WORLD•WATCH

WORKING FOR A SUSTAINABLE FUTURE

Organic Gold Rush

by Brian Halweil

Excerpted from May/June 2001 WORLD WATCH

For more information about Worldwatch Institute and its programs and publications, please visit our website at www.worldwatch.org

WORLDWATCH INSTITUTE
1776 Massachusetts Ave., NW
Washington, DC 20036
www.worldwatch.org

Organic Gold Rush

As people become more aware of the ecological and health costs of chemical-dependent agriculture, the market for organic food is booming. But as it does, small-scale organic farmers are watching the form of agriculture they crafted around simple living and local economies take on a very different appearance.

by Brian Halweil

Forty years ago, when John Haberern joined the Rodale Institute, an organic farming research organization in Kutztown, Pennsylvania, professors at the local agricultural university, Penn State, dismissed him and other organic pioneers as "the counterculture kings of the compost heap." Times have changed. The same professors and deans who wouldn't return calls a decade ago are now contacting Rodale to partner on major grant proposals. And agriculture agencies from a number of countries, including Egypt and Ethiopia, are talking to Rodale about developing nationwide organic-farming programs. "It's a good time for organic agriculture," said Haberern, who is now Rodale's director, during a recent phone conversation.

Spurred by unprecedented consumer demand for healthy, environmentally friendly foods, organics have carved a noticeable stronghold in the conventional foods market, especially in Europe, where organic food now accounts for 3 to 5 percent of sales. This bull market is buoyed by the concerns of people who are fed up with the way most food is grown: British mothers worried about mad cow disease; French families concerned they may be eating foods that contain genetically modified ingredients (GMOs); California parents frustrated by what their children are being served in school lunches; chefs in the culinary vanguard looking for greater variety, freshness, and flavor in their dishes; farmers everywhere tired of applying expensive and toxic agrochemicals to the fields around their homes; conservationists trying to reconcile agricultural and environmental goals; food companies like SEKEM, Egypt's largest tea producer, demanding premium ingredients for their products in a nation that takes tea very seriously.

The growth of the organic market is now reshaping the face of modern agriculture. Millions of hectares of land that were once sprayed with chemical pesticides and fertilizers, coated with sewage sludge, or planted with genetically modified seeds, are now being farmed using ecological interactions to boost harvests. Farmers are rotating crop varieties and composting to return nutrients to the soil, for instance, or attracting beneficial insects to reduce pest outbreaks and disease. But, as production of organic food scales up to meet growing demand, a rift is developing in the organic landscape: small-scale organic farmers, processors, and retailers—the current lifeblood of alternative agriculture—are watching closely as giant farms get certified and multinational food conglomerates rush to unveil organic brands. As the organic market continues to skyrocket to a larger scale, some farmers and consumers are beginning to look a lot more closely at what "organic" really means.

A Bull Market

Driven by a $25 billion global market for organic products, the total area of farmland devoted to cultivating organic crops has grown to an estimated 11.5 million hectares—roughly the size of Cuba. Although

this is still well below 1 percent of the world's cultivated area, the growth trajectory dwarfs that of conventional foods. In every nation for which data exist, farmers are bringing between 10 and 40 percent more land under organic cultivation each year, and a recent U.N. survey found commercial organic food production in every inhabited nation on the planet.

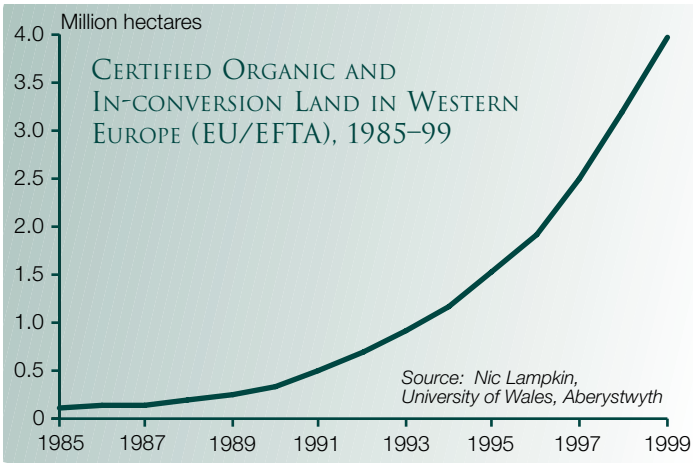
The global organic explosion revolves around Western Europe, where organic area has ballooned 35-fold since 1985—increasing roughly 30 percent each year (see figure, page 24). Organic area now accounts for nearly 3 percent of all the farmland in the European Union. In Sweden, Denmark, Finland, Italy, and Switzerland, it accounts for 5 to 10 percent. In Austria, the organic share has reached 10 percent, and in some Austrian provinces it has reached 50 percent. Europeans are spending nearly $10 billion on organic products each year.

Australia, with 5.3 million certified organic hectares, is the nation with the most organic area. But compared to Europe, this land is relatively low yielding—used mostly to raise pasture-fed beef for export to Japan, where the organic market is now worth $3.5 billion. In the United States and Canada, organic area in cultivation has grown between 15 and 20 percent each year during the 1990s, and now stands at roughly 550,000 and 1 million hectares, respectively. Organic crops now grow on 0.2 percent of U.S. croplands, and in 1.3 percent of the fields in Canada. Retail sales of organic produce and products in North America have registered similar 20 percent annual growth rates since 1989, and were estimated at $10 billion in 1999.

Statistics for the developing world are spotty, although anecdotal evidence points to rapid growth. In Argentina, the total area devoted to organic pro-

"Artificial coloring, artificial flavoring, artificial glop, artificial slop, artificial this, artificial that . . ."

ORGANIC FOODS have come a long way since 1972, when this cartoon was first published. Today, organic foods are widely available, even in many supermarkets, and the marketing of them has become quite sophisticated—as shown by the labels and packages on the following pages.



With a growing number of nations drafting organic standards, setting organic acreage goals, and supporting organic agriculture, the prospects for further growth are bright. Denmark has set a 50 percent organic target by 2012 and Sweden, 10 percent by 2000. In the United Kingdom, the proposed Organic Food and Farming Targets Bill would require that by 2010 not less than 30 percent of agricultural land in England, Wales, and Northern Ireland is certified organic or in conversion, and not less than 20 percent by volume of food consumed is organic. On the current trajectory, as much as 30 percent of the EU's total acreage could be organic by 2010.

Share of Farmland Under Organic Management, 2000

Country/Region	Percent
Austria	10.4
Switzerland	8.3
Finland	7.1
Italy	6.2
Denmark	6.0
Sweden	5.5
EU average	2.8
Germany	2.6
Canada	1.3
United States	0.2
Argentina	0.2

Source: Compiled from various sources by Worldwatch.

duction jumped 7,000 percent since 1992 to an estimated 350,000 hectares today. Argentina exported more than $100 million of organic products in 2000. Over 7,000 small farmers in Uganda—up from 220 in 1995—now produce about 10 percent of the organic cotton on the world market. Under the green food development plan, Heilongjian Province in China has expanded land cultivated in organic foods to half a million hectares. Most of this production is pegged for export, though domestic markets are emerging as local awareness and demand increase.

On both sides of the Atlantic, a series of food safety, ecological, and other troubles associated with the conventional food sector has also inspired strong demand for organic food. Among the British, recent concerns over genetically engineered crops caused a flood of consumer inquiries about organic and an avalanche of farmer applications for conversion. In just the last two years, the United Kingdom's organic acreage surged eightfold, from 50,000 hectares to 400,000 hectares. The well-publicized recall of genetically engineered Starlink corn inspired a similar reaction in the United States.

While consumer demand has driven growth in organics around the world, Europe's sector is outpacing markets elsewhere because it has enjoyed broad government support. Eighty percent of the growth in EU area has occurred in the last six years, spurred by the 1993 establishment of a common EU definition for "organic" and subsequent EU-wide policies to provide financial support for farmers to convert to organics. After the first reports of "mad cows" in Germany, the new agriculture minister pledged to increase organic production from 2.6 percent of farmland today to 20 percent by 2010. Agricultural universities across Europe have opened organic farming departments, and farm ministries have built up organic extension services.

In contrast, growth in the United States—where the total market for organic produce is roughly the same as in Europe—has come despite a lack of conversion assistance and little government support in general. A study by the Santa Cruz, California-based Organic Farming Research Foundation (OFRF) found that less than one-tenth of 1 percent of U.S. Department of Agriculture (USDA) research projects in 1995 had any relevance for organic agriculture. And an aborted 1997 effort by the U.S. government to set federal organic standards would have weakened the industry by permitting genetically modified seeds, confined livestock operations, and other practices never before considered organic. Thomas Dobbs, an agricultural economist at South Dakota State University, says, "U.S. policy is best described as one that is gradually evolving to be less *unfriendly* to organic production."

Beyond the problem of government neglect, the U.S. organic market has been the target of deliberate attacks by the chemical farming industry, which have intensified as consumer interest in organic has grown. The latest of such efforts was a report by the ABC news program "20/20," that relied on fabricated data and statements from an "expert" funded by the pesticide industry to claim that organic foods actual-

ly carried a greater risk of foodborne illness. (The program was forced to issue a retraction.)

Still, there are signs of a more welcome government stance in the United States. In conjunction with a newly released—and much improved—national organic standard, USDA has announced a cost-share program that will cover 70 percent of the certification costs for small producers in 15 states.

Life Outside of the Niche

"It's not completely accurate to call organics a niche market anymore," says Katherine DiMatteo, director of the Organic Trade Association in the United States. "Organic items are no longer limited to health food stores, but shelf space is expanding in major supermarket chains." More exposure means more customers all around, and DiMatteo says that food manufacturers and retailers know that this isn't a fad and are building organic sections for the long haul.

In the spring of 2000, when Iceland, one of Britain's largest supermarket chains, declared that it was converting its entire food line to organics, at no extra cost to consumers, it set off a domino effect in the British food market. Consumers flocked to Iceland products, forcing other food sellers to bulk up their own organic offerings if they hoped to retain market share. Six months later, the United Kingdom's largest supermarket chain, Tesco, entered the fray by dramatically expanding its line of organic foods, while lowering its profit margin on organics to keep them competitive. Tesco shoppers will soon have over 700 organic items to choose from, including fresh produce, meat, frozen and prepared foods, dairy items, bakery goods, alcohol, baby food, and pet food—a sweeping turnaround from 1992, when the chain carried just five organic items.

Dominant players in the global food market, including Danon, Nestle, Mars, and Unilever, are all experimenting with organic products, and they wield

Selling Diversity Protection of plant and animal biodiversity is an important benefit of many organic farms, which support considerably more species than conventional farms do. Many organic sellers make efforts to protect endangered species—using sustainably produced ingredients or donating money to concervation efforts—in recognition that organic consumers are often concerned with more than just the bottom line.

While international food companies are fighting efforts to require more information about food—including efforts to label products containing genetically modified organisms—these cereal boxes tell the story of where the food they contain comes from. Rainforest Crisp gets two of its ingredients (Brazil nuts and vanilla) from the rainforest, and Koala Crisp contributes a share of its profits to a program to save the endangered koala.

Forest ecology is a subject of major importance to the search for a sustainable global economy, since so much income in tropical countries is now derived from activities that raze rainforests—whether for palm oil plantations, cattle ranching, timber, or pulp. Forest products that don't require deforestation, such as sustainably produced cocoa, are crucial to creating a sustainable rainforest economy.

Conservation Farming

The term "organic" describes a holistic approach to farming: fostering diversity, maintaining optimal plant and animal health, and recycling nutrients through complementary biological interactions. At a minimum, organic standards prohibit the use of synthetic pesticides and artificial fertilizers. But organic farming generally also disallows use of growth hormones and antibiotics in livestock production, as well as genetically engineered seeds.

Instead of using modern agriculture's arsenal of chemicals, organic farmers rely on ecological processes—such as using diverse planting patterns or attracting beneficial insects—to raise yields, reduce pest pressures, and build soil fertility. Because organic farming aims to build healthy ecosystems, it provides considerable conservation benefits, including reduced groundwater pollution, fewer greenhouse gas emissions, increased carbon sequestration, improved soil health, and enhanced biodiversity and habitat provision.

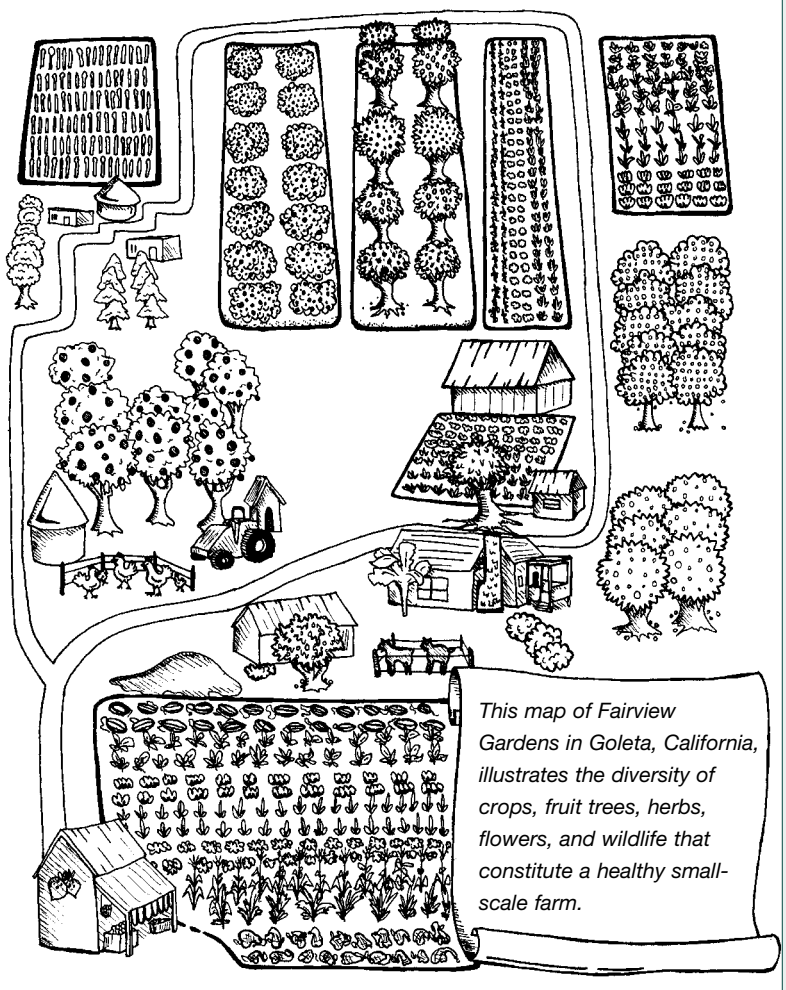
The UK Soil Association, Britain's organic certification body, recently tallied up the findings of 23 comparative studies of the biodiversity benefits of organic and conventional farming. These studies, conducted in Europe over the last 13 years, found substantially greater levels of both abundance and diversity of species on organic farms, including:

- five times as many wild plants, including 57 percent more species. Several rare and declining wild plants were found only on the organic farms;
- 25 percent more birds at the field edge and 44 percent more in the field in the fall and winter;
- 1.6 times as many of the insects that birds eat;
- three times as many non-pest butterflies;
- one to five times as many spiders, and one to two times as many spider species;
- dramatic increases in soil biota, including earthworms.

The Soil Association attributed these benefits to several factors, including more diverse crop rotations, the year-round presence of ground cover, the greater habitat at field boundaries (hedgerows, trees, wild vegetation), no use of herbicides or synthetic pesticides, and use of green manuring (planting nitrogen-fixing crops that are turned into the soil). The authors concluded that organic farming in the United Kingdom was an essential component of any attempt to reverse declining farmland wildlife, and promoting organic farming could deliver more benefit per unit of cost than other government wildlife conservation programs.

Agricultural and environmental agendas are increasingly intertwined as a large share of the world's land area that was once wildlife habitat is now devoted to food production. Promoting a form of farming that builds up, rather than draws down, ecosystem functions will be important to efforts to maintain biodiversity. Broad acceptance for this idea has come from a joint declaration in 1999 issued by International Federation of Organic Agriculture Movements and The World Conservation Union (IUCN).

Conservationists around the globe are now betting on organic farming to deal with a wide range of problems, including water contamination. German water supply companies in Munich, Osnabrück, and Leipzig, for instance, now pay farmers to go organic—a cheaper investment than cleaning farm chemicals out of the water. Similar initiatives are springing up around the world: in Washington state, a coalition of farmers have switched to organic to protect salmon-spawning habitat.



This map of Fairview Gardens in Goleta, California, illustrates the diversity of crops, fruit trees, herbs, flowers, and wildlife that constitute a healthy small-scale farm.

ILLUSTRATION BY JONATHAN GUZMAN

massive advertising and distribution arsenals to aggressively promote them. McDonald's is now serving organic dairy products in Sweden; and Swiss Air has begun serving all-organic meals on flights originating in Switzerland. Even the environmental laggard Dole Foods, the world's largest producer of fresh fruit, vegetables, and cut flowers, now offers organic bananas in North America. In May of 1999, General Mills rolled out its Sunrise line, which it called "the first-ever certified organic cereal from a major manufacturer." Later that year, the multi-national firm acquired the Cascadian Farms brand, an internationally recognized organic producer that has recorded annual sales growth of more than 40 percent over the last few years. Several large apparel companies have begun to purchase organic cotton, including The Gap, Levi's, and Patagonia. Many companies are contracting directly with farmers to provide organic produce for their stores, and some supermarkets have gone a step further, actually paying certain growers to convert to organic.

Organic food is rapidly moving beyond its counter-culture niche and into the mainstream. In fact, in a growing number of countries, most organic food is now sold in supermarkets. Although markets for organics are growing all around, growth in sales at supermarkets is outpacing that of farmers' markets or health food stores. In the United Kingdom, for instance, the share of organic food sold in supermarkets has increased from 63 percent in 1998 to 70 percent today, while the share sold by farmers' markets, independent retailers, or health food stores has declined from 37 percent to 30 percent. In the United States, the share of organic foods sold at discount outlets, like Costco and WalMart, jumped from just one percent in 1998 to 13 percent in 1999, according to the Hartman Group, a Bellevue, Washington-based market research firm. Half of the organic food sales in the United States are now made through conventional supermarkets.

Just a Greener Green Revolution?

All of this growth raises an important question about the future: can organic farming, which has tra-

Know thy farmer Large-scale organic farms are well-equipped to meet the rigorous production standards required for certification, but they may be missing the spirit behind organic farming. "It's not just about buying food that is ecologically produced," says Liz Henderson of the Northeastern Organic Farming Association. It is important to support farmers who have a stake in local communities, employ fair labor practices, and can help people better connect with the food they eat.

Food giants like General Mills have moved quickly to capture a piece of the booming organic market. Organic farming advocates welcome the recognition by large producers that a major shift may be needed in the way crops are grown and processed, but worry that the shift may be commandeered by the large producers in a way that marginalizes the more far-reaching changes they believe a truly sustainable kind of farming requires.

The author of this article, Brian Halweil, gets his food from several local sources—his garden, a community-supported agriculture (CSA) system, and a supermarket. But his most convenient organic food source, the Good Food natural food corner store, is closing up shop soon. The owner, James Joynt, and his family are moving to Pennsylvania's Patch Valley to set up a farm. They'll still be in the same foodshed (his farm will supply Washington, DC with organic food), and Brian will still be able to ask him about how his food has been produced.

ditionally operated on a small scale, expand to meet global demand without taking the same toll on the environment and rural communities that conventional agriculture does?

The newly kindled interest of mainstream consumers is obviously a central reason why more land is being converted, but it also presents some problems for organic farming. On one hand, the interest of major supermarkets and food manufacturers will continue to boost total organic area, reduce bottlenecks in the supply chain, and lower prices, which will mean new customers and a greater market share for organics. On the other hand, demand is growing so quickly that supermarkets often choose to bypass local organic farms in favor of a few large-scale growers that can deliver large quantities of a standardized product year-round.

Consider the Upper Midwest Organic Marketing Project, an attempt between 1995 and 1997 to boost the land under organic production in five American states, as well as consumption of organic products in the Minneapolis-St.Paul metropolitan area. The project was a success, particularly in increasing organic offerings in mainstream supermarkets. But, according to economist Thomas Dobbs, who studied the project, a disconnect developed between regional supply and demand, with greater reliance on large and distant organic suppliers. "Preserving an organic farming and food system that differs substantially from the industrial system may necessitate a slow and deliberate approach," he concludes.

But, organic demand is scaling up right now, at a pace that local growers may not be able to keep up with. "We try to support local, organic growers as much as possible," says Sarah Kenney, marketing director for the Midatlantic region of Whole Foods Markets, the world's largest retailer of natural and organic foods. Produce bins at Whole Foods always carry country or state-of-origin labels, and, particularly during the summer, Whole Foods stores host "locally grown days," which steer customers towards local produce. Still, Kenney notes that "this is a commodity market and sometimes you run into problems of consistency and reliability and price at the local level." U.S.-based Whole Foods may obtain its organic produce from as far away as Chile or New Zealand.

JUST FOR THE RICH? Not at all. It's true that in some parts of the world, the main concern is not how pure the food is, but whether there is enough food at all. However, there is growing recognition that organic farming does not mean catering to a luxury market or growing less food in the same area (see box, page 30).

This Swiss jelly is produced using organic fruit that is purchased from Colombian farmers using fair trade practices. The farmers are given pre-financing and are signed to a long-term contract, and there is no "middle man" to siphon off profits, so the collective of Colombian farmers doesn't get short shrifted.

In Kenya, the Association for Better Land Husbandry has set up a local organic label called Conservation Supreme, and helps farmers shift from conventional to organic methods. The group has also organized farmers into a cooperative called Farmer's Own, which sells organic products throughout Kenya.

The economics of the mass food system represent a rude awakening for the first generation of organic farmers, many of whom seem to have been made immune to consolidation by their grounding in local food systems and close connections with consumers. In agriculture, as with other industries, size brings substantial marketing and distribution advantages. "Such advantages," according to OFRF's Mark Lipson, "mean that the organic sector is very quickly recapitulating the tragedy of conventional agriculture," the process by which bigger players squeeze out the smaller farms and erode rural communities. Profits have been down in the past few years for Lipson's own family farm—a mixed-vegetable operation which he shares with another family—due to a recent surge of entrants into organic vegetable production and a subsequent drop in organic vegetable prices. Medium-sized growers are particularly vulnerable, since smaller growers can often sustain themselves on direct marketing or local outlets.

A flood of corporate incursions—enticed more by economic opportunity than matters of principle—also means that maintaining high standards is increasingly at odds with efforts to maintain the bottom line. In the United States, agriculture-industry pressure on the first round of national organic standards opened the way for the use of GMOs, sewage sludge, food irradiation, and feedlot-style livestock production. (Public outrage later changed this). Fred Kirschenmann, director of the Leopold Center for Sustainable Agriculture and former chair of the National Organic Standards Board Livestock Committee, recalls the time Horizon Organic tried to water down organic standards. Horizon, which sells nearly 70 percent of all organic milk sold in the United States, lobbied to allow for organic dairy farms that would have been essentially confinement operations, similar in many respects to conventional dairy operations where large numbers of animals are not allowed to graze. Gundula Meziani, policy manager at the British Soil Association, remembers recent deliberations in which the National Farmers Union in Britain suggested that organic standards be loosened to include less rigorous practices allowed in other nations, in the name of international competitiveness.

Despite these organic growing pains, it's clearly better to have large organic farms tied into the mainstream food chain than to have conventional farms spraying pesticides and force-feeding antibiotics to livestock. "Even the most industrial organic farm represents a huge improvement over the agricultural status quo," according to Meziani. She points to the fact that while conventional poultry farms in the United Kingdom may house hundreds of thousands of chickens in a single metal building, organic standards allow a maximum of 4,000 hens.

If organic agriculture is to continue its rapid pace of growth without undercutting the small-scale farmers that have nurtured the market thus far, those farmers will need continuing support from consumers who demonstrate a preference for local produce. "The organic movement must push for ecological principles throughout the food system, not just on the farm," says the Leopold Center's Kirschenmann, "or else it will become progressively harder to differentiate organic from the conventional food system."

Kirschenmann warns that if long distance markets and specialization become the norm, the basis of the organic farming system—and the related environmental advantages—will begin to unravel. The gradual depletion of soil nutrients will necessitate the use of lots of external (albeit natural) inputs, which will not only generate transportation related pollution and increase energy consumption, but will exacerbate disease and pest pressures and fail to build soil health.

Building a Better Food System

Consider two different sources of certified organic vegetables in the United States. The first is Natural Selections, which takes up more than 15,000 acres in the American West. The second is Liz Henderson's 15-acre farm (one-thousandth Natural Selection's size) in upstate New York, which includes a small herd of buffalo.

Natural Selections is not a farm, but actually a food marketing company that purchases vegetables from farms throughout California, Arizona, and Baja Mexico. Natural Selections specializes in both conventional and organic salad greens, vegetables, and fruit. Its organic products are marketed through the well-known Earthbound Farms label. Natural Selections controls its own washing, processing and packaging facilities in California and Arizona—a sort of vertical integration that has become the pattern in conventional agribusiness. Some of the farms that produce for Natural Selections are as big as 500 acres, and are highly mechanized and standardized operations; some employ migrant labor. Natural Selections also contracts with other suppliers of organic foods so that it can offer a full list of produce to international supermarket clients year round.

In contrast, Henderson and her two business partners work the Peacework Organic Farm, and employ one to two local hired hands during harvest time. All of their produce serves surrounding areas through a community supported agriculture (CSA) scheme, in which members pay for a season's worth of produce up-front or in installments. The CSA fee operates on a sliding scale, with scholarship money available for people who can't afford to pay at all, so Peacework's produce is not just "yuppie food," as Henderson puts it. All participants work in some way to help out the

Organic Myths

Myth #1: Organic farming cannot produce nearly as much food as conventional farming.

Reality: Several scientific surveys have found that yields from organic fields are comparable to those of conventional systems, especially over the long-term. Organic farms are likely to be at a disadvantage when they first convert, simply because the farm is being weaned from chemical dependence. But this disadvantage shrinks as the ecological infrastructure of the farm—beneficial insect populations, soil microbial activity, soil organic matter—and the know-how of the farmer gradually builds.

A U.S. Department of Agriculture symposium in April of 1999 brought together the best research from land grant universities to get a sense of the comparative economics and productivity of organic and conventional farming. In nine case studies representing an array of crops and growing regions in the United States, nearly all of the organic systems were still more profitable than the conventional counterpart—the result of decreased dependence on costly agricultural chemicals and greater crop stability. Take away the premium that farmers receive for selling organic foods, and many organic farms were more profitable. Most were in the same ballpark on yield, and some out-produced the conventional fields. Such findings are confirmed by trials at the Rodale Institute that showed yields of corn and soybeans differing by less than 1 percent between the organic and conventional systems over ten years.

There is an important caveat. Since organic systems discourage monoculture (growing the same crop year after year), acreage devoted to any given crop is likely to be lower and there will be a different mix of production over the long-term. (In other words, although an organic farm can yield as much corn as the conventional operation in any given year, over a four year period, the conventional farm will bring you more total corn.)

Myth #2: Organic farming cannot help feed the hungry in the developing world. Or, as Norman Borlaug, a Nobel-laureate agricultural scientist, puts it: "While the affluent nations can certainly afford to pay more for food produced by so-called 'organic' methods, the one billion chronically undernourished people of the low-income, food-deficit nations cannot."

Reality: Many of the world's one billion undernourished people are rural families that continue to be poor and hungry *because they have been bypassed by expensive agricultural technologies and systems.* In fact, the proactive principles of organic farming may be these farmers' best hope.

Organic farming has great relevance for alleviating poverty and hunger in the developing world, according to Peter Rosset, director of the Institute for Food and Development Policy (FoodFirst). "For poor farmers in developing countries, any technology based on purchased inputs puts them at an immediate disadvantage in competition with wealthier farmers. Organic farming methods place emphasis on the local resources and knowledge that the farmer already has, and puts ecological processes at the service of the farmer."

When the combination of a strengthened U.S. embargo and the collapse of the Soviet Bloc eliminated Cuba's primary source of food, petroleum, and agrochemicals, this island nation was essentially forced to use ecosystem services and farmer know-how to get by. The nation-wide shift to organic farming includes an estimated 30,000 urban gardens, which are a principal source of fresh produce for Cuba's cities. "In Cuba, organic farming techniques have been used massively to guarantee the food security of everyone, especially the poorest," says Rosset, "in contrast to the U.S. and Europe where the better-off derive the most benefit."

Organic farming might be of greatest relevance in ecologically sensitive rural areas (home to a disproportionate share of the world's hungry), where poor farmers have been bypassed by the technologies of modern agriculture, including irrigation and chemical fertilizers and pesticides.

For example, an on-going collaboration between the U.S.-based Rodale Institute and agricultural officials and nonprofit groups from Senegal is helping to boost food security in countries in Africa's Sahel desert—a region characterized by erratic rainfall, low natural soil fertility, and high rates of erosion and desertification. (The Sahel is also home to one of the most severe and entrenched pockets of hunger on the planet, with over half of the children chronically malnourished in several nations.) The project is employing a combination of measures to check erosion (stone barriers and trenches) and boost the fertility of the soil (integration of livestock and crop production, composting manures, planting trees and native plants that fix nitrogen and other nutrients). These changes have tripled yields and increased the likelihood that crops will weather severe droughts.

The Senegal project was recently included in the "largest known survey of worldwide sustainable agriculture," in which Jules Pretty of the University of Essex looked at more than 200 projects in 52 developing countries that depended on such organic-style techniques. Pretty found that for all the projects—in total, 9 million farms on nearly 30 million hectares—yields increased an average of 73 percent, and substantially more in some cases.

An important institutional boost to this research came in January 1999, when the U.N. Food and Agriculture Organization said it would begin providing information and technical support for organic farming, and explore the feasibility of how it could improve food security and natural resource use in the developing world. In a second statement in March 2001, FAO said more bluntly that organic farming could help reduce hunger.

CSA, either on or off the farm, which Henderson calls a "large scale home garden for 240 families." Peacework uses no fertilizers (not even those inputs allowed under organic standards), while some of Natural Selection's farms often truck in large quantities of composted manure or other approved inputs.

"Most small-scale producers would say that organic by nature works better at the small scale, allowing greater attention to the subtle signs of soil health or pest imbalance," says Lori Ann Thrupp, a U.S. Environmental Protection Agency ecologist who has studied several small and large organic wine, vegetable, and fruit farms in the United States. "Arguably, organic standards can be met at a wide range of scales." In contrast to the micromanagement of ecological processes that small scale allows, Thrupp explains, a larger operation might divide its farm into blocks of biodiversity that are rotated from season to season, or have different farmers who are expert in a certain crop use the land from year to year.

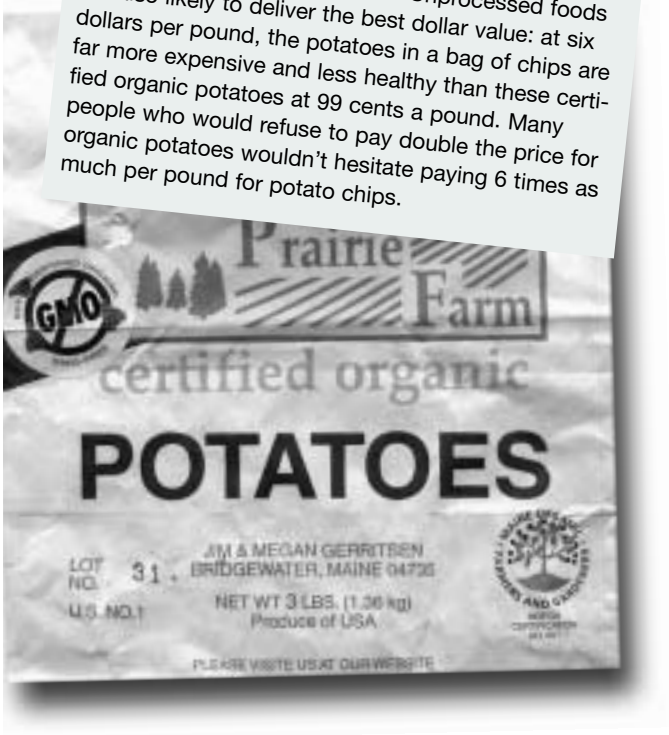
Ultimately, two complementary markets for organic products may develop: the industrial organic stream, which services major supermarkets and food manufacturers, and the local and regional organic stream, which maintains a strong connection to consumers. In light of the different types of organic production, Bernward Geier, director of the International Federation of Organic Agriculture Movements (IFOAM), favors keeping organic standards growing to incorporate more issues of sustainability. Local food systems, food security, farmworker rights, resource use efficiency—these might be called the "beyond organic" issues. Henderson's farm represents a form of organic that embodies many of the ecological, social, ethical, and even spiritual characteristics not currently or explicitly regulated by organic standards. "Organic is necessary, but not sufficient, for a sustainable food system," is how Lipson of OFRF sums it up.

"You can't write standards for how you treat your neighbor down the road or for a commitment to community or concern for maintaining the health of the soil," says John Ikerd of the University of Missouri. Nonetheless, Ikerd believes that the founders

HEALTHY LAND, HEALTHY BODY The term "organic" connotes healthy eating not simply because the food is grown without spraying known carcinogens on the plants and soil, but also because it is associated with a style of living that emphasizes fresh, whole foods and home cooking as opposed to fast food.

Today there are organic equivalents for virtually any food item. But even packaged organic food has processing standards, so these items won't contain any artificial flavors or colors, preservatives or hydrogenated fats. This frozen organic meal is designed for people who want nutritious food, but are rushed for time.

The organics movement is intertwined with efforts to eat whole foods: fresh, unprocessed foods that provide maximum nutritional value. Unprocessed foods are also likely to deliver the best dollar value: at six dollars per pound, the potatoes in a bag of chips are far more expensive and less healthy than these certified organic potatoes at 99 cents a pound. Many people who would refuse to pay double the price for organic potatoes wouldn't hesitate paying 6 times as much per pound for potato chips.



of the organic farming movement clearly had these intangibles in mind. He cites Sir Albert Howard's 1943 book, *An Agricultural Testament* in which Howard hoped that organic farming might help us learn "to subordinate the profit motive to the sacred duty of handing over unimpaired to the next generation the heritage of a fertile soil." Such distinctions, Ikerd is confident, mean a lot to a growing group of consumers for whom "organic is as much a philosophy of life as a physical characteristic of the foods they eat."

The Soil Association's Meziani also sees room for improvement: "Only a small portion of today's organic farms embody the ideal of ecologically functioning systems." Meziani points to highly sophisticated versions of organic farming, such as biodynamic farming, in which extensive composting, carefully tuned planting times, and modulation of soil biota often result in near disease-free crops and livestock. "Further honing of organic systems will come with practice and research," says Meziani, "and standards should reflect such learning."

The likelihood of such improvement will depend on the flexibility of organic standards, but also on who controls them. Organic standards that function as a floor—a bare-bones minimum for compliance—are important to reduce opportunities for abuse, particularly when people are buying food off a store shelf instead of direct from the farmer. But standards that also serve as a ceiling will cripple the incentive to improve, as well as the means by which small and medium sized growers can differentiate themselves from the mass organic chain. The newly released organic standards in the United States, for instance, do not allow farmers and private certifiers to certify to a higher standard, a clause that will likely spur legal battles in coming years. Moreover, it is essential that the governance of the standards remain with people who are devoted to the philosophy, and who are not just looking to cut costs.

The bull market in organic products may represent the first step in an evolution for farmers, consumers, and the food system in general. Farmers who make the decision to grow organic may begin to rethink energy use on their farm or how they can improve the efficiency of their water use. Food sellers, from farmers markets to neighborhood co-ops to supermarket chains, might display additional information about the food they carry or even develop buying standards of their own. For consumers who decide to buy organic, it may only be a small additional step to begin to shop in season or favor local farmers—steps that also guarantee the best price for organic foods.

Consumers are the central players in this agricultural evolution. The current proliferation of organic farming hints at just how much power they wield—at how ordinary people can demand a different choice in the market place and drive monumental change in the economic sphere. The proliferation of organic farming also points to the spreading desire of people to know the story behind their food. Where was it grown? Who owned the land? What crops were rotated with it? Was the land doused with chemicals? Was livestock injected with hormones? What sort of labor was used on the farm? Did the farmer get a fair price? Interest in such details is getting more intense, and is a big part of what will further drive the transformation of our food system.

Brian Halweil is a research associate at the Worldwatch Institute.

BABY FOOD: Parents will often buy organic foods for their babies and infants before they will buy organic for themselves. Concern about pesticide residues in foods, and the greater sensitivity of infants to damage from these residues, propels the organic babyfood market. BioBambini is one of the brand names of Sunval, a Germany-based company that began selling organic babyfood in 1950, making it one of the oldest manufacturers of organic babyfood in the world. BioBambini is now sold in dozens of countries in Europe, North America, the Middle East, and Asia.