No-Till Gardening

ECHO Inc.

I first read of this method of gardening in Organic Gardening magazine where it was referred to as permanent mulch gardening. My reaction was that there must be something wrong with anything so easy or everyone would be using it. But our garden has performed so 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 this method in her book No Work Gardening (Rodale Press, $9.95). She noticed that under a small stack of hay that she removed in the early spring, there was no need to till the ground. From that time on, her garden had at least a 6 inch layer of mulch 12 months of the year. At the appropriate seasons she simply removed mulch from a row or spot for a transplant, and planted.

The first season. We began our no-till garden in September of 1981. It has been in continuous production since then. It was an area of well-grassed lawn. To this day it has never been plowed, cultivated, spaded or hoed. The first season it is necessary to do some extra steps if you are to start with an uncultivated area like we did. It is described in the March 1981 issue of Organic Gardening in an article by Jamie Jobb called "Tossing an Instant Garden". (ECHO will send a copy of this article to overseas development workers who request it.) A layer of newspapers is spread over the area. They should be no less than 3 sheets thick and well overlapped at the edges. Then organic materials of any kind are placed on top. We use either chipped wood that is given to us by the power company when they trim along the power lines, or grass clippings. You could experiment with other materials that may be available to you such as rice hulls, sugar cane bagasse, tall cut grass, leaves, coffee pulp, etc. The method works because weeds are not able to push their way up through newspapers and a layer of mulch, but roots can go down through wet newspaper. Wherever a seed is to be planted a small mound of earth is placed on top of the newspaper (or a narrow row of soil about one inch thick is used if seeds are small and to be planted closely together). The mulch is then pulled back against the earth and a thin layer put on top of it to prevent drying of the soil. The seeds must be watered more frequently than
when planted in tilled soil 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 gone 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.

Subsequent seasons The procedure with newspapers is for the first season only. Before the season is over you will find that the newspaper and the sod have decayed and turned to compost. From then on if you keep a layer of mulch about 6 inches thick over the area, the soil beneath will be ready to plant whenever you wish. Our garden has been in continuous use since the day it was first planted. We use the word "no-till" because it is analogous to the system of farming by the same term where herbicides are used just before planting, then seeds are planted directly into unplowed sod. However, this is a more"organic" method, using no herbicides.

What are the advantages? (1) Gardens can be started in any area without the need to plough or spade. You can plant in areas that would be difficult to plough, 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 in controlling weeds. But it is a no-till, not a no-work, garden! It can take a lot of time gathering and placing the mulch periodically around the plants. And some weeds will come up that must be removed. (3) Less water is needed for irrigation. (4) The soil is kept cooler. This can be a disadvantage, however, for colder areas. If soil temperatures are too low, the mulch can be raked back in areas to be planted a few days before planting, so that the sun can strike the soil directly. The soil will be dark after a few months of no-till gardening and should warm up quickly.(5) Soil moisture and temperature are more uniform, an advantage for most plants. (6) Nematodes will likely be kept under control. The soil environment is 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. We have had some signs of root knot nematodes in the no-till garden, but they have not been a problem after the first few months of operation. It is almost impossible to garden in the same plot for more than one season here without the heavy use of nematicides with normal gardening techniques. We have not yet had to use any nematicide. (7) the only need for a compost pile is for a small one to put large or diseased plants or weeds. 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) Soil erosion from sloping land should be less of a problem.

We periodically add a fertilizer with complete micronutrients. 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.

At first thought you might think that we would run into a nitrogen deficiency by adding so much undecomposed organic matter. As you probably know, adding a lot of fresh organic matter with a lot of carbon and little nitrogen can actually harm plant growth the first season. The reason is that the micro-organisms use up all available nitrogen in the process of decaying the rest of the material. This nitrogen will become available 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. So 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, 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 to be an ideal home and may give you problems. People often ask if inks on the newspaper will add toxic heavy metals. Such metals are only found in colored print. Anyhow, such a small amount of newspaper is used, and that only once, that we consider it 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 for health reasons 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. It should certainly be thoroughly tried before introducing it into the community. We will be very interested to learn of your success or problems with it. Please let us hear from you if you try it.

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!!!

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