



PART I

Farming: An Emerging Paradigm



PAM KLEPPEL

Really, the only two things that any of us have are land and labor.¹

— Carter, Swancy, Riverview Farm, GA

Farming ten thousand acres... they really don't want to be doing that. At that point, you're a manager of some kind...

If a man can't make a living off a couple of hundred acres of good land, the system's broke.²

— Wes Swancy (Carter Swancy's son), Riverview Farm, GA

1

A New Approach to Agriculture

IT'S THREE-THIRTY ON A MONDAY MORNING IN MID-MAY. I'm sitting in a ladder-back chair at the low wooden counter in my kitchen where I keep my farm records, sipping my second cup of coffee and, as on most mornings, working on one of my projects. I use this quiet time each day to analyze data, to prepare lectures for my classes, and to write. Today, I am working on this book. In about an hour-and-a-half, the dogs will come charging down the stairs from our bedroom, ready to begin their day. Pam and I will have breakfast and then I'll head out to the south pasture behind the barn and start pulling up the light-weight plastic fencing that I use to create temporary enclosures, or paddocks, that confine 20 or so ewes and lambs to about a quarter of an acre of land. The sheep have been grazing this quarter-acre for three days, and today I will move the fencing to an ungrazed section of pasture, creating a new paddock full of fresh, clean grass for the ewes and their lambs to feast on for the next three days.

At about the same time this morning, Jim Hayes, after joining his wife Adele for a cup of coffee, will leave his house at Sap Bush Hollow Farm, in New York's Schoharie Valley. He and his border collie will walk in the dim light to a small shed attached to the barn. As Jim opens the door, the amber light from a pair of heat lamps will reveal an explosion of chicks scattering wildly through the wood shavings that cover the shed floor, in a frenzied search for breakfast. In only eight weeks, these tiny birds, each weighing just a few ounces, will check in at five or six pounds and be ready for market. On this morning, Jim will feed the chicks, and then the layers and the hogs, and finally, crossing the road to a paddock in a pasture that

he rents from a neighbor, Jim and his dog will move his sheep down the road to a new paddock, in another rented pasture.

Mark and Kristin Kimball, owners of Essex Farm on the New York side of Lake Champlain, are also at their kitchen table at five o'clock this morning, scheduling the day's activities. Kristin will prepare breakfast for the family and Mark will get the two girls scrubbed and dressed. Mark will then head to the barn and hitch two Belgian draft horses to an ancient cultivator, which after breakfast he will drive to the south fields to prepare the soil for planting.

These farmers, and others you will meet in this book, are smart and well educated (often with Ivy League diplomas and advanced degrees). However, some of their methods — the replacement of tractors with draft animals, for instance — leave “conventional” farmers scratching their heads. These farmers are part of an emerging movement in agriculture that is changing the way people grow and market food, and the way consumers relate to their food and to the people who produce it. I predict that as you get to know these farmers and begin to understand why they do things the way they do, you will come to appreciate their passion and to value their products. You may even join the movement, if you have not done so already.

The emergent agriculture is grounded in the philosophies of sustainability, local production, and the values of small-scale, family farming. The emergent agriculture values the crafts of the land and engenders not simply the ability to produce food (as if producing food were simple), but the ability to produce safe, nutritious food for dozens, hundreds, even thousands of consumers, and to do so in a manner that does not deplete the earth, that is profitable for the producer, and humane to the organisms in one's care. In short, the emergent agriculture represents an alternative to what is increasingly recognized as an unsustainable industrial system.

As an ecologist, my job is to observe and explain the interactions that occur between living organisms and their environment. I've been at it for nearly 40 years. When I began farming about a decade ago, two things were immediately apparent. First, is that the farm is an ecosystem, structured by the farmer and functioning as a compromise with wild nature. Second, I discovered that I was no longer an observer. I was a stakeholder.



PAM KLEPPEL

I began to realize that my interpretation of the observations made from inside the system were not always the same as those made from the outside. I quickly realized that this perspective would improve my professional understanding of ecology. What I didn't realize initially was how deeply it would inform every aspect of my life.

From what I've learned about the farm ecosystem and the business of farming, I predict that increasing numbers of farmers will abandon industrial food production and commodities-based marketing, preferring the more appreciative, humanizing, and often more lucrative alternatives that are emergent. Clearly, I am no fan of industrial agriculture, but I don't condemn the farmers who participate in it. If you attended an agricultural college in the past 60 years, that is how you were taught to farm. It is probably how your parents farmed. It was, for most farmers, the only game in town. My distain is for the individuals and institutions — often represented by multinational corporations — that abuse farmers by creating bottlenecks in production and distribution chains, by privatizing elements of the food system (such as plant genomes) that have always been in the public domain and belong there, by ignoring the value of craftsmanship, and by turning crafters into anonymous units within a black box of proprietary food production. I deplore those who promote

systems of farming that degrade the earth, jeopardizing the security of the American food supply and the health of the consumer. And I cannot tolerate the inhumane treatment of livestock by an industry that considers such treatment an unfortunate but inescapable part of routine protocol, and a government that accepts this.

The new system of agriculture is a long way from becoming the status quo. We are in the early stages of what is certain to be a slow, sometimes painful process of transformation from the industrial model to something better. If we are indeed witnessing a revolution in food production, we must seek to understand what is happening and the role we will play in it. The transformation must be considered in context, as one of a series of revolutions that have occurred over the ten thousand-year history of agriculture. The most recent of these began in the 18th century as part of the industrial revolution. Even today, it continues to evolve. But the revolution that gave us the industrial model of agriculture has run its course and has turned negative. And a new paradigm is taking its place.

The cornerstone of the industrial revolution was technological innovation. Farmers embraced science and technology as the means by which the efficiency of production and the quality of the product could be improved. Industrial agriculture brought us selective breeding before Darwin and Mendel were even born. It brought us new ploughs and tilling techniques, and numerous other tools and protocols. Production was ramped up to support the growing urban population needed for large-scale manufacturing.

In the early days of the transition to industrial agriculture, farmers had access to few external inputs. Fertilizers consisted of composts and manures produced on the farm. By the early 20th century, however, fertilizers produced by chemists working in the emerging agribusiness sector began making their way onto farms, replacing what livestock produced in the barn and fields. Synthetic fertilizers were developed on the “reductionist” premise that production could be enhanced simply by increasing the total amounts of the major plant nutrients — nitrogen, phosphorus, and potassium — in the soil. The chemists, however, lacked the deep appreciation for the soil that is required by those whose job it is to produce large quantities of food for extended periods of time. While crop yields from synthetic fertilizers were quite good initially, they eventually

wore out the soil. Yields declined and susceptibility to disease and pests increased.

Soil, the industry argued, consists of a mixture of minerals, salts, and organic compounds that form a non-living, physical substrate within which plants can grow. Bacteria, fungi, viruses and other living members of the soil community were considered independent of the medium. It follows, the “reductionist” argument goes, that a knowledge of soil geochemistry was all that was needed to produce a better substrate than the original. The counterpoint to this thinking was the older theory of “humus” — that soil consists of a complex and somewhat mysterious fusion of microbial and geochemical components that together form a living medium which, if disassembled, fails to be soil. Justus von Liebig (1803–1873), a leader in reductionist thinking, claimed that the theory of humus would be debunked as the individual components of soil became more fully understood. He was wrong.

Long before the scientists who study biological complexity taught us that systems like soil cannot be understood by deconstructing them, Sir Albert Howard (1873–1947), the father of modern organic agriculture, demonstrated the inherent failure of agricultural reductionism. Sir Albert showed us what composts — essentially humus facsimiles — could do.³ He challenged the industrial model of soil fertility. Sir Albert, himself a Cambridge-trained mycologist, made a career of restoring the health of impoverished soils with composts, and generating amazing yields of unusually robust crops without the aid of industrial chemistry. Sir Albert appreciated the irreducible interactivity of the soil’s living and non-living components. He focused on the symbioses forged between fungi living in the soil and the roots of the crops that farmers were producing. These symbioses, called “mycorrhizae”, increased in crops grown in well composted soils. Plants containing mycorrhizae grew rapidly, and rarely became diseased or infested by pests. Sir Albert repeatedly challenged the industry to grow the same crops next to his — composts versus chemicals — and see who got the best yields. The industry never took him up on it.

Even so, organic and compost-based agriculture took a back seat to industrial chemistry. Organic farmers, students of Howard, and others, such as the anthroposophists who followed Rudolf Steiner and created

the biodynamic theory of agriculture, were derided as “anti-progressive” mystics. They were considered unappreciative of the values of science and technology and unwilling to grasp the progress being made in modern agriculture. After World War II, petroleum became the driver of industrial agriculture. Cheap oil allowed corporations to produce and farmers to buy (with steep loans) enormously powerful machinery. These tractors and combines shortened the workday, or increased by orders of magnitude the amount of land that a single farmer could work. Agribusiness would cash in on the revolution by developing petroleum-based products that would double or even triple production. However, they would not improve the bottom line for most farmers or the quality of products for most consumers.

In the mid-1960s, corporate America continued tightening its grip on farmers and on the policy makers, who “regulated” both the farmer and the industry. Corporate agribusiness infiltrated government and politics in Washington, securing key positions in Congress, on Presidential Cabinets and in the Judiciary, while continuing to make the case that large-scale production was the future of farming. The application of technological innovation and industrial efficiency would ensure an abundance of food at a modest price for generations to come.

At the same time, Americans of both genders were working outside of the home. Expedience and convenience in the kitchen were crucial — the TV dinner and the fast-food restaurant became iconic of the modern American household. This was the age of NASA’s Apollo Mission, when the United States would send men to the moon. This was the age of Tang, and of comfort in the belief that, like astronauts, we all would soon be taking our meals from a tube. This was the age of government scientists who produced “fish-protein concentrate” that, when sprinkled on rice, provided a nutritious meal to the nutritionally deprived people of the third world, and who failed to understand why people in third world cultures rejected the supplement because they did not consider it food.

By intensifying agriculture with petroleum-based fertilizers and pesticides, production increased dramatically and prices at the market fell. How food was produced, who produced it, and what was sacrificed to get it conveniently to the table were superfluous. Because the government was responsible for food safety and we had faith in the government, we could assume that our food was safe. That, and price, were what mattered.

By the end of the 1960s, increasingly large swatches of the economic safety net that kept farmers afloat when nature dealt them a bad hand were being cut out from under them. Exacerbating the situation, grain failures in the early 1970s led to a sharp increase in beef prices. The federal government responded by intensifying its efforts to control the production system, creating economies of scale that would drive food prices lower. Farmers were under constant pressure to specialize, mechanize, industrialize, and grow. Earl Butz, President Richard Nixon's Secretary of Agriculture, exemplified the sentiment of the Federal government with his infamous "Get big or get out!" slogan. Academic agricultural economists rationalized that approach and the best Land Grant colleges in the nation taught a generation of farmers how to create an operation that would ultimately be swallowed up by some sort of corporate production system. Small scale farmers actually began to believe that the future of agriculture did not include them — that losing their family's farm was progress. The cost of getting big was staggering and as farms collapsed, they were merged into mega-farms with thousands of acres under cultivation. Each farmer



G. KLEPPEL

specialized in one or two products. Farming was now about monocultures and the pesticides and other inputs that kept them going. Production was standardized, and centrally controlled by the industry. Success was based on yield. The farm was now a ten thousand acre assembly line, the farmer was a factory worker, and food was a commodity.

The industrial food system continues to evolve. Today's magic bullet is transgenics. The agent of control is the patenting of the genomes of food organisms by large multinational corporations. The target of the industrial food system is a naïve and complacent consumer, concerned only that something packaged and sold as "food" is abundant and cheap, and can be assumed to be safe. As a generalization we can say that this paradigm has been good for neither producers nor consumers. It has been most profitable, however, for those in the middle — agribusiness, chemical companies, wholesalers, and various other "middlemen." After more than 60 years in this system, it is clear that the industrial model of farming is not working for most farmers or for most consumers. (Heart disease, diabetes, cancer, and obesity are recognized consequences of the modern Western diet.) It works beautifully, however, for multinational corporations.

Despite the derision, the lack of funding for research by US Department of Agriculture (USDA) and Land Grant Colleges, and the labeling (by the industry) of organic and other "unconventional" farming practices as simultaneously "backwater" and "elitist", the proponents of what would come to be known as sustainable agriculture have persevered. These farmers, who work on razor-thin margins, understand that they won't get rich doing what they are doing. They continue, in part, because of the personal satisfaction they derive from practicing their crafts and from being appreciated as craftspeople. Chefs at the country's best restaurants understand the difference between industrial and artisanal products — the difference between locally grown produce and the stuff off a truck that just travelled 1,500 miles. Increasingly, the public is recognizing the difference as well. Growing consumer appreciation for agricultural craftsmanship and its contribution to the quality and safety of our food is driving the transformation in agriculture.

The tide began to turn more quickly in first decade of the 21st century with the publication of Eric Schlosser's *Fast Food Nation* (2002) and

Michael Pollan's *The Omnivore's Dilemma* (2006), which documented the corporate monopolization of the American food supply and which challenged the assumption that our food is safe. Consumers are now beginning to question the notion that food is a commodity, and to realize that the production of safe, nutritious food requires respect for the soil, for living organisms, for ecosystems, and for farmers. The emerging paradigm is already changing the way food is produced and marketed. The farm is once again being recognized as an ecosystem, and the farmer as an integral part of that ecosystem. The market is becoming a collaboration between farmers and consumers, where the availability of information about production processes enhances food security, and where the value placed on farming by consumers ensures sustainability.