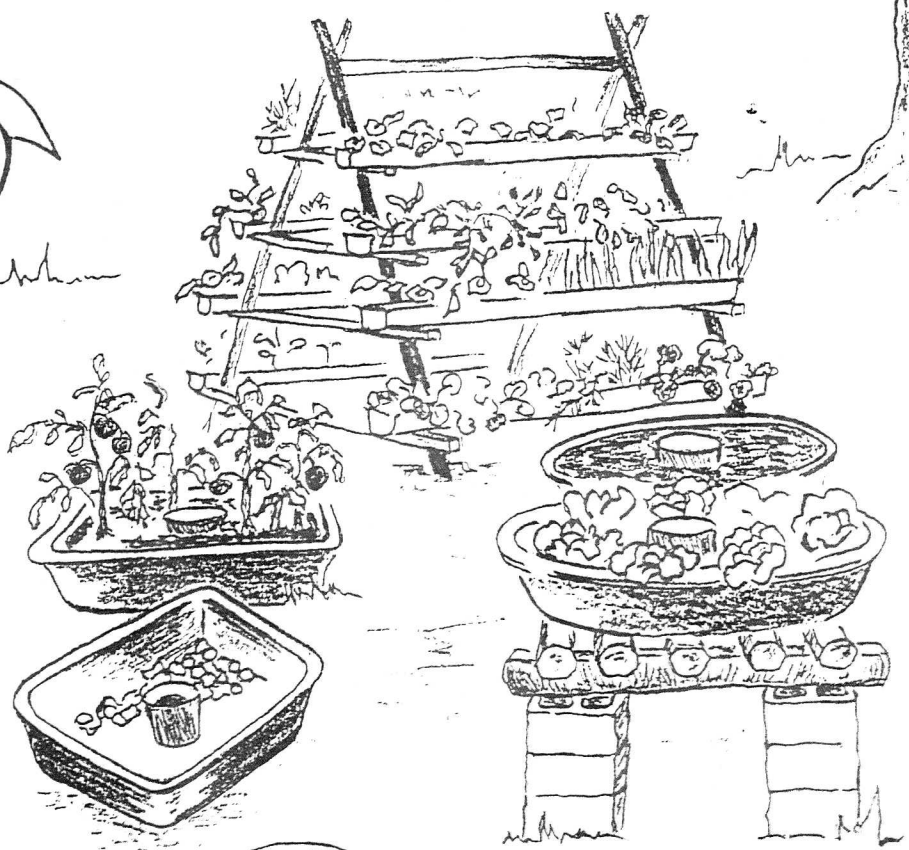


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The No-Till Garden



a Gardening Hint

ECHO
Educational Concerns for Hunger Organization

NO-TILL GARDENING

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I first read of No-Till gardening in *Organic Gardening* magazine, in March of 1981. The article was called "Tossing an Instant Garden." My reaction was that there must be something wrong with anything so easy or everyone would be using it. Because our garden has performed exceptionally well with so little work using this method, that we have now converted all of our growing beds to this system.

Ruth Stout first popularized the No-Till method in her book *No Work Gardening* published by Rodale Press. Every spring she had to wait on her garden until her husband could leave the fields long enough to get it plowed. One year, early in the spring, while getting the garden ready for plowing, she moved a small stack of hay. Where the hay had been there was no need to plow. From that time on, her garden had at least a 6-inch layer of mulch year-round. At the appropriate seasons she simply removed the mulch and planted. She no longer had to wait to have it plowed.

No-Till gardening is even more relevant to urban and suburban gardeners today. Some communities will no longer haul yard waste to the landfill. Even a modest garden can accommodate all the grass clippings from your own yard and probably your neighbor's yard as well.

The First Season

ECHO began its first No-Till garden in 1981. It was in continuous production for years until a different demonstration went into the spot. We chose an area of healthy lawn. By the end of the day it was a vegetable garden. It was never plowed, cultivated, spaded or hoed.

Initial preparation of a garden at a new site will involve some steps that will not be necessary in subsequent seasons, unless you fall behind and weeds take over.

Begin by collecting a pile of newspapers well in advance of the day you will make the garden. If it is in lawn or weeds, mow closely with a lawn mower. Chose a day without much wind so the newspapers will stay in



ECHO's First No-Till Garden

place while you work with them.

Spread a layer of newspapers over the area. They should be no less than three sheets thick and well overlapped at the edges. On top of the newspaper place whatever organic materials you have chosen for the mulch. We use either wood

chips that are given to us by the power company, or grass clippings. You could experiment with other materials that may be available to you such as hay, straw, tall-cut grass, leaves, pine needles (we had expected problems from pine needle acidity, but they never materialized), and others.

Sometimes we have used corn cobs. These work well, but walking on them is a challenge.

How Thick Should The Mulch Be?

Remember that the farther a weed must grow through the mulch before it reaches light, the weaker it will be to pull and the greater the chance it will not survive at all. In general, light, fluffy materials like straw or new grass clippings must be piled higher than dense materials like wood chips. There is no hard-and-fast rule. As a starting point, use 6 inches of fluffy grass clippings and 3 inches of wood chips.

The weeds or grass underneath the newspaper will still be very much alive for a few weeks. Then they will die from the lack of sunlight. Normally, they will not be able to push their way up through the sheets of newspapers and the layer of mulch.

Pull the mulch away from the spots where you want your vegetables or flowers, exposing the newspaper. Next, a small mound of earth is placed on top of the newspaper. Use a narrow row of soil at least 1 inch thick if the seeds are small and need to be planted closely together. Finally, the seeds or transplants are placed in the soil.

Hint: you might want to use potting mix if you suspect that soil diseases may be present that would harm what you are planting.

The mulch is then moved back against the planting dirt. Also, put a very thin layer of mulch on top of the planting soil so that it will prevent drying. Although the weeds cannot force their way through the newspaper and mulch, the plant's roots will soon grow out of the planting dirt and grow through the wet newspaper.

Until the plants begin growing, they must be watered more frequently than if they were planted in the tilled soil of a regular garden, because the thin layer of soil can dry out quickly. When we pulled mature plants at the end of the first season we found that some roots had grown through the paper and others had grown along the top of the paper to the first edge, then gone underneath for normal growth.

Transplants do surprisingly well when simply planted into the sod through a hole cut in the paper. Pull the mulch back up around the stem as much as possible.

Subsequent Seasons

The newspaper procedure is for the first season only. Before the first season is over, you will find that the newspaper and the sod have decayed and turned to compost. Additional compost is slowly formed as the mulch itself decays and is replaced. If you keep a layer of mulch about 6 inches thick over the established garden, the soil beneath will be ready to plant whenever you wish. To plant a row of beans, for example,

just push the mulch aside to expose the row. Underneath you will find beautiful organic matter waiting for your seeds.

We use the word No-Till because it is analogous to the commercial system of farming where herbicides are used just before planting, then seeds are planted directly into unplowed sod. However, this No-Till gardening is a more organic method, using no herbicides.

Advantages

(1) Gardens can be started anywhere without the need to plow or spade. You can plant in areas that would be difficult to plow, such as around dead trees or in rocky soil. Grasses and other weeds are better controlled than if the ground had been cultivated.

(2) There is much, much less work involved controlling weeds. But *it is a No-Till, not a no-work, garden!* You spend a lot of time gathering and placing the mulch periodically around the plants. Some weeds will still come up and must be removed. They are usually weakened by the tough time they had living under the mulch and tend to be easier than most weeds to pull. As the mulch decomposes you will need to keep replacing it.

(3) Less water is needed for irrigation. The soil will remain moist much longer because the mulch protects it from the drying effects of both sun and wind.

(4) The soil is kept cooler. This can be a disadvantage, however, for colder areas or early spring gardens. Plan ahead, especially early in the season when low-soil temperatures are most likely to be a problem. Rake back the mulch in the area selected for early plantings to allow the sun to strike the soil directly. The soil under the mulch, in an established No-Till garden, should be dark in color and warm up in several days.

(5) Soil moisture and temperature are more uniform, an advantage for most plants.

(6) Nematodes, a serious problem in southern Florida, will be kept under some degree of control, but probably not be eliminated. The soil

conditions found under the mulch layer are much less suited to nematode growth than, for example, the hot, dry sand found in our area. Furthermore, some fungi found in the decaying organic matter will kill nematodes. Using normal gardening techniques, it is almost impossible to grow nematode-susceptible vegetables in the same plot for more than one season in South Florida without the heavy use of chemicals to control them.

(7) There is only need for a small compost pile to put large or diseased plants or weeds in. When the mulch decays, it is automatically compost and is already in place! Earthworms will soon help carry organic matter down into the soil.

(8) Yard waste can immediately be put to use in the garden. Grass clippings and leaves make great mulch. For some of you, the local landfill will not accept yard waste. Materials that are not too thick can actually be placed under the mulch. The moist environment speeds their decay. *For larger materials, see our gardening hint, "Hill Culture".*

(9) Soil erosion from sloping land should be less of a problem.

Disadvantages

We have found few disadvantages; in fact our entire farm now uses this method.

The greatest disadvantage is the danger of frost damage. A thick, dry layer of mulch is such a good insulator that very little heat is radiated to the leaf from the soil. So plants over the mulch tend to frost at higher air temperatures than do plants in the rest of the garden. One year I noticed that a pumpkin vine was frosted over the mulch, but untouched where it had outgrown the garden and was sprawling across the grass. If the mulch material will absorb water, it is helpful to thoroughly wet down the mulch on the afternoon before a threatened frost. If the plants are small and the mulch thick and fluffy, you can get great frost protection by mounding the mulch temporarily over the tops of the plants.

Although it is hard to imagine this being a problem in normal gardening use, it should be mentioned that a very thick, dense layer of mulch can prevent air from entering the soil. We asked a company that mowed for condominiums to dump their grass clippings at ECHO. The site we selected was near the base of three pine trees. Soon grass piles were 4 feet high and several feet wide. Within a few months the trees were dead.

Some Additional Considerations

We periodically add a fertilizer with complete micronutrients to our garden. This is necessary in our sandy soil and high rainfall. If you wish to use completely organic methods, remember that you have a mulched garden but not a composted one until at least one season has passed and the mulch has had time to decay. We have not had problems with acidity in spite of all the wood chips that we use. If this becomes a problem, you would need to use lime.

Will Nitrogen Deficiency Be A Problem?

At first thought you might think so because of all the undecomposed organic matter you are adding. As you may know, incorporating into the soil fresh organic matter with a lot of carbon and little nitrogen can actually harm plant growth the first season. The reason is that microorganisms use up all available nitrogen in the process of decaying the fresh material. This nitrogen will become available again later when the microorganisms die, but it presents a short-term problem.

The No-Till garden does not have this problem because the mulch is not incorporated into the soil. All of the decay is taking place above-ground. There is no way for microorganisms growing in the mulch to remove nitrogen from the soil. Once the mulch is decomposed it is incorporated slowly into the soil by leaching or by mechanical mixing during the planting process and by earthworms.

We have had no unusual problems with insects or other pests. There is always the possibility that in your area there will be some pest that will find the mulch an ideal home and may give you problems.

People often ask if inks on the newspaper will add toxic heavy metals.

We have researched this, and it seems that U.S. printers no longer use inks which contain these metals. Since such a small amount of newspaper is used, and that only once, we consider newspaper ink to be perfectly harmless.



I believe that the No-Till gardening method may give you far better gardens with much less work. Some ECHO visitors who could no longer garden because their health prevents the heavy work of soil preparation are gardening with the No-Till method. But as with nearly everything that we suggest, it is presented as an idea with which you can experiment under your conditions. Only you can evaluate its potential for your area.

We will be very interested to learn of your successes or problems with it. So let us hear from you. We probably will not have time to send a personal response, but you can be sure we will eagerly read your

comments and add your experience to our own body of knowledge. Maybe you can even send us a picture of your No-Till garden.

One final note. You have heard it said that there is nothing new under the sun. A graduate student at Purdue University studied farming methods of early Mayan indians. He discovered that Mayan farmers spread banana leaves over the land to retain soil moisture and keep out competing weeds. Planting was done through individual holes dug through the banana-leaf mulch!!! Sound familiar?

Happy Gardening!

The ECHO Garden Hint Series

A collection of publications designed to share some of ECHO's innovative gardening techniques.

- * Shallow Bed Gardening
- * Hill Culture
- * Using Cola Cans in Your Soil Mix
- * Growing Wick Gardens
- * The Wading Pool Garden
- * The Eave Trough Garden
- * The No-Till Garden

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