

No-till gardening keeps soil—and plants—healthy

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While the practice of no-till gardening is not new, information has traditionally centered on agricultural field crops. Now, home gardeners are catching on.

"The concept of no-till has been around for a couple of decades, but research has been very focused on [field crops](#) like wheat and corn, things largely grown in the Midwest," said Erica Chernoh, Oregon State University Extension Service horticulturist. "There's not much on vegetable production or fruit. There's a lot to learn, and research is ongoing."

No-till gardening minimizes [soil](#) disruption, which compacts the soil and destroys the pathways that channel air and water through the soil, Chernoh said. Every time a tiller cuts through soil the structure is weakened, which can cause compaction and increase runoff. There's also erosion and surface crusting that results from over-tilling, Chernoh said.

In addition to disturbing [soil structure](#), tilling disrupts the microorganisms and other soil dwellers that live in the top couple of inches and are essential for soil and plant health, she said. Soil microbes, some of which have a symbiotic relationship with plants, cluster around roots, and as they feed on [organic matter](#) and each other, secrete nutrients that feed plants and substances that act as glue to bind [soil particles](#) into larger aggregates that keep soil pores open. Long strands of fungal hyphae can hold the aggregates together, and earthworms and other large organisms also work to create pore space.

Weed seeds, some of which can remain dormant in the soil for several years, come to the surface under the blades of a tiller, then germinate and become a problem. A big part of no-till gardening is keeping the soil protected with a mulch layer, leaving the seeds in place and suppressing any weeds that pop up.

No-till has its disadvantages, too, Chernoh said. Covering the soil makes it more difficult to direct seed into the bed, especially for home gardeners who don't have large seed drills. Mulch also keeps the soil from warming up as quickly in spring as unmulched beds. However, the

benefits far outweigh those drawbacks, she said.

"Mechanical tillage does have its place, especially in the formation of new garden beds with high compaction and low organic matter," she said. "In most cases, however, non-mechanical approaches to working with soil can help you accomplish your goals without the negative effects of tilling on your soil."

Soil coverage is also an important concept in a no-till system. For home gardeners, this can be achieved by using [cover crops](#) or mulch. Mulching materials may include straw, compost, aged livestock manure, dried leaves or grass clippings. Mulch will protect the soil from rain and wind, which can cause erosion. In [early spring](#), the mulch layer can be pulled back from the bed to allow sunlight to warm the soil.

One method of no-till gardening is often referred to as sheet mulching or lasagna gardening, and features layers of organic materials to create a healthy growing medium. It's a system in which organic materials, many of which would normally be sent to a landfill, are used to create a garden bed.

Cover crops are a big part of no-till farming, but can be a challenge for home gardeners because many need to be tilled in or sprayed with an herbicide to terminate the crop, Chernoh said. If using a winter cover crop, gardeners should plant in early fall and mow in spring after flowering, but before the plants set seeds and become weeds. You can transplant or direct seed into the fine cover crop mulch layer.

If using cover crops, be sure to select one that can be killed by cold temperatures or mowing rather than tilling or herbicides. Cover crops like Austrian winter peas, crimson clover or [fava beans](#) are good options for [home gardeners](#) using no-till methods.

When cleaning up the garden at the end of summer, gardeners can cut off the tops of cover crops plants and leave the roots in the soil. There's less disruption and the roots will decompose and provide food for the microorganisms. The clippings can be used as a mulch

"A lot of people create beds with the lasagna style," Chernoh said. "You can even build one on top of the lawn. It's a no-till way of making a nice garden bed rather than turning the soil to make a new seed bed every year."

Here's how to create a lasagna bed, also called sheet mulching:

- Start in fall so the bed has all winter to start decomposing.
- Cut grass as low as possible, or start a lasagna garden on top of an old planting bed.
- Loosen soil with a digging fork to increase aeration. Even punching holes in the ground will work.
- Remove weeds.
- Build a raised bed frame or just mound up the layers of organic material into an unframed bed.
- Put a layer of cardboard overlapped an inch or two and water it.
- Cover with 2-inch layers of green organic material like grass clippings, fresh plant debris, fresh animal manure and food scraps that provide nitrogen and brown materials like dry leaves, wood chips, straw and shredded newspaper that are carbon sources. Repeat layers until the bed is about 18 inches.
- Top off with a 2- to 6-inch brown layer; thicker if you want to plant right away.
- Create beds only wide enough to reach into the middle and create paths lined with straw to walk on so soil doesn't get compacted.
- Lasagna beds will shrink as materials decompose and may need refreshed layers each year.
- Using transplants is easier in no-till gardening systems; the mulch

layer is easier to transplant directly into rather than direct seeding, especially for small-seeded crops like lettuce and broccoli. To transplant, use a trowel or other tool to make holes large enough to plant into. If directly seeding into the bed, pull back the mulch layer and smooth over the surface layer with a rake before seeding.

More information: For more information, see the article [Three methods for no-turn cold composting](#).

Provided by Oregon State University

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