.

Among the techniques that are more sustainable and that reduce the amount of greenhouse gas emissions are:

- Implementing no-till farming to reduce the number of times equipment crosses the fields.
- Adopting techniques of raising animals that include rotational grazing, deep-bedding animals and composting manure.
- Allowing grass-fed animals to spread their own manure and harvest their own feed thereby reducing the amount of energy spent on operating farm equipment and reducing the amount of greenhouse gas emissions.
- Reducing the amount of commercial fertilizers used by adopting organic techniques, using cover crops, improving the amount of organic material in the soil.