THE SOIL WILL SAVE US

In “The Soil Will Save Us: How Scientists, Farmers, and Foodies are Healing the Soil to Save the Planet” (2014), Kristin Ohlson argues that healthy soils can protect us from drought, prevent floods, sequester carbon, increase biodiversity, stop erosion, reduce pollution, clean up air and water, yield healthier food, and benefit birds and other wildlife.

Yet farmers on only a tiny fraction of U.S. soils practice improving and enriching those soils, though both production and profits increase once they make the transition.

Why should this be? The short answer is that “regenerative farming,” as Ohlson calls it, avoids tilling vast acreages, using heavy equipment, and massively applying pesticides and fertilizers. Thus it promises no big profits for industrial agriculture.

The fields you’re likely to see along the freeway have probably been scraped bare after harvest, to prevent weed and pest buildups, and will remain bare all winter. Then, in spring, they’re plowed, perhaps with a huge machine, deeper every year as the soil compacts, and maybe spread with an initial dose of herbicide. Once they’re seeded, they’re repeatedly fertilized. Because compacted soil can’t absorb water, most of the fertilizer runs off, going on to pollute waterways and the ocean.

None of that enriches the soil; instead it treats the soil like dirt, something we've been doing for too long.

Take plowing, for instance. As one of Olhson's informants says, "Nothing in nature repeatedly and regularly turns over the soil to the specified depth of 15 to 20 centimeters." In other words, neither plants nor soil organisms have evolved to deal with plowing.

Though far fewer humans lived 200 years ago, their ecological footprints were bigger. Humans have created several deserts, including the Sahara, through bad agricultural practices. And 75% of global deforestation occurred before 1850.

When left bare for months, Ohlson says, soil's full panoply of nutrients will never manifest. Plant roots fed chemical fertilizers no longer need to attract microorganisms to nourish themselves.

Allowing cattle and other browsers to eat plants down to the roots prevents photosynthesis, by far the most massive carbon sequester of all.

As a result of industrial agriculture's practices we've already lost 50-80 percent of the soil's carbon.

To reverse this trend, we need to know how healthy soils function, and promote regenerative agricultural practices.

Plants' roots send out sugars to lure microorganisms' help in feeding themselves. Besides providing food, these microorganisms protect roots from predation and create aggregates which hold water like sponges. Once established, it's a largely self-renewing and self-regulating process.

As above, so below – plant diversity promotes insect and animal diversity above, and rich microbial diversity below.

To revive exhausted soils, farmers and ranchers use no-till, cover crop cocktails and mob grazing. No-till avoids plowing and preserves the soil's life web, by planting seeds directly into the debris of last year's crop; cover crop cocktails promote biodiversity and keep photosynthesis going between seasons; and mob grazing – moving cattle and other browsers quickly through pastures -- fertilizes and stimulates new growth.

Ohlson says that rather than scientists, it's mostly farmers and ranchers, who have found it pays off, who are trying out regenerative agriculture. There are no fertilizer or pesticide corporations to fund the research.

One private study compared regenerative and industrial agriculture over 30 years. The study found that regenerative agriculture improved the soil, suffered fewer pests, produced more, was more drought tolerant, and 3 times as profitable.

One scientist Ohlson quotes says we could offset all current CO2 emissions by sequestering carbon, through regenerative agriculture, on 11 million acres of idled land.

But, Ohlson objects, won't saying that invite polluters to pollute even more?

Perhaps not. She finds hope in the growing cooperation among age-old antagonists – farmers and environmentalists, working together on the premise that the soil will save us.