Every once in a while the NEW YORK TIMES knocks your socks off showing how the world got the way it is. This past Sunday the TIMES ran “Playing God in the Garden” by Michael Pollan --the cover story in the magazine section.[1] It explains why many of us are already eating genetically engineered foods like corn and potatoes without knowing it, and why there is a lot more genetically engineered food in our future whether we like it or not. It's the story of a powerful corporation on a dangerous mission and a huge government too feeble to intercede. The TIMES story makes these points:

** Genetically engineered food crops have been on the market in the U.S. for four years now. Some brands of corn, potatoes and soybeans are now genetically engineered.

** The nation's food safety authority --the U.S. Food and Drug Administration (FDA) --does not require genetically engineered food crops to be labeled as such, so none of us can know whether the food we are eating is genetically engineered or not. Chances are pretty good that if you eat french fries at McDonald's, or if you eat Frito-Lay potato chips, you've eaten a genetically-engineered potato patented by Monsanto, the St. Louis chemical giant. The TIMES story focuses on Monsanto's New Leaf Superior potato, a thin-skinned white spud found fresh in your supermarket.

** Monsanto's New Leaf Superior potato is, itself, legally registered as a pesticide with U.S. Environmental Protection Agency [EPA] because it has been genetically engineered to poison any Colorado potato beetle that might eat even a tiny portion of it. Every cell of Monsanto's New Leaf Superior contains a gene snipped from a bacteria called BACILLUS THURIENGENSIS, or Bt for short, which produces a protein that is highly toxic to Colorado potato beetles. The Bt gene is present in every cell of a Monsanto New Leaf Superior, which is why the potato itself is registered as a pesticide.

** U.S. EPA [Environmental Protection Agency] has responsibility for licensing new pesticides. EPA pesticide officials believe that the New Leaf Superior potato is reasonably safe for humans. As a test, EPA fed pure Bt to mice without harming them. Because humans have eaten old-style New Leaf potatoes for a long time, and mice are not visibly harmed by eating pure Bt, potatoes containing Bt genes must be safe for humans, EPA reasoned. The TIMES reported, "Some geneticists believe this reasoning is flawed" because inserting foreign genes into plants may cause subtle changes that are difficult to recognize. Only time will tell.

** The label on a bag of Monsanto's pesticidal potatoes in the supermarket lists all of the nutrients and micronutrients in the potato, but fails to mention that the potatoes have been genetically engineered or that they are legally a pesticide. Food labeling is ordinarily the responsibility of FDA.

** An FDA official told the NEW YORK TIMES that FDA does not regulate Monsanto's potato because FDA does not have the authority to regulate pesticides. That is EPA's job.

** EPA-approved pesticides normally carry an EPA-approved warning label. For example, a bottle of Bt bears a label that warns people to avoid inhaling Bt and to avoid getting Bt in an open wound. However, in the case of Monsanto's pesticidal potato, EPA says FDA has responsibility for requiring a label because the potato is a food. However, FDA told the TIMES that it only requires genetically-engineered foods to be labeled if they contain allergens or have been "materially changed" and FDA has determined that Monsanto did not "materially change" the New Leaf potato by turning it into a pesticide. Therefore no FDA label is required. Furthermore, the law that empowers the FDA (the Food, Drug and Cosmetic Act) forbids FDA from including any information about pesticides on food labels. Pesticide labels are EPA's responsibility, says FDA, and we come full circle.

** Some genetically-engineered food crops are NOT registered as pesticides, and FDA DOES have the authority to regulate those. However, according to the TIMES, FDA maintains a list of foods that need no regulation because they are "generally recognized as safe" (or "GRAS"). Since 1992 FDA has allowed companies like Monsanto to decide for themselves whether their new genetically-engineered foods should be added to the GRAS list and thus escape regulation. In other words, FDA regulation of genetically engineered foods is voluntary, not mandatory.

** A Monsanto official told the NEW YORK TIMES that the corporation should not have to take responsibility for the safety of its food products. "Monsanto should not have to vouchsafe the safety of biotech food," said Phil Angell, Monsanto's director of corporate communications. "Our interest is in selling as much of it as possible. Assuring its safety is the FDA's job," Angell said.

In sum, biotech is an industry in the grip of a frontier mentality. Anything goes. Government is a willing and servile participant. It if turns out worse than the chemical debacles of the last 50 years, will anyone be surprised?

** Monsanto's New Leaf Superior potatoes will have major effects on U.S. agriculture, regardless of their human health consequences (if any).

** Organic farmers --those who try to avoid synthetic chemical pesticides and fertilizers to the extent possible-- apply powdered Bt sparingly to their crops from time to time, a natural pesticide of last resort. In this powdered form, Bt is neither present in high concentrations nor for very long because it degrades in sunlight. Therefore, insects have not developed "resistance" to Bt.

** But now that Bt is continuously present in whole fields of Monsanto potatoes, the insects in those field will be continuously exposed to Bt. Therefore it is only a matter of time before they develop "resistance" and become immune to Bt's toxic effects.

The mechanism of resistance is well understood because over 500 insects have become resistant to one pesticide or another since 1945. Not every potato beetle will be killed by eating Monsanto's pesticidal potatoes. A few hardy beetles will survive. When those few resistant beetles mate with other resistant beetles, a new variety of potato beetle will spring into being and it will thrive by eating Monsanto's potatoes. At that point, Bt will have lost its effectiveness as a pesticide. Then Monsanto will start marketing some new "silver bullet" to control the Colorado potato beetle. But what will the nation's organic farmers do? For private gain, Monsanto will have destroyed a public good --the natural pesticidal properties of Bt. Monsanto scientists acknowledged to the NEW YORK TIMES that the Bt-containing potato will create Bt-resistant potato beetles. They know exactly what they are trying to do. They are hoping to make a mint selling Bt-laced potatoes and, in the process, depriving their competitors (organic farmers) of an essential, time-honored tool. The strategy is brilliant, and utterly ruthless.

** For decades, Monsanto and other agrichemical companies have relentlessly promoted farming systems aimed at making farmers dependent on synthetic chemicals. With the enthusiastic support and complicity of USDA, the plan worked beautifully. In the U.S., the use of chemical pesticides grew 33-fold from 1945, peaking at 1.1 billion pounds (about 4.4 pounds per year for each man, woman and child) in 1995.1 Now with growing numbers of pesticide-resistant insects, and consumers better-informed about the dangers of pesticide residues on food, Monsanto acknowledges that "current agricultural technology is not sustainable," as their most recent annual report puts it. Now Monsanto is planning to shift American farmers from the pesticide treadmill to a biotech treadmill.

** For thousands of years, farmers have saved a portion of this...
year's crop to provide seeds for next year's crop. Monsanto intends to end that age-old practice by requiring farmers to come back to them each year to purchase new seeds. Potatoes are not grown from seeds -- they are grown by planting "eyes" of other potatoes. Before you buy a bag of Monsanto's pesticidal potatoes you must sign a contract promising that you will not retain any of your potatoes toward next year's crop. This will force you to purchase more potatoes from Monsanto next year. According to the TIMES, Monsanto is using informants and Pinkertons, and has brought legal action against hundreds of farmers, to enforce its contract rights.

To tighten the noose on farmers, Monsanto has a new technology in the pipeline, called "the Terminator."[3] Terminator technology was developed with public funds by U.S. Department of Agriculture (USDA) and a seed company that Monsanto is in the process of buying. The Terminator is a group of genes that can be spliced into any crop plant, sterilizing all of the plant's seeds. Once Terminator technology has been widely adopted, control of seed production will move from the farmer's field to corporate headquarters and farmers will become wholly dependent upon corporations for seeds. As the TIMES summarized it, "The Terminator will allow companies like Monsanto to privatize one of the last great commons in nature -- the genetics of the crop plants that civilization has developed over the past 10,000 years." Brilliant and ruthless.

** In a multi-million-dollar advertising campaign in Europe, Africa and the United States, Monsanto claims that its new emphasis on genetic engineering is aimed at feeding the world's hungry and saving the environment from pesticides of the kind it has produced in megaton quantities for the past 40 years.[2] However, the TIMES offered insights into genetic engineering that make Monsanto's new path seem at least as destructive as its old path, and perhaps considerably worse.

** Monsanto says that its genetic manipulations are providing the "operating system" for running a new generation of plants. But the analogy breaks down quickly. A computer operating system, like DOS or Windows or Unix, is fully understandable by the programmers who wrote the code. On the other hand, the genetic code was written by the Creator and no human --- or group of humans --- understands even a small fraction of it. Putting genetically-engineered plants and animals into the natural environment is nothing more than a crap shoot --- one with potential consequences far greater than Monsanto's previous calamitous experiments, polychlorinated biphenyls (PCBs) and Agent Orange.[3]

** The TIMES says that, to create its New Leaf Superior pesticidal potatoes, Monsanto has had to introduce the Bt gene into thousands of potatoes to get it right because often the introduced gene ends up in an unexpected place in the potato's DNA, creating a plant that doesn't have the right pesticidal properties, or one that is an outright freak. "There's still a lot we don't understand about gene expression," says David Stark, co-director of Naturemark, Monsanto's potato subsidiary, in a monumental understatement.

** Richard Lewontin, a Harvard geneticist, told the NEW YORK TIMES that Monsanto's comparison of genetically engineered plants to an "operating system" isn't the right comparison. Instead, Lewontin said, the genetic code is more like an ecosystem. "You can always intervene and change something in it, but there's no way of knowing what all the downstream effects will be or how it might affect the environment. We have such a miserably poor understanding of how the organism develops from its DNA that I would be surprised if we don't get one rude shock after another," Lewontin said.

--Peter Montague (National Writers Union, UAW Local 1981/AFL-CIO)


[3] THE ECOLOGIST magazine devoted its most recent issue to Monsanto; see "The Monsanto Files; Can We Survive Genetic Engineering?" THE ECOLOGIST Vol. 28, No. 5 (Sept./Oct., 1998), pgs. 249-324. E-mail: ecologist@gn.apc.org.

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