

The Green Invasion

By Betsy Querna
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Grocery shoppers across America have been witnessing a subtle but revolutionary change on store shelves. Organic products are popping up in the cereal aisle, amid rows of canned goods, and beside bottles of salad dressing. Though organic food has been around for decades, it used to be found mainly in specialty stores like Whole Foods or confined to a tiny corner in the produce section.



Today, most grocery stores stock big organic brands like Earthbound Farm. Wal-Mart plans to double its organic offerings this summer in some stores, and grocers like SuperValu and Safeway recently unveiled organic house brands. Major food companies have grabbed up organic brands. General Mills, for example, owns the organic brands Cascadian Farm and Muir Glen. Some food producers are even rolling out organic versions of existing products. You can now fill your cart with Ragu organic pasta sauce, Snyder's organic pretzels, Orville Redenbacher's organic butter popcorn, and later this summer, organic Kraft macaroni and cheese. "With Wal-Mart in the game and Safeway and just about everyone else, organic is at a tipping point," says Samuel Fromartz, author of the new book *Organic, Inc.* "It's really gone mainstream."

Getting specific. With so many more choices, consumers may wonder what they're really getting when they buy this newfangled organic food. Though the organic label is often perceived as synonymous with healthful, virtuous, or just plain better, organic has a specific definition, set in 2000 by the U.S. Department of Agriculture after years of varying standards muddled its meaning. In a nutshell, organic produce cannot be grown with pesticides or most synthetic fertilizers, while animals must not be injected with antibiotics or growth hormones. Organic farms undergo a rigorous certification process and are inspected for compliance by an independent agent.

To earn the "100 percent organic" label under the USDA system, a food must contain only organically produced ingredients. Next in line is "organic," in which at least 95 percent of the ingredients must be organic. The other 5 percent must be an approved ingredient. Those are mostly preservatives, thickeners, or other things such as baking soda and spices. Here and with "100 percent organic" foods, consumers may also spot the USDA seal. Products that have at least 70 percent organic ingredients can sport the term "made with organic ingredients." Any less and the food gets no boasting rights beyond noting the organic elements in the list of ingredients. (In some cases, you will see a certifying agent seal. More details are at www.ams.usda.gov/nop.)

Got that? It's a mouthful, so to speak, and consumers often think that the organic label means so much more. "It's confusing because the organic certification is a process certification, not a product certification," says Mike Hamm, professor of sustainable agriculture at Michigan State University. "It says nothing about the quality of the product, its freshness, or its nutritional value."

What consumers should do, experts say, is carefully consider each organic purchase. There may be no reason to buy an organic version of a favorite food when its conventional counterpart is little or no different and most likely cheaper. On average, organic food costs 30 to 50 percent more than conventional food. Heinz's Classico pasta sauce usually sells for about \$3; the organic version is a dollar more. Many expect the new players, especially Wal-Mart, to prompt a marketwide price drop. The retailing behemoth has said its organic products will cost only 10 percent more than its nonorganic products. What's more, shoppers need to keep in mind that the jury is still out on whether organic food is more nutritious or safer. For years, scientists have been

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fiercely debating the health benefits of organic food, and studies so far have been small and equivocal.

While organic fruits and vegetables do usually have fewer pesticides than their conventional cousins, there is no consensus on how harmful those pesticides are to humans. Joseph Rosen, a professor of food science at Rutgers University who has been studying pesticides for more than 40 years, contends that the amount of pesticides on produce is too small to hurt and that the liver efficiently flushes them out. Other experts dispute that notion, and some shoppers don't want to take the risk.

Choosy buyers. Pesticides may be more of a concern for children because their small bodies are less able to metabolize pesticides--and they ingest more food per pound of body weight than adults, according to a 1993 National Academy of Sciences report. Philip Landrigan, a pediatrician at Mount Sinai School of Medicine who chaired the report committee, advises parents to go organic on the fruits and vegetables their kids consume a lot.

To reduce potential exposure to pesticides without breaking the bank, consumers should become choosy fruit buyers. A 2003 Environmental Working Group study that looked at USDA pesticide data from more than 100,000 pieces of produce found that those with the most pesticides include strawberries, peaches, nectarines, bell peppers, and spinach. Because of the way they are grown or their heartiness, conventional broccoli, asparagus, mangos, and bananas are less likely to have pesticides.

Recently, several small studies have shown that organic fruits and vegetables might also have higher amounts of protective antioxidants. The thinking: Without pesticides, the plant must rely on its own defenses to shoo away bugs; one way it does this is to make more antioxidants. Still, it's only a hypothesis. "I wouldn't tell my mom or neighbor to go buy organic because it has more antioxidants," says Kathleen Merrigan, director of the agriculture, food, and environment program at Tufts University and an author of the USDA organic standards rule. "I would tell them to buy it because it has fewer pesticides."

In the dairy case, organic milk gained popularity in the early 1990s when many big dairies began using the controversial recombinant bovine growth hormone to help increase a cow's milk production. Some groups say it can increase the risk of certain cancers or contribute to the early onset of puberty in girls, though the Food and Drug Administration found no human health issues--nor did a Canadian panel that examined the hormone in the late 1990s.

Space to roam. While health concerns motivate many buyers, others prefer organic milk for more humanitarian reasons. Many organic milk producers are small farmers, and their cows are often given more space to roam than cows at large dairies. In fact, major organic dairy producers such as Horizon have come under much criticism for their pasture size. On an Idaho farm that's taken the brunt, the cows "are very comfortable," says Kelly Shea, a Horizon vice president. "They have a nice life." Shea adds that the company is now converting more land to organic there so the cows can have more room and increase their grass consumption. The USDA is currently seeking comments on a rule that would nail down the amount of pasture required for these cows.

On conventional farms, animals are routinely given hormones and antibiotics, which could be passed on to your dinner plate. Though there is no scientific consensus about whether these substances cause health problems, shoppers who want to avoid them can look for other phrases on meat packages. "You are not necessarily going to see the organic label," says Keecha Harris, a national nutrition consultant for the Head Start program. "You are going to see how the animal is raised." Beef that is marked "pasture-raised," for example, means the cow grazed on grass, and "free-range" denotes chickens that aren't confined to small cages. Or the package of pork chops might state that no growth hormones or antibiotics were used or that the pig was fed an all-

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vegetable diet. Some stores, such as Whole Foods, set their own guidelines for the meat they buy, and thus the packages may not be labeled. The best way to figure it out: Ask the butcher.

These days, the biggest organic explosion is in the middle of the store, where the cereals, frozen foods, and processed packaged goods are sold. Experts urge shoppers to remember that the organic label means one thing and one thing only. So the corn in Orville Redenbacher's organic microwave popcorn comes from an organic farm; Heinz's organic ketchup uses organic tomato concentrate and organic sugar. Shoppers still need to flip over those jars and packages and scrutinize the nutrition facts, says Dawn Jackson Blatner, a registered dietitian with Northwestern Memorial Hospital in Chicago. Organic food and regular food should be viewed with the same skepticism when it comes to calories and fat.

Take Whole Foods organic chocolate truffles made with organic cocoa beans, organic vegetable oil, and organic cane sugar. With just three candies packing more than half of the daily allowance of fat, they're not exactly a health food. But, "they taste pretty good," says Fromartz.

In the end, nearly everyone—even the most ardent organic fans—recommends that a consumer's first goal be a nutritionally balanced diet. Then the organic decision comes into play. "What people should be doing is getting more fruits and vegetables regardless of whether they're conventional or organic," says Harris. "A cheese puff is a cheese puff is a cheese puff."

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Farmers Cope With Roundup-Resistant Weeds

By [WILLIAM NEUMAN](#) and [ANDREW POLLACK](#)

DYERSBURG, Tenn. — For 15 years, Eddie Anderson, a farmer, has been a strict adherent of no-till agriculture, an environmentally friendly technique that all but eliminates plowing to curb erosion and the harmful runoff of fertilizers and pesticides.

But not this year.

On a recent afternoon here, Mr. Anderson watched as tractors crisscrossed a rolling field — plowing and mixing herbicides into the soil to kill weeds where soybeans will soon be planted.

Just as the heavy use of antibiotics contributed to the rise of drug-resistant supergerms, American farmers' near-ubiquitous use of the weedkiller Roundup has led to the rapid growth of tenacious new superweeds.

To fight them, Mr. Anderson and farmers throughout the East, Midwest and South are being forced to spray fields with more toxic herbicides, pull weeds by hand and return to more labor-intensive methods like regular plowing.

"We're back to where we were 20 years ago," said Mr. Anderson, who will plow about one-third of his 3,000 acres of soybean fields this spring, more than he has in years. "We're trying to find out what works."

Farm experts say that such efforts could lead to higher [food prices](#), lower crop yields, rising farm costs and more pollution of land and water.

"It is the single largest threat to production agriculture that we have ever seen," said Andrew Wargo III, the president of the Arkansas Association of Conservation Districts.

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The first resistant species to pose a serious threat to agriculture was spotted in a Delaware soybean field in 2000. Since then, the problem has spread, with 10 resistant species in at least 22 states infesting millions of acres, predominantly soybeans, cotton and corn.

The superweeds could temper American agriculture's enthusiasm for some [genetically modified crops](#). Soybeans, corn and cotton that are engineered to survive spraying with Roundup have become standard in American fields. However, if Roundup doesn't kill the weeds, farmers have little incentive to spend the extra money for the special seeds.

Roundup — originally made by [Monsanto](#) but now also sold by others under the generic name glyphosate — has been little short of a miracle chemical for farmers. It kills a broad spectrum of weeds, is easy and safe to work with, and breaks down quickly, reducing its environmental impact.

Sales took off in the late 1990s, after Monsanto created its brand of Roundup Ready crops that were genetically modified to tolerate the chemical, allowing farmers to spray their fields to kill the weeds while leaving the crop unharmed. Today, Roundup Ready crops account for about 90 percent of the soybeans and 70 percent of the corn and cotton grown in the United States.

But farmers sprayed so much Roundup that weeds quickly evolved to survive it. “What we're talking about here is Darwinian evolution in fast-forward,” Mike Owen, a weed scientist at [Iowa State University](#), said.

Now, Roundup-resistant weeds like horseweed and giant ragweed are forcing farmers to go back to more expensive techniques that they had long ago abandoned.

Mr. Anderson, the farmer, is wrestling with a particularly tenacious species of glyphosate-resistant pest called Palmer amaranth, or pigweed, whose resistant form began seriously infesting farms in western Tennessee only last year.

Pigweed can grow three inches a day and reach seven feet or more, choking out crops; it is so sturdy that it can damage harvesting equipment. In an attempt to kill the pest before it becomes that big, Mr. Anderson and his neighbors are plowing their fields and mixing herbicides into the soil.

That threatens to reverse one of the agricultural advances bolstered by the Roundup revolution: minimum-till farming. By combining Roundup and Roundup Ready crops, farmers did not have to plow under the weeds to control them. That reduced erosion, the runoff of chemicals into waterways and the use of fuel for tractors.

If frequent plowing becomes necessary again, “that is certainly a major concern for our environment,” Ken Smith, a weed scientist at the [University of Arkansas](#), said. In addition, some critics of genetically engineered crops say that the use of extra herbicides, including some old ones that are less environmentally tolerable than Roundup, belies the claims made by the biotechnology industry that its crops would be better for the environment.

“The biotech industry is taking us into a more pesticide-dependent agriculture when they've always promised, and we need to be going in, the opposite direction,” said Bill Freese, a science policy analyst for the Center for Food Safety in Washington.

So far, weed scientists estimate that the total amount of United States farmland afflicted by Roundup-resistant weeds is relatively small — seven million to 10 million acres, according to Ian Heap, director of the International Survey of Herbicide Resistant Weeds, which is financed by the agricultural chemical industry. There are roughly 170 million acres planted with corn, soybeans and cotton, the crops most affected.

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Roundup-resistant weeds are also found in several other countries, including Australia, China and Brazil, according to the survey.

Monsanto, which once argued that resistance would not become a major problem, now cautions against exaggerating its impact. "It's a serious issue, but it's manageable," said Rick Cole, who manages weed resistance issues in the United States for the company.

Of course, Monsanto stands to lose a lot of business if farmers use less Roundup and Roundup Ready seeds.

"You're having to add another product with the Roundup to kill your weeds," said Steve Doster, a corn and soybean farmer in Barnum, Iowa. "So then why are we buying the Roundup Ready product?"

Monsanto argues that Roundup still controls hundreds of weeds. But the company is concerned enough about the problem that it is taking the extraordinary step of subsidizing cotton farmers' purchases of competing herbicides to supplement Roundup.

Monsanto and other agricultural biotech companies are also developing genetically engineered crops resistant to other herbicides.

Bayer is already selling cotton and soybeans resistant to glufosinate, another weedkiller. Monsanto's newest corn is tolerant of both glyphosate and glufosinate, and the company is developing crops resistant to dicamba, an older pesticide. [Syngenta](#) is developing soybeans tolerant of its Callisto product. And [Dow Chemical](#) is developing corn and soybeans resistant to 2,4-D, a component of Agent Orange, the defoliant used in the Vietnam War.

Still, scientists and farmers say that glyphosate is a once-in-a-century discovery, and steps need to be taken to preserve its effectiveness.

Glyphosate "is as important for reliable global food production as penicillin is for battling disease," Stephen B. Powles, an Australian weed expert, wrote in a commentary in January in The [Proceedings of the National Academy of Sciences](#).

The [National Research Council](#), which advises the federal government on scientific matters, [sounded its own warning last month](#), saying that the emergence of resistant weeds jeopardized the substantial benefits that genetically engineered crops were providing to farmers and the environment.

Weed scientists are urging farmers to alternate glyphosate with other herbicides. But the price of glyphosate has been falling as competition increases from generic versions, encouraging farmers to keep relying on it.

Something needs to be done, said Louie Perry Jr., a cotton grower whose great-great-grandfather started his farm in Moultrie, Ga., in 1830.

Georgia has been one of the states hit hardest by Roundup-resistant pigweed, and Mr. Perry said the pest could pose as big a threat to cotton farming in the South as the beetle that devastated the industry in the early 20th century.

"If we don't whip this thing, it's going to be like the boll weevil did to cotton," said Mr. Perry, who is also chairman of the Georgia Cotton Commission. "It will take it away."

William Neuman reported from Dyersburg, Tenn., and Andrew Pollack from Los Angeles.

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Europe Defends Stance on Genetically Altered Foods

By PAUL MELLER

BRUSSELS, Feb. 8 - The European Commission defended its current practices on screening genetically altered foods in the wake of a report from the World Trade Organization that criticized its past action in restricting the entry of modified products into the European Union.

The W.T.O. report, which was leaked to the news media Tuesday night, drew sharp criticism from environmental groups, which contend that the European Union's rules on biotechnology are too lax and that health safeguards are not a trade issue. The commission held back from being too specific in its remarks, as the report remains confidential and, at 1,050 pages, will take some time to digest.

The preliminary report, which examined practices from 1998 to 2003, found that some countries in the European Union went beyond the union's rules in keeping out genetically modified crops. The report also said the European Union had kept some products out by deliberately failing to approve them quickly enough. The delays amounted to a de facto moratorium, the W.T.O. said - a point the commission disputes.

Peter Power, the spokesman for European Union-wide trade issues at the European Commission, played down the relevance of the report on Wednesday. Since 2004, the European Union has accelerated its approval process for genetically modified products and has cleared nine such products for import.

"It is largely of historical interest," he said of the report, adding that it "will not alter the system within which the European Union takes decisions on G.M.O.'s," or genetically modified organisms.

But Friends of the Earth, a leading environmental group, described the report as "an inappropriate intrusion into decisions about what food people eat." Adrian Bebb, a campaigner on genetically altered foods at Friends of the Earth Europe, said, "The W.T.O. has bluntly ruled that European safeguards should be sacrificed to benefit biotech corporations."

The commission, the executive body of the 25-member European Union, reacted angrily to the remarks, according to one person familiar with thinking in its trade department. "They are misleading people," he said, asking not to be named because the W.T.O. report is still confidential.

"The system is working. The science is sound," that person said. "The approval process and the consumer safety standards applied in the union may be more stringent than in the United States, but G.M.O. imports to the union are rising, especially from competitive exporters like Brazil."

National governments around the European Union, however, were more circumspect.

"The protection of people and the environment have absolute priority, and the most recent scientific research vindicates our cautious approach in this matter," Maria Rauch-Kallat, Austria's health minister, told the Reuters news agency. "We will exhaust all possibilities to keep Austria's agriculture G.M.-free and ensure consumers' safety." Austria, along with France, Greece, Germany, Italy and Luxembourg, has stricter limits than the European Union itself.

Meanwhile, Europe's biotechnology industry said Wednesday it supported the commission's new approach to genetically modified foods, which rests on scientific testing and labeling. "The European biotechnology

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industry, like the European Commission, supports choice - the choice to grow, import and consume approved G.M. products," EuropaBio, a trade group, said in a statement. Responding to questions prompted by the leaking of the W.T.O. report, the United States trade representative, Rob Portman, said the facts about genetically altered foods were "clear and compelling."

"It is safe and beneficial technology that is improving food security and helping to reduce poverty worldwide," Mr. Portman said. He added, "We believe agricultural biotechnology products should be provided a timely, transparent and scientific review by the European Union, and that is why Canada, Argentina and the United States brought the case in the first place."