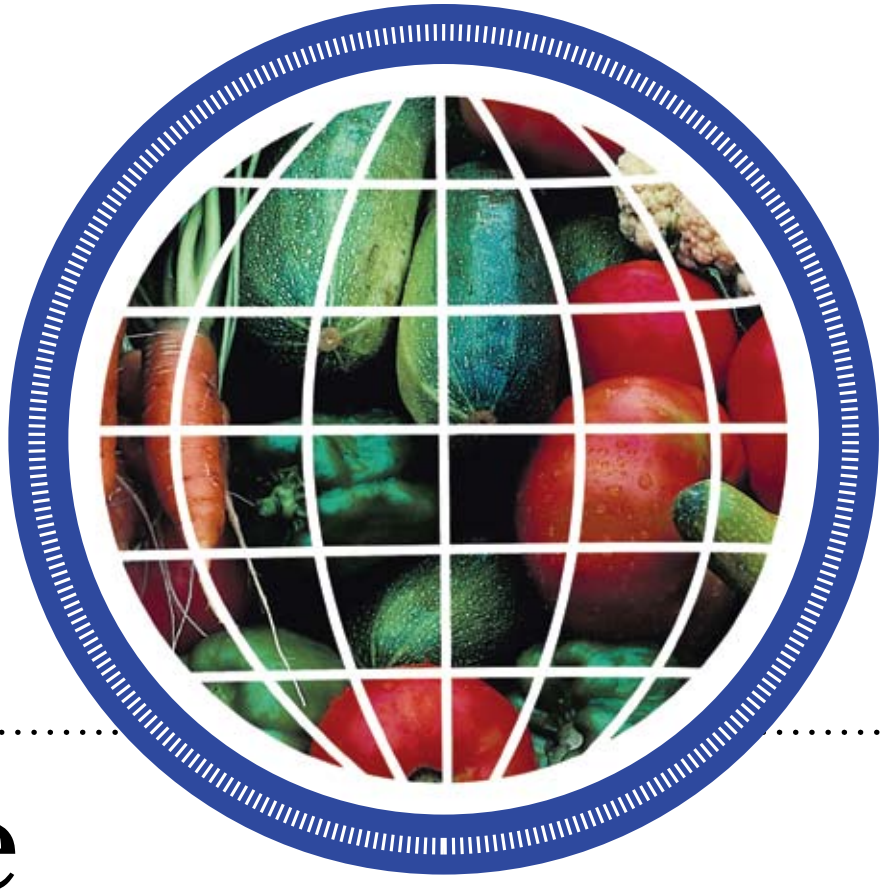


Ecological Agriculture

Can We Feed the World?

by Joel Salatin

"This ecological farming thing, compost, and pastured livestock all sounds nice, but can it really feed the world?" This is by far and away the most frequently asked question I receive.

Even true blue defenders of the ecological/local food approach often exhibit incredulity or at least a twinge of embarrassment about what they espouse. They might say, for example, "I'm sure glad we had chemical farming and petroleum, or half the world would not be here because we could not have fed us all." Even greenies and foodies can be heard saying this, and that's a shame, 'cause 'tain't true. Here's why.

If you visit any living history museum in the Western world set in a time period before 1950, you will not see a compost pile. Plymouth Rock, Williamsburg, the Museum of American Frontier Culture — none of them has a compost pile. Scientific aerobic composting developed and sprang onto the world stage from Sir Albert Howard's research in India from about 1920-1940. His 1943 book *An Agricultural Testament* is still widely fingered as the starting point of the ecological farming movement.

Let's get the story in context. Up until 1900, both the United States and Australia had plenty of new ground to exploit. Although the American colonial period wore out land, the virgin soils of western expansion always offered an alternative. But by the early 1900s, the westward expansion was complete. The Oregon Trail, Oklahoma, everything had been found. "Go west" had expired.

Then along came the dust bowls, John Steinbeck's *Grapes of Wrath,* and a general worldwide paranoia about soil fertility. Many researchers worked on this critical problem, but just like today, they fell into two camps. One camp espoused the simplistic approach popularized by Justus von Liebig that living things were only configurations of nitrogen, potassium and phosphorus. No microorganisms in the soil, no fungi, no molds — just these three elements. Quite a bit of hubris there, I'd say.

The other camp appreciated the complexity of biological systems, and realized that ultimately everything depended on solar accumulation into carbon, and carbon feeding the regeneration cycle. Howard was point man for this camp and gradu-

ally passed his mantle to J.I. Rodale, Ed Faulkner, Louis Bromfield, Newman Turner and others.

Innovation never develops consistently across all the disciplines necessary to metabolize the discovery. A perfect example in today's world is the consternation by tax collection agencies that e-commerce has developed faster than tax policy. The point of the innovation is a spearhead that precedes other related developments. It's always a ragged edge.

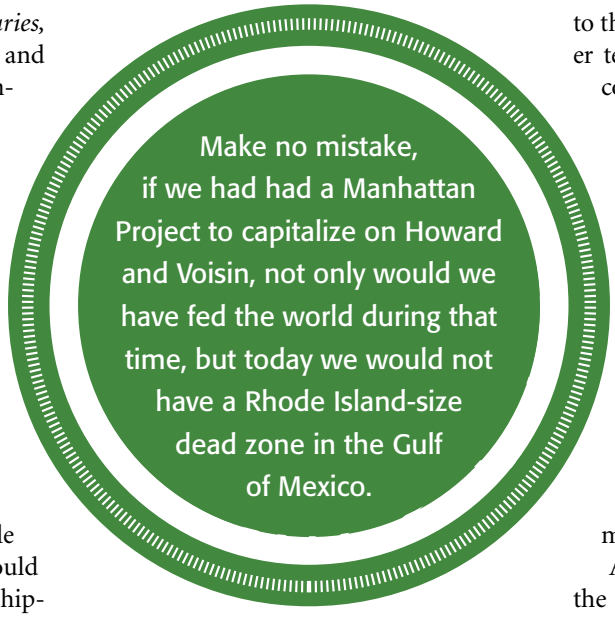
Howard's scientific composting methods developed in India as a natural outgrowth of labor and indigenous understanding. The Far East, as evidenced in the book *Farmers of Forty Centuries,* practiced more sophisticated carbon and nutrient recycling than the West. Another asset Howard had there was labor. By 1920, American urbanization and burgeoning manufacturing facilities were emptying the countryside of farm boys.

Howard's scientific composting required handling copious amounts of sisal and manure. The sisal worked better if it was chopped up. At that time, the equipment and infrastructure to make this shredding and handling efficient at the individual farm scale had not yet been invented. It would be several decades before efficient chippers, hydraulic front-end loaders, shredders, PTO-driven manure spreaders, and compact four-wheel-drive tractors would make Howard's model viable for commercial farmers.

With cheap labor in India, however, Howard developed his prototypes without suffering the withering snubbing of American farmers, who by 1930 were already short of good labor. During this time, too, Andre Voisin in France developed the grazing side of this biological fertility equation. His *Grass Productivity* was first published in 1959. But his piece of infrastructure, yet to be developed to metabolize his discovery, was economical and dependable electric fencing and water pipe. PVC was still several years away. Solid-state and then microchip low-impedence electric fence energizers were decades away.

These great researchers introduced the science and publicized it widely, but did not have the necessary infrastructure to leverage the new information.

Meanwhile, the chemical side was moving ahead full-bore. A worldwide conflagration in the late 1930s and early 1940s focused unprecedented brainpower and economic investment on explosives, which interestingly, were primarily nitrogen, potassium and phosphorus. To win World War II, America spared nothing to develop the chemistry, production and distribution for munitions.



This simultaneous research and development favored the chemical approach. In short, the Pentagon paid for the ancillary and related innovation necessary to metabolize Liebig's NPK discovery and make it widely useful. By the end of the war, the huge and highly profitable munitions companies could take their development, paid for by the war effort, and unleash it on agriculture.

So imagine you're a farmer in 1950. You need to grow a crop. You can either buy a bag of material that's cheap, available, and easily applied in a simple drop spreader or spinner, or you can pitchfork straw, shovel sawdust, mix it with manure, shovel it into a pile, and then shovel it up into a crude ground-driven manure spreader. At the least, you could shovel a static bedding pack into a crude manure spreader. Which would you do? Let's not be too hard on our forefathers.

It's as if in 1950, at the threshold of the industrial economy's golden age and with urbanization in full swing, farmers came to a one-mile track meet, a race to meet the burgeoning demand for food with fewer farmers. The race would be four laps around the track. One side started on the starting line. The chemical side started with a two-lap head start.

It took nearly 50 years for the biological side to self-finance the development of techniques and infrastructure to metabolize what Howard and Voisin brought to the world at mid-century. And for other technical discoveries to be made that could be adapted to carbon handling, water movement, and lightweight, portable electric fencing. Make no mistake, if we had had a Manhattan Project to capitalize on Howard and Voisin, not only would we have fed the world during that time, but today we would not have a Rhode Island-size dead zone in the Gulf of Mexico. We would not have lost half of Iowa's topsoil in a mere 100 years. We would not have degenerated the landscape with three-legged salamanders and infertile frogs.

Add now to that body of knowledge the work of Carey Reams, William Albrecht, Allan Savory, Lee Fryer, Fletcher Sims, Phil Callahan, permaculture, and the Acres U.S.A. hall of fame and our side has not only caught up with the chemical pushers, we're lapping them. We eco-farmers do not have to apologize for anything. We built the knowledge, developed the protocols, paid for the distribution when the USDA pooh-poohed everything we were doing. It still does, assuming that irradiation, genetic prostitution, pasteurization, sterile food, and robotic machines will save us.

Dear *Acres U.S.A.* readers, don't ever let someone disparage eco-farming's place in this ministry to feed the world. And during all this catch-up time, the head start side has spewed pseudo-science to the world in order to maintain an illusion of accomplishment.

For example, let's say the United Nations commissions a study of genetically engineered rice production in Vietnam. Some land grant grad students and their properly credentialed Ph.D. mentor fly over there. Their genetically modified organism (GMO) paddy grows lots of rice. The adjacent one, built on indigenous methods, grows rice, tilapia in the water, ducks that make meat and lay eggs, and around the edges, prodigious bok choy and arugula. But these Western linear, reductionist, compartmentalized, fragmentized, systematized, parts-oriented researchers don't measure the ducks, eggs, fish or edible greens. They went to study rice. And the GMO rice, in a chemical-ized paddy devoid of any other life in or around it, sure grows rice. Conclusion — our side can't feed the world.

I well remember in the 1970s when cow colleges began studying the viability of organics. They took research plots where chemical fertilizers and herbicides had been used for other research and designated some as their organic plots and others as their chemical plots. The organic plots received nothing. The others received the whole chemical alphabet soup. Hybrid corn prospered in the chemical plots and did not fare well in the neglected plots. Conclusion — half the world would starve if we practiced organic farming.

Anyone familiar with biological soil principles knows that once a soil has been abused with decades of chemicals, it takes years for all the life to come back into it and make it fertile. Such research does not even qualify as science, and yet it is the basis for policy and perception worldwide. Bunk. Double bunk.

One of my pet peeves is when people visit Polyface Farm and remark, "This is like they used to do things. Like Grandpa's farm." I have to bite my tongue sometimes. It is *not* like Grandpa's farm. He would have given his right arm to have the infrastructure and sophisticated diagnostic gadgets we have today.

In just ten minutes I can show visitors a dozen things that Grandpa could not have even conceived: computerized, dependable, 1-amp, 10,000-volt electric fence energizers; PTO-powered manure spreaders; hoop houses with UV-stabilized, laminated 15-year plastic; magnetically charged foliar sprays applied while stomata listen to calypso music and open wide for big gulps of biologically-enhanced nutrients; PTO-powered, hydraulically-fed three-point-hitch-mounted chippers that can handle an inch of wood per 10 horsepower; a real biomass accumulator. Wow! And power-steering, four-wheel drive shuttle-shift diesel tractors with automatically leveled front-end loaders. Baby, I'm levitating.

It is *not* like Grandpa's farm. He would have given his right arm to have the infrastructure and sophisticated diagnostic gadgets we have today.

Oh, don't forget 800-pound, 20-horsepower Honda-powered bandsaw mills cheaper than an old used car that puts any farmer in the self-sufficient lumber business. How about polyethylene, stainless-steel filament, built-in fiberglass post netting for poultry, sheep, goats and children. (That was just to see if you were awake.) Good gracious, folks, this farm is nothing like Grandpa's. Electric fence fault-finders and hand-held laser range-finders to pinpoint acreage and paddock allotments.

Many naysayers tell me: "Salatin, I don't want to go back to hog cholera, Marek's disease and brucellosis." The assumption is that the ecological system will re-introduce all those epizootics that plagued agriculture during the dawn of the industrial age. The reason we had so many of those maladies early in the 20th century was because the urbanization and industrialization of the culture preceded hygiene, antibiotics, sanitation, stainless steel, rural electrification, efficient rural concrete pouring, and refrigeration.

Like all innovation, the cities expanded faster than the supporting agricultural knowledge and infrastructure. Animals were overcrowded in filthy conditions without the miracle of drugs. Drugs bought some time. But now we have *C. diff.,* MRSA, and other superbugs spelling the decline of that paradigm. Meanwhile, the ecological farming approach has steadily developed synergistic, symbiotic bio-mimicry. Pasture-based economies of scale utilize these innovative developments in water systems, fencing, and lightweight portable infrastructure. From mad cow to avian influenza to Salmonella, today's litany of maladies and pathogens are new and catastrophic, not to mention obesity and type 2 diabetes. How long do we think we can fool natural principles?

Dear people, our side has not stood still since the 1920s. The advertisers in *Acres U.S.A.* and kindred publications have already solved the pathogen, erosion and fertility problems that the chemical Neanderthals (to use the late iconic Charles Walters' term) are still scratching their heads about. *Acres U.S.A.* readers aren't worried about mad cow disease because we don't feed dead cows to cows. 'Tain't natural.

We don't worry about avian influenza because our chickens are on pasture in uncrowded conditions. We don't worry about erosion because we're building soil. And we don't worry about feeding the world because as we heal our farms and landscape, we see everything get better. Vibrant plants. Gurgling springs. Slick, sleek animals. Healthy, happy customers.

So go out and hold your head up high. Explain our side's slow start and speedy catch up. And now we're blowing them away. Carry on.

Joel Salatin farms in Virginia's Shenendoah Valley with his family. He is the author of several books on ecological, family-scale farming. Polyface Farm has been described in numerous magazines, featured in documentaries, and hosts visitors from around the world. Learn more at *www.polyfacefarms.com.*