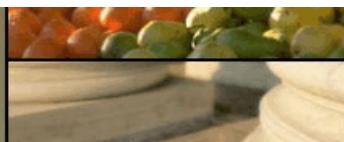


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by

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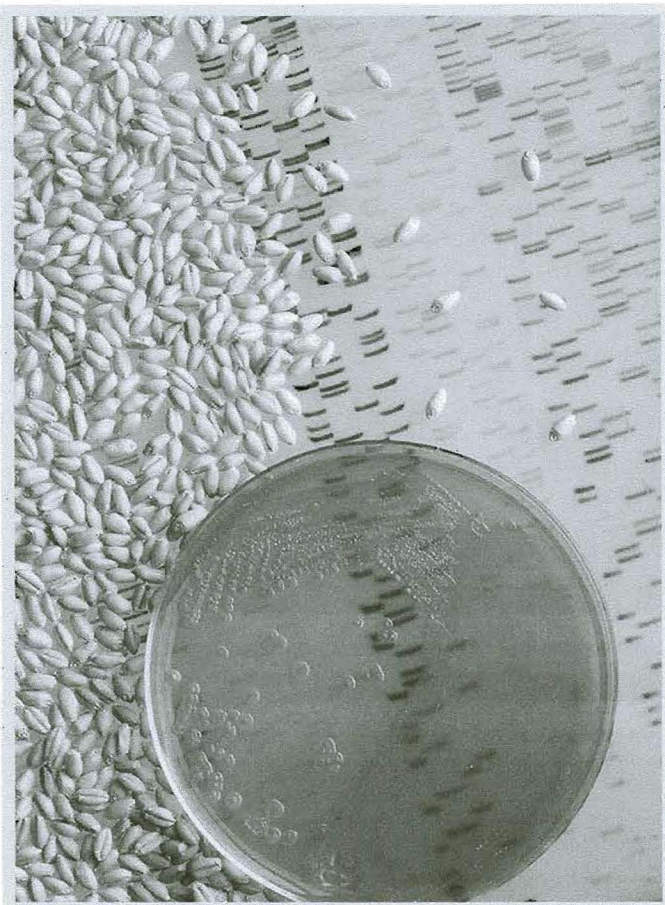
# Pesticides and Genetic Drift: Alternative Property Rights Scenarios

By David S. Conner

Should consumers have the right to consume food free of pesticides and genetic engineering (GE, also called “product of modern biotechnology”)? Should farmers have the right to produce them? Do current standards provide adequate choice to producers and consumers as to what kinds of foods they prefer? This paper will explore the issue of competing rights between conventional versus organic or GE-free producers and consumers within a property rights framework and argue for greater regulatory emphasis on the outcome (product standard) rather than how it was produced (process standard).

Pesticides and GE are topics of much interest in today’s food and agriculture system. Segments of consumers have expressed willingness to pay to avoid them (Bagnara, 1996; Lusk, Daniel, Mark and Lusk, 2001). The use of both is prohibited in organic production methods by the United States Department of Agriculture’s (USDA) National Organic Program (NOP); aversion to these inputs is a key consumer motivation for buying organic food (Conner, 2002), one of the fastest-growing segments of agriculture.

This issue is currently governed by process rather than product standards. Regulations for organic certification state that these substances cannot be used in production, processing, or handling. The NOP rule does not preclude the presence of these substances. In fact, it may be difficult or impossible to find any foods that are completely free of one or the other. The NOP requires organic producers to maintain buffer zones of sufficient size or other features (e.g., windbreak or diversion ditch) to prevent contamination of their fields. Recommended buffer zones (for GE producers) have also been established for a number of GE crops. For example, a distance of 50 meters is required for rapeseed and maize unless the adjacent



field is organic (200 m). However, these buffers do not completely prevent drift and contamination. Events such as the recent contamination of maize seed stock at the Mesoamerican Center of Genetic Diversity in Mexico indicate that these process standards are either ineffective or inadequately enforced.

The current policy environment suggests an implicit property rights assignment: (conventional) producers can use these inputs within a set of rules on proper use and handling; in contrast, consumers

and producers do not have the right to consume or grow products completely free of these substances. As long as the producers follow legal guidelines, no producer or consumer has recourse in case of contamination.

A possible justification of this stance is that U.S. regulatory agencies have determined that the risk of harm from trace amounts of pesticide contaminants is outweighed by the benefits of their use; GE crops have been determined to be "substantially equivalent" to non-GE crops. Concerned consumers and producers can combine to create niche markets for foods not produced with these substances. To various extents government will verify such voluntary claims. Furthermore, the "right to XYZ-free" status could be taken to absurd ends: I violate your right to pollution-free air every time I turn on the heat or flip a light switch. Generally, negative property rights ("freedom from...") are more difficult to enforce than positive ("right to...") ones.

On the other hand, even assuming that aversion to pesticide residues or GE foods is irrational and unscientific, should people still have the right to contaminant-free food? Many food preferences cannot be substantiated by science. Is there a scientific reason why meat and dairy (given modern sanitation practices) should not be mixed, as Kosher rules demand? Or that goats slaughtered in the Halal manner are better than ordinary goats? Would a small amount of non-Kosher or non-Halal food be detectable by a Jew or Muslim? Would it hurt him or her to eat it? The answers to those questions are most likely "no," but imagine the outrage it would cause if suddenly some external force made it impossible to completely maintain Kosher or Halal laws (either in the process or the outcome). Furthermore, many processes or technologies (e.g., nuclear energy, DDT, thalidomide) were at first deemed safe by prevailing scientific opinion and government regulation, but later found to be dangerous.

Since the proverbial horse is out of the barn, we cannot go back in time and decontaminate all foods, fields, watersheds, and so forth. However, a discussion of the implications for a reversal in the property rights environment—where growers or input producers are liable for contamination—highlights key issues and helps to guide future policy actions. How would this be played out, versus

the current regime, in Coase's framework of bilateral bargaining?

Imagine the following hypothetical dispute between Cameron Conventional and Olivia Organic, two farmers with adjacent fields. Cameron is a cutting-edge, high-tech farmer, an early adopter of new technologies, making him a low-cost producer of grains and legumes. "Back to the land" Olivia grows organic specialty crops for sale at a local farmers' market.

Someone tests an ear of Olivia's sweet corn and determines that it is contaminated by pesticides and pollen from GE corn. Her upset consumers begin to boycott her. The belief that she is an organic producer is stripped away. She must now sell her produce conventionally at a much lower price. What are her options?

In the famous framework proposed by Coase (1960), the outcome depends on whose enterprise is worth more, regardless of the property right assignment. Property rights only determine who wins and who loses. (See Frank, 1997, chapter 17, for many examples using this kind of analysis.) If Olivia gains more from selling organic than Cameron gains from using pesticides or GMOs (scenario A), then he will stop using these inputs. If Cameron gains more, Olivia will continue only as a conventional producer (scenario B).

The different policy rights determine who is compensated and who pays. Consider two possible regimes: producers have the right to use these inputs (regime I); or producers can grow residue-free food (regime II). Suppose Olivia's organic reputation is worth more than Cameron's inputs use (scenario A). Under regime I, she will pay Cameron to stop using them and continue to grow organically. Under regime II, Cameron will stop using them because they contaminated her field and he will receive no compensation.

If Cameron gains more than Olivia loses (scenario B), then under regime I, she must relocate her farm or discontinue organic methods with no compensation. Under regime II, he will compensate her for lost income and continue to use the input (see summary in Table 1). Of course, these outcomes assume that each actor seeks to maximize profit. Olivia may balk at Cameron's payment as a matter of principle if she is a true believer in the environmental and social benefits of organic agriculture.

**Table 1.** Summary of outcomes under different situations.

|   | <b>Regime I: Producers have right to use inputs (i.e., Cameron is not liable for trespass)</b> | <b>Regime II: Producers have right to grow contaminant-free food (i.e., Cameron is liable for trespass)</b> |
|---|--|---|
| <b>Scenario A: Olivia's enterprise is worth more</b>  | Olivia pays Cameron to stop using pesticides and GMOs  | Cameron must stop using pesticides/GMOs   |
| <b>Scenario B: Cameron's Enterprise is worth more</b> | Olivia moves away or must sell as conventional   | Cameron compensates Olivia for losses and continues to use pesticides/GMOs                                  |

Regime I essentially implies process standards; regime II, product standards. Regime II could also have the following provisions: process standards, guided by research, will determine the necessary limitations to pesticide use and buffer zones or other containment measures for GE crops. The farmer is liable if he or she fails to comply with these regulations. If the farmer does comply and contamination still occurs, the manufacturer is liable. A tracking or marking system for pesticides and GE crops would be needed to identify the source of contamination. Liability for trespass has been on the agenda of the sustainable agriculture movement for some time, with little success.

Under the status quo (regime I), GE pollen drift will likely be resolved by a maximum allowance of GE content (e.g., 1% is the standard in the European Union for GE-free foods). Alternatively, we could enact policy similar to the NOP rule: seeds specifically bred and known to be GE cannot be used by organic growers, thus legitimizing voluntary GE-free claims. In a sense, consumers buying organic food are paying farmers for not using those products.

The above Cameron and Olivia example is simple. Most grievances cannot be solved so simply, due to unknown benefit distributions, high transaction costs, and difficulty in arranging agreements between large groups. However, such a monumental change in property rights, from "freedom-to-use" to "freedom-from-contamination," has occurred for secondhand tobacco smoke exposure. Many states and municipalities have passed laws to limit smokers' rights and create the right to smoke-free areas.

Issues of food purity, GE, and pesticide contamination are likely to be of increasing relevance as today's consumers' demand shifts from issues of quantity to quality. Presumably, consumers of organic and GE-free foods would prefer these products be truly free of contaminants, but they are

unable to express this demand in the marketplace within the current policy and property rights regime. It is the outcome, not the procedure, which matters to them; therefore, process standards, as their current form, are inadequate. Product standards and the ensuing right to buy and consume "pure" foods are the best way to address this missing market. Furthermore, establishing truly GE-free regions and seed sources may serve as an important safeguard should this technology prove to be less safe than currently thought. More public debate of the issue and research into the welfare impacts of each policy regime are needed to ensure that land resources are optimally allocated.

### For More Information

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