

Organic Farmers: Growing America's Health

Restoring the Nutritional Value of Crops

by Melinda Hemmelgarn

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When we think of scientists as men and women in lab coats peering into microscopes, what's missing is farmers. Our society doesn't tend to equate the two, yet farmers are active field scientists. How they choose to grow and produce food greatly impacts our shared environment of soil, water and air quality, as well as the nutritional content of food, and therefore, public health.

The best field- and lab-based scientists share key traits: they're curious, keen observers and systems thinkers that learn by trial and error. Both formulate and test hypotheses, collect data, take measurements, assess results and draw conclusions.

Field Science

Diana Dyer, a registered dietitian and organic garlic farmer outside of Ann Arbor, Michigan, explains, "I like to help people see the similarities between the scientific process and good, careful farming—all

aspects of which revolve around observations, goals, planning, implementation, intervention and analysis of results—then careful re-planning based on those results."

Dyer and her husband, Dick, started farming after long careers in traditional health care, where the focus was on treating people after they got sick. Through their farm work, they wanted to focus on prevention. "Growing healthy food in healthy soil, our goal was to create and nourish a healthy community from the ground up. Communicating the multiple benefits of healthy soils and ecosystems has been at the core of our vision and responsibility from day one," she says. The Dyers believe that flavor is key to eating and enjoying truly nourishing foods, and based on their professional health backgrounds and farming experience, they connect healthy soil with higher-quality, better-tasting food.

In Havre, Montana, Doug Crabtree,

and his wife, Anna, manage Vilicus Farms, featured in the book *Lentil Underground: Renegade Farmers and the Future of Food in America*, by Liz Carlisle. The Crabtrees grow organic heirloom and specialty grains, pulses and oilseed crops such as emmer, kamut, black beluga lentils and flax.

Asked if he considers himself a scientist, Crabtree first defines the term as "a person who is studying or has expert knowledge of one or more of the natural or physical sciences." Then he replies, "Given this definition, how could any farmer not be a scientist? An organic farmer is a lifelong student of nature, seeking to emulate her wisdom and processes as we refine our production systems. Organic production isn't just growing food without toxic chemical inputs, it's a system that requires conscientiously improving soil, water and associated resources while producing safe and healthy food for America's growing population of informed consumers."

Healthy Soil, Food and People

At the Rodale Institute, in Kutztown, Pennsylvania, Andrew Smith directs the new Vegetable Systems Trial, a long-term, side-by-side comparison of both biologically organic and chemically based conventional vegetable production. An organic farmer with a Ph.D. in molecular ecology from Drexel University, in Philadelphia, Smith studies how soil quality and crop-growing conditions influence the nutrient density and health-protecting properties of specific vegetables.

“Over the past 70 years, there’s been a decline in the nutritional value of our foods,” reports Smith. “During this time, industrial agriculture, with its pesticides and synthetic fertilizers, increased yields and size of crops, but the tradeoff was a decline in nutrient content, known as the ‘dilution effect.’” In addition, Smith explains, greater levels of nitrogen fertilizer, typical of conventional production methods, may also increase a plant’s susceptibility to insects and disease.

Smith’s research will give fellow farmers, healthcare providers and consumers a better understanding of how crop production practices influence soil quality and therefore, food quality. For example, research of organic crops shows higher levels of vitamin C; higher-quality protein; plus more disease-fighting compounds called secondary plant metabolites such as lycopene, polyphenols and anthocyanin, the plant pigment responsible for the red, blue and purple colors in fruits and vegetables, as reported in a meta-analysis published in the *British Journal of Nutrition*.

The Rodale Institute has formed partnerships with nutrition and medical researchers at Pennsylvania State University, in University Park. Of particular interest, for example, are extracts from purple potatoes that show promise in helping to kill colon cancer cells. Smith looks forward to identifying growing methods that boost levels of anthocyanin, as well as other health-protecting compounds in crops.

The new Regenerative Health Institute, a global research and education center linking soil health to human health, will also be housed at the Rodale Institute.

It’s a collaboration between Rodale staff and the Plantrician Project, a nonprofit organization in New Canaan, Connecticut, that promotes whole food and plant-based nutrition, and helps healthcare providers embrace food as medicine as the foundation of their practices.

Jeff Moyer, a renowned international authority in organic agriculture and executive director of the Rodale Institute, explains, “It’s not only what you eat that’s important, but how what you eat was produced. Ultimately, our personal health is linked to the health of the soil.”

David Montgomery, a professor of geomorphology at the University of Washington, in Seattle, has visited farms worldwide, witnessing how farmers use regenerative farming practices to bring degraded soil back to life. He learned that grazing animals, cover-cropping and no-till farming free of synthetic chemical fertilizers and pesticides protects and enriches the soil microbiome, which contributes to the nutrient density of plants and human health.

We Are What We and Our Animals Eat

Along with our well-being, livestock farming methods impact our environment, too. A growing body of research including a new study published in *Food Science & Nutrition* shows that meat and dairy products from animals raised mostly on grass or pasture—as nature intended—contain significantly higher levels of conjugated linoleic acid and omega-3 fatty acids compared to grain-fed animals. These naturally occurring fats help protect us from inflammation, heart disease and cancer. Important in brain, eye and nerve development, omega-3 fatty acids are especially critical for pregnant and breastfeeding women and their infants.

Organic farmers, by law, must provide their ruminant animals with significant time on pasture and may not feed them genetically engineered feed or feed produced with synthetic fertilizers and pesticides. Further, they can’t use synthetic hormones or antibiotics to promote weight gain. In these ways, organic farmers help protect our food, water, and environment from contamination, and

reduce the growing global threat of antibiotic resistance.

Randolph Center, Vermont, dairy farmers Regina and Brent Beidler diligently study and question changes they witness in their immediate environment. They monitor what grows in their pasture, watch what their cows choose to eat and count the numbers and activities of insects, bees, worms, birds and wildlife. They understand that careful land and animal stewardship is key to soil, plant, animal and human health.

Healing Communities

More hospitals nationwide are investing in farms and farmers’ markets to boost patient, employee and community health by increasing access to nutrient-dense, fresh, healthful food. One exceptional example is the new partnership between Virginia’s Allegheny Mountain Institute (AMI) and Augusta Health, an independent, community-owned nonprofit hospital in Augusta County, Virginia.

The AMI Fellowship program prepares individuals to become farmers, teachers and ambassadors for health-promoting food systems. “Both AMI and Augusta Health believe that access to excellent health care includes access to healthy food,” explains Sue Erhardt, the institute’s executive director.

The AMI Farm at Augusta Health initiative will create an onsite production farm and a community venue for food, nutrition and gardening education. Their goal is to tackle three major local health issues: poor nutrition, low physical activity and overweight; diabetes; and mental health. A Food Pharmacy program for those with or at risk for Type 2 diabetes will provide fresh produce prescriptions at an onsite farmstand, as well as cooking classes.

Erhardt recalls her life-changing experience as a teen, hearing American labor leader Cesar Chavez speak about farm worker exposure to pesticides and related cancer clusters. She’s proud to say, “The farm project will exemplify sustainable practices for growing vegetables, including organic four-season crops and companion planting, while promoting soil health.

“We believe this project will promote a better quality of life for staff, patients and community members.” That’s the power of farming when it’s dedicated to optimum health.

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Quality Food Science Resources

- Allegheny Mountain Institute:
AlleghenyMountainInstitute.org
- Beyond Pesticides Annual Forum presentations: *BeyondPesticides.org*
- *Food Sleuth Radio* current interviews with Andrew Smith and Sue Erhardt:
prx.org/series/32432-food-sleuth-radio
- *Food Sleuth Radio* past interviews with Jim Riddle and David Montgomery:
beta.prx.org/stories/214702;
beta.prx.org/stories/220278
- Grassmilk:
Tinyurl.com/FattyAcidsCowsMilkStudy
- History of soil and human health:
Tinyurl.com/WilliamAlbrechtPapers
- Midwest Organic and Sustainable Education Service: *MosesOrganic.org;*
Tinyurl.com/HealthySeedTechniques
- Regenerative Health Institute:
Tinyurl.com/RHIVideo
- Rodale Institute: *RodaleInstitute.org*
- “Sustaining Life: From Soil Microbiota to Gut Microbiome,”
by David Montgomery:
Tinyurl.com/HealthySoilSustainsLife
- U.S. Food Sovereignty Alliance:
USFoodSovereigntyAlliance.org
- Vilicus Farms: *VilicusFarms.com*