



Healthy soil is the real key to feeding the world

David R. Montgomery

Part 1

One of the biggest modern myths about agriculture is that organic farming is inherently sustainable. It can be, but it isn't necessarily. After all, soil erosion from chemical-free tilled fields undermined the Roman Empire and other ancient societies around the world. Other agricultural myths hinder recognizing the potential to restore degraded soils to feed the world using fewer agrochemicals.

When David embarked on a six-month trip to visit farms around the world to research his book, "Growing a Revolution: Bringing Our Soil Back to Life," the innovative farmers he met showed him that regenerative farming practices can restore the world's agricultural soils. In both the developed and developing worlds, these farmers rapidly rebuilt the fertility of their degraded soil, which then allowed them to maintain high yields using far less fertilizer and fewer pesticides.

Their experiences, and the results that David saw on their farms in North and South Dakota, Ohio, Pennsylvania, Ghana and Costa Rica, offer compelling evidence that the key to sustaining highly productive agriculture lies in rebuilding healthy, fertile soil. This journey also led him to question three pillars of conventional wisdom about today's industrialized agrochemical agriculture: that it feeds the world, is a more efficient way to produce food and will be necessary to feed the future.

Myth 1: Large-scale agriculture feeds the world today

According to a recent U.N. Food and Agriculture Organization (FAO) report, family farms produce over three-quarters of the world's food. The FAO also estimates that almost three-quarters of all farms worldwide are smaller than one hectare – about 2.5 acres, or the size of a typical city block.

Most food consumed in the developing world is grown on small family farms. Only about 1 percent of Americans are farmers today. Yet most of the world's farmers work the land to feed themselves and their families. So while conventional industrialized agriculture feeds the developed world, most of the world's farmers work small family farms. A 2016 Environmental Working Group report found that almost 90 percent of U.S. agricultural exports went to developed countries with few hungry people.

Of course the world needs commercial agriculture, unless we all want to live on and work our own farms. But are large industrial farms really the best, let alone the only, way forward? This question leads us to a second myth

Myth 2: Large farms are more efficient

Many high-volume industrial processes exhibit efficiencies at large scale that decrease inputs per unit of production. The more widgets you make, the more efficiently you can make each one. But agriculture is different. A 1989 National Research Council study concluded that "well-managed alternative farming systems nearly always use less synthetic chemical pesticides, fertilizers, and antibiotics per unit of production than conventional farms."

And while mechanization can provide cost and labor efficiencies on large farms, bigger farms do not necessarily produce more food. According to a 1992 agricultural census report, small, diversified farms produce more than twice as much food per acre than large farms do.

Even the World Bank endorses small farms as the way to increase agricultural output in developing nations where food security remains a pressing issue. While large farms excel at producing a lot of a particular crop – like corn or wheat – small diversified farms produce more food and more kinds of food per hectare overall.

To be continued

Farming Secrets says: Are regenerative farming practices proving both productive and economical? The farmers that David met show us they already are.

Ref: David R. Montgomery Professor of Earth and Space Sciences, University of Washington