

To Till or Not to Till

By Kathy Wolfe

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Consider garden needs before choosing

Our beautiful fall has extended the life span of the Discovery Garden vegetable areas past our wildest dreams. We have enjoyed a long and bountiful harvest, as many of you have. But now with frost's fingers withering our plants and flowers, we can postpone garden clean up no longer. It is time to prepare for winter. The question arises: To till or not to till?

Two techniques are used in late fall in the Discovery Garden to put different areas to bed. The Dig-It program, which uses the tilling method, hosts elementary age school classes in the spring for planting, exploration, crafts and garden knowledge. All planting is done by the children in May. At tilling time in the fall, weeds and crop residue are plowed back into the soil to decompose over the winter into organic matter. The main reason the Dig-It garden uses this system is because so many little feet have trampled on and off the paths, compacting the soil and diminishing its integrity. Working in compost and aerating the entire area allows for better rain and nutrient penetration and the psychological benefit of clearing the slate from one year to the next allows for some gardener satisfaction until the next classes come through the following year.

Tilling can certainly be a viable method of soil management. If you have sticky clay soil or heavily compacted soil, adding an abundance of organic matter such as leaves can be very beneficial. When limestone or sulfur is needed for a quick change in soil acidity, tilling it in will speed up the process because these materials move slowly through the soil. By tilling to different depths each year you can avoid the formation of the hardened layer known as plowpan that compromises natural soil layering and water absorption. Delineating paths in the garden and staying off planted portions also helps keep the soil from compaction.

On the other hand, the vegetable patch grows plants throughout the year in many of its beds. Tilling the entire area in the fall did not allow for any overwintering of crops. Waiting to till in the spring sometimes led to not getting the job done until June due to the wet, clay-based soil. We decided to use three foot wide raised beds without structural frames and surrounded by walking paths for easy access. Every fall, thick layers of compost mulch are top dressed onto the beds after removal of debris and weeds. Water, worms, voles and other creatures move this layer down into the soil. This technique has allowed us to plant much earlier in the season, weed and harvest easily and keep the soil's natural integrity without compaction while also protecting the overwintered crops.

While some profess that tilling kills existing weeds, it also stirs to the surface seeds buried within the soil that then germinate and grow. Weeds are more easily managed with mulch, a sharp hoe or a weeding fork and strong arm.



Once the crops are harvested and the weeds removed, the raised beds are ready for compost to be added to each bed. Master Gardener's Ruth Sutton and Kathy Wolfe share the responsibilities of the Vegetable Garden, along with other volunteers. *Photo credit: Christine Farrow*

At the Discovery Garden we use compost from our abundant compost bins, but other materials are commonly used for mulch. Grass clipping (taken before the plant goes to seed), newspaper (avoid heavy paper and colored inks and cover with soil or other mulch so it does not blow away), straw, seaweed (adds trace minerals and deters slugs but should be applied liberally because it shrinks considerably when dry), and leaves (a valuable source of carbon, but apply in thin layers to avoid matting, and sprinkle with soil so they will stay in place) all add organic matter to build soil structure.

Because most plants' roots are on the surface, where aeration and biological activity are more prevalent, deep fertilization is of little benefit. Leaving the soil undisturbed has the advantage of promoting natural aeration and drainage from the worms and other soil dwelling creatures that leave excretions which bind together soil crumbs. Channels left by dead roots and the alteration of freeze/thaw cycles also help natural soil aeration. These soils are said to be freer of pests and disease, possibly due to a more balanced soil population which can build up in an undisturbed environment, and thus encourage the buildup of beneficial soil fungi.

The addition of thick layers of mulch allows water to pass through easily while shading the soil; this reduces water lost to evaporation and helps to maintain a moist, spongy growing environment, thereby benefiting young, early root growth. Worms thrive in this environment as well. Charles Darwin, in his last book, *The Formation of Vegetable Mould Through the Action of*

Worms, and Observations of Their Habits, determined that earthworms turn over the top six inches of soil every twenty years. Carbon-enriched humus and decaying organic matter in healthy topsoil nurture plants. Tilling the soil speeds breakdown of organic matter, so nutrients can be released too quickly rather than in a steady and slow way that benefits most plants over a longer period, which is most helpful for growing our vegetables over the extended season. These are many of the reasons we use the no-till method in the vegetable patch.

To till or not to till in your own garden? You have options. Evaluate the circumstances and decide for yourself.



Left: A layer of chopped leaves spread onto a freshly tilled garden will break down slowly throughout the winter and can be worked more deeply into the soil in the spring. **Right:** In the vegetable garden, the plants that will not over winter are removed from the raised beds and composted. *Photos by Christine Farrow*

RESOURCES:

- “Mulch is A Key to No-Till Gardens,” Tiffany Woods, Oregon State University Extension
- “No-Till Garden Beds Save Time and Labor,” Davi Richards, Oregon State University Extension
- “Tilling is One Chore You Might Be Able to Skip,” Lee Reich, Fine Gardening Magazine
- “No-Till: The Quiet Revolution,” David R. Huggins & John P. Reganold, Scientific American 2008
- Agricultural Research Service
- U.S. Department of Agriculture
- University of Minnesota Extension