

BACKYARD CONSERVATION

NO-TILL GARDENING INCREASES GARDENING SUCCESS

Gardens have long provided people with a means of fresh, healthy produce while providing an opportunity to connect with the earth. Success and failure in growing abundant gardens is mostly in the soil, the foundation of the garden.

Soil is a living, complex system made up of 25 percent air, 25 percent water, 45 percent minerals, and 5 percent organic matter. Organic matter is the fraction of the soil composed of anything that once lived. Soil organic matter includes plant and animal remains in various stages of decomposition, cells and tissues of soil organisms, and substances from plant roots and soil microbes. Well-decomposed organic matter forms humus, a dark brown, porous, spongy material that has a pleasant, earthy smell. Even though in most soils, the organic matter accounts for less than 5 percent of the volume, this fraction serves as an important component in the soil and for soil health. Healthy soil is important for a healthy garden and the produce it provides.

To Till or Not to Till

Tillage of soil negatively impacts soil structure. The structure of the soil is important for a healthy, productive substrate for plant growth and vegetable production. Soil structure refers to the arrangement of clay, silt, sand particles, and organic matter. Soils that have a more granular structure will have adequate pores, allowing space for air, water, soil organisms, and plant nutrients to move into and through the soil easily. Soils that have been tilled, typically will have the following characteristics:

- Compacted with fewer and smaller pore spaces, which hinders water and air movement in and out of the soil
- Higher evaporation rates, or loss of soil moisture
- Higher surface soil temperatures
- Lower organic matter content
- Negatively impacted soil biological communities
- Weed pressure, due to weed seeds being brought to the soil surface

By not tilling the soil, soil organic matter can be built up allowing for improved stability of soil aggregates, reduced soil crusting, increased rate of water infiltration into the soil, reduced runoff, lower soil surface temperatures and soil moisture evaporation rates, and easier penetration of plant roots. It also provides a favorable habitat and food source for soil organisms living in the soil. No tillage of the garden soil is important for building and maintaining soil health for a more productive garden.



Not tilling the soil in a garden helps build and maintain soil health for a more productive garden.

Let's Get Started!

Tools you can use:

Jab planter, pick axe, heavy-duty pizza cutter or sheetrock knife, table spoon, regular table fork, and screwdriver

Steps:

1. Select the garden site and flag it. Make sure your garden site will have plenty of sunlight and is not in an area where water may pool.
2. If the site has grass or weeds, prepare by covering with either biodegradable fabric (available at local soil conservation district offices), cardboard, newspaper, or other materials/methods to stop the growth.
3. After a week, the seeds may be planted. If a cover was used, a slit will need to be cut with a sharp tool such a pizza cutter, followed by use of a screwdriver or spoon to open the soil just enough to plant the seed. If no cover is used and planting into residue, then use of a screwdriver, spoon, or jab planter can be used to open soil for seed planting. The main idea is to use tools that cause little soil disturbance. Potatoes can be placed upon the surface of undisturbed soil with six to eight inches of alfalfa hay placed over them. The alfalfa hay provides cover, nutrients, and reduces soil moisture evaporation. The potato harvest is also made easier by the alfalfa cover, by simply lifting up the plants.
4. Water once a week, and patiently wait for the plants to emerge.
5. Mulch the garden once the plants are well established with straw, dried leaves, or grass clippings (free of chemicals such as 2,4-D and weed control products). Other materials may be used such as alfalfa hay. Applications of good-quality compost may also be added. Continue mulching as needed. Water the mulch to help hold it in place.
6. Harvest produce as needed and enjoy.
7. As garden crops are harvested, replace with a cover crop which then continues to harvest carbon dioxide (CO₂) and sunlight from the atmosphere, providing carbon (food) to soil organisms through root systems as sugars as well as soil nutrients for next year's garden. The cover crops, which will winter kill, also provide an opportunity to provide pollinators with a flowering plant. Examples of cover crops species to use include sorghum, soybean, cowpea, pea, lentil, canola, mustard, flax, oat, barley, sunflower, buckwheat, turnip, and radish to name a few. Annual rye grass can also be planted. Keep in mind that cover crops are an opportunity to give your garden the crop diversity it may be missing. Finally, as a rule of thumb, plant the cool-season plants during the cool periods of spring/fall, and the warm-season plants during the summer. Stalks and vines should be left to serve as a snow catch and mulch with no fall tillage.
8. Following spring, do not till the garden soil. Plant seeds directly into the residue left behind. Make sure to rotate crops to a different location within the garden the following year (for example, plant corn where beans or peas were planted the year before to take advantage of the fixed nitrogen produced by the legumes).
9. Take a soil sample from your garden occasionally for testing of soil nutrient levels and organic matter content to ensure your soil is in good health.
10. Have fun learning and trying new things each year. No two gardens will ever be the same.

Gardening can provide a connection with soil health – food health – and people health. Bon Appetit!



Select a garden site and flag it.



A screwdriver can be used to open the soil just enough to plant the seed.



After planting, water once a week and wait for the plants to emerge.



Mulching conserves moisture and helps control weeds.



Have fun learning and doing new things each year!