



OPINION | LEILA PHILIP

Nurturing life, from the soil up



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Tomatoes in a greenhouse at Long Wind Farm in Thetford, Vermont.

By Leila Philip

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I back slowly out of my garden, trying not to do any more damage than I have already done. I had been so eager to get a jump on the season and start this long-awaited ritual of spring. For days, my starts of tomatoes and zinnias, cucumbers and marigolds, had been lined up by the garage. When sun finally broke through a week of rain, I rushed home from work and headed out into a world of sudden, hopeful, glowing green and heat.

New England gardeners know to wait to plant the bulk of their vegetable garden until about Memorial Day weekend, because only then is the danger of frost finally (usually!) over. In a few days, I'll walk to the town center to watch the straggling parade. Members of the local chapter of Veterans of Foreign Wars will assemble. There will be a speech. A local brass band will play, then the taps will sound their stark haunting tribute. I will think of my own father's military service as a Marine in World War II. He would survive Iwo Jima, returning with a bullet hole in his helmet, a Purple Heart, and a passionate belief in democracy and ethical business as the pillars of the free world. Eventually, my father would leave his prosperous career to further transform my family's farm into a commercial fruit orchard.

My father's postwar generation of farmers emphasized the use of pesticides and chemical fertilizers to increase production. What these methods ignored was the need of the dirt itself. Today, we understand the cost of these practices, not only for the larger environment, but in terms of what farmers, politicians, and environmental historians loosely call soil exhaustion. After decades of these conventional agricultural practices, soil health declines; it [also begins to erode](#) and literally blow or wash away. Globally, [we lose an estimated 24 billion tons of topsoil](#) annually.

AS SOON AS my shovel cut into the dark earth, I realized my mistake. When I pulled it out, a sodden mass of dirt clung to it before dropping with a heavy thud. I looked down at my footprints, each a deep indentation. My garden soil was too wet. Even a handful of topsoil contains billions of microbes, key to plant health, which need oxygen to survive. Healthy soil is 25 percent oxygen, and too much water compacts the soil, literally pushing the oxygen out, which suffocates the soil organisms. Digging soil when wet, or even walking on it, compounds the problem. I knew to add compost to my vegetable bed, but a year ago I would have continued turning it over, thinking I was aerating it for the better. That was before I began learning about [regenerative agriculture](#), a new approach to farming that increases biodiversity through a set of practices that work to build healthy soil.

Soil is actually a dynamic interface between the rock that makes up our planet and the plants and animals (like us) that live off of sunlight and the nutrients leached out of those rocks. And it is the organisms that live in soil that enable plants to thrive: bacteria, fungi, protozoa, nematodes, mites, springtails, and yes, nature's plow, the earthworm. These organisms and

more, collectively called “soil life,” feed on organic matter in the soil and help convert it, along with soil minerals, into the vitamins, hormones, disease-suppressing compounds, and nutrients that plants need to grow. In return, plants exude carbohydrates from their roots that the microbes use to survive. The soil is a biome and, over time, it creates a complex structure of air spaces and tiny channels for water to flow. When you till the soil, you introduce oxygen in the short term, but destroy the natural structure of the soil, leading among other things, to less aeration over time.

Regenerative agriculture reverses cycles of soil abuse and environmental degradation (and sequesters carbon) by working with natural processes. Methods include reducing the disturbance of the soil; planting for diversity instead of monoculture; avoiding pesticides and simple fertilizers, which help plants only in the short term; and not leaving soil bare, because that increases the breakdown of organic matter, water erosion, and the release of carbon. Small farms across the country have begun implementing these practices with economic success. Home gardeners can make a difference by working to improve soil health in their own backyards instead of depending on pesticides and chemical fertilizers.

In his own era of agriculture, my father was a pioneer, becoming the first Hudson Valley fruit grower to fully implement a pick-your-own model of harvesting. If he were alive today, I’m pretty sure he’d be reading everything he could find about new methods like regenerative agriculture. By gardening to improve the soil, I won’t be able to plant when I wanted to, but at least I’ll know that my plants, and more, can thrive.

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