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A FREE-MARKET ENVIRONMENTALIST APPROACH TO GENETICALLY ENGINEERED FOODS

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THE ISSUE

While approximately 800 million people suffer from starvation, much controversy exists concerning the ability of genetically engineered crops to assist in the eradication of hunger.¹ Many anti-market environmental groups claim that further development and distribution of genetically engineered crops will not eliminate world hunger but rather create more disastrous problems for humanity and the environment. Some of these potential problems cited by anti-market environmentalists include: (1) increased costs of farming for farmers in undeveloped countries, which will lead to greater control over the food supply by multinational corporations; (2) increased pesticide use, which may lead to human health problems and environmental pollution; and (3) the creation of mutant crops, or crops that could never occur naturally in nature, which leads to monoculture, or extinction of natural plant varieties. Because anti-market environmentalists believe that “Capitalist greed causes pollution and that

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¹ See Greenpeace Report, *Can Genetic Engineering Feed the World?*, available at <http://www.greenpeaceusa.org/multimedia/download/1/544171/0/361> (last visited Mar. 14, 2005). Agence France-Presse in the article, “Agency Puts Hunger No. 1 on List of World’s Top Health Risks,” explains that worldwide, the lack of food causes 3.4 million deaths in 2000 and about 170 million children in poor countries are underweight because of lack of food. Agence France-Presse, *Agency Puts Hunger No. 1 on List of World’s Top Health Risks*, N.Y. TIMES, Oct. 31, 2004, at A9.

high profits come at the expense of the environment,”² they advocate the intervention of government – either through regulation or eradication of the genetic engineering industry to correct this so-called market failure. However, we will argue that the market process through voluntary exchange, upheld property rights, and full incorporation of both the costs and benefits of a venture would counter the potential problems cited by opponents of the genetic engineering industry. For example, Anderson and Leal hold that, “Market processes can be compatible with good resource stewardship and environmental quality.”³ Moreover, free market environmentalism would significantly reduce the occurrence of the above-mentioned problems associated with environmental misbehavior and advocate government intervention only to uphold private property rights.⁴

BACKGROUND

First, one must understand the meaning of the term “genetically engineered.” Doug Sherman and Gregory Jaffe, co-directors of the Biotechnology Project at the Center for Science in the Public Interest,

² Lloyd D. Orr, *Social Cost, Incentive Structures and Environmental Policies*, reprinted in *BUREAUCRACY VS. ENVIRONMENT: THE ENVIRONMENTAL COSTS OF BUREAUCRATIC GOVERNANCE* 50 (John Baden & Richard L. Stroup eds., University of Michigan Press 1981).

³ TERRY L. ANDERSON & DONALD R. LEAL, *FREE MARKET ENVIRONMENTALISM* 6 (Pacific Research Institute for Public Policy 1991).

⁴ An anti market environmentalist is someone who claims he favors environmental protection, but sees as the best means toward this end governmental control and/or ownership over vast tracts of land, and heavy state regulation of the remainder. See BARRY COMMONER, *MAKING PEACE WITH THE PLANET* (Pantheon Books 1990); PAUL EHRLICH & ANNE EHRLICH, *EXTINCTION: THE CAUSES AND CONSEQUENCES OF THE DISAPPEARANCE OF SPECIES* (Random House 1981); PAUL EHRLICH, *THE POPULATION BOMB* (Ballantine Books 1968); AL GORE, *EARTH IN THE BALANCE: ECOLOGY AND THE HUMAN SPIRIT* (Plume 1993). *But see* ANDERSON & LEAL, *supra* note 3; BJORN LOMBORG, *THE SKEPTICAL ENVIRONMENTALIST: MEASURING THE REAL STATE OF THE WORLD* (Cambridge University Press 2001); Murray N. Rothbard, *Law, Property Rights, and Air Pollution*, in *ECONOMICS AND THE ENVIRONMENT: A RECONCILIATION* 233-79 (Walter Block ed., The Fraser Institute 1990); JULIAN L. SIMON, *THE ULTIMATE RESOURCE* (Princeton University Press 1981); Richard L. Stroup, *Economics: What Everyone Should Know About Economics and the Environment*, Cato Institute, available at http://www.buckeyeinstitute.org/Articles/2003_10_24Burnett.htm (2003).

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define genetic engineering as “remov[ing] genes from one organism – a plant, animal, or microbe – and transferring them to another. Most genes are simply codes, or blueprints, that tell a cell to make a protein.”⁵ Furthermore, this transfer of genes gives the plant some desirable trait.

In addition, biotechnology scientists already have genetically engineered plants that require significantly less pesticide due to the integration of transforming genes from other plants that fend off different types of pests. Sherman and Jaffe explain that “companies are working on developing fruit that can be picked ripe without becoming mushy, coffee that’s naturally caffeine-free, soybeans that don’t trigger allergic reactions and that contain more healthful omega-3 polyunsaturated fatty acids, golden rice (rice enhanced with vitamin A),”⁶ virus-resistant plants, insect-resistant plants, drought-resistant plants, and fruits and vegetables that contain more nutrients or possibly even vaccines.⁷

One might assume that these companies would receive great support for further development and innovation in light of all the potential benefits; however, many critics exist. For example, Sherman and Jaffe both acknowledge the enormous potential of genetically engineered crops but admit, “we’ll never realize [this potential] unless we make sure farmers in developing countries have access to cheap or free genetically-engineered seeds, that the crops don’t harm the local environment, and that the foods are safe.”⁸ These critics of genetic engineering companies

⁵ Center For Science in the Public Interest, Nutrition Action Health Letter, *Genetically Engineered Foods: Are They Safe?* (Nov. 2001), at http://www.cspinet.org/nah/11_01/.

⁶ *Id.* An estimated half-million children in the world go blind every year because their diets do not contain enough Vitamin A. Millions more die from infectious diseases that their immune systems might have been able to fight off with enough vitamin A. By inserting two genes from a daffodil and one from a bacterium into rice plants, scientists have created rice with beta-carotene, which the body turns into vitamin A. *Id.*

⁷ *Id.*

⁸ *Id.*

worry that “multinational corporations that sell the ‘miracle seeds’ are in business to make money, not feed the world,”⁹ - and these critics are right.

IMPLICATIONS

Companies invest into research and development because they hope to acquire returns in the future. Entrepreneurs are motivated by self-interest in the market sphere rather than altruism but this does not imply that the entire economy does not benefit.¹⁰ However, when critics argue that this technology should be handed out for free, they ignore the very basis behind the entrepreneurial spirit, which fosters technology and innovation. Adam Smith’s (1776) “invisible hand” demonstrates that trade is not a zero-sum game as these critics claim¹¹. Although altruism does not represent the fundamental motivation behind genetic engineering, this technology can deliver better crops with higher yields at a lower cost, which may further assist in feeding the world. When these companies sell their “miracle seeds” they exchange their product for a monetary price, namely revenue, and the consumers exchange their money for these products. Neither the producers nor the consumers would voluntarily exchange their property rights, if both did not feel that they would benefit from the exchange. The very act of voluntary exchange illustrates that each party gives up something because they value the item received in

⁹ *Id.*

¹⁰ ANDERSON & LEAL, *supra* note 3, at 4-5. Leal and Anderson note that free market environmentalism is founded on certain visions regarding human nature, knowledge, and processes. With respect to human nature, free market environmentalism views man as self-interested. This self-interest may be enlightened to the extent that people are capable of setting aside their own well-being for close relatives and friends or that they may be conditioned by moral principles. But beyond this, good intentions will not suffice to produce good results. Instead of intentions, good resource stewardship depends on how well social institutions harness self-interest through individual incentives.

¹¹ ADAM SMITH, *INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS* 423 (Modern Library 1937). David Ricardo is usually credited for the concept of comparative advantage. See DAVID RICARDO, *THE PRINCIPLES OF POLITICAL ECONOMY* (J.M. Dent 1912) (1891), available at <http://www.econlib.org/library/Ricardo/ricP.html>.

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exchange greater than the item given up; thus, both parties benefit. Hence, voluntary exchange denotes a positive sum game.

Related to this argument against multinational corporations that control the seed supply, critics argue that genetically engineered crops exported from the Northern developed countries will worsen the provision of food. Critics, such as Greenpeace, argue that “sold at prices far below the cost of production, this export-driven policy has put local farmers in Southern countries out of business - making more people poorer and creating a dependence on food imported from the North.”¹²

However, this argument contains faulty logic. First, if corporations sold their genetically engineered seeds below the cost of production, they could never survive by incurring losses. Rather more likely these corporations sell their seeds, produced by economies of scale, at prices far below the cost of production in those undeveloped countries. If this is the case, inhabitants of these underdeveloped countries should be thankful for the supply of an inexpensive or less expensive food supply. After all, if people suffer from hunger because they can not afford to grow enough food to sustain themselves, the introduction of lower priced agricultural products will grant more people the ability to buy food and those who had the ability to buy sufficient amounts prior to the introduction of the inexpensive crops will now possess the ability to buy even more.¹³

Greenpeace assumes that poverty will not cease unless

M[ore] family farmers produc[e] sustainable crops, not less. Bumper crops in the North have resulted in low prices, driving family farmers in the North out of business. Surpluses sent to countries in need of food are sold at

¹² Greenpeace Report, *supra* note 1, available at <http://www.greenpeaceusa.org/multimedia/download/1/544171/0/361>.

¹³ *Id.* A far more likely explanation of low food prices, a phenomenon that Greenpeace mistakenly blames on multinational corporations, are agricultural export subsidies in the United States and the EU. We owe this point to Glenn Fox.

ridiculously low prices, driving family farmers in those areas out of business, also.¹⁴

If people are in dire need of food, how can an organization claim that the prices of the food supply are ridiculously low? It seems hypocritical to advocate higher food prices charged to starving people to support inefficient family farmers. The free-market's fail-safe mechanism rewards efficient producers and penalizes inefficient producers. Therefore, if farming activities in undeveloped countries entail less efficient methods of production at higher costs, these farmers should devote their time and energy to economic activities where they have a comparative advantage. While technology often receives condemnation because of its displacement of outdated industries and its workers, opponents fail to see the creation of a new industry and its need for new workers to maintain it. Furthermore, technology and innovation lead to more efficient, less costly methods of production, which therefore pass the savings onto the consumer via a lower price.

Further entwined with the criticism of multinational corporations controlling the seed supply is the criticism that too little regulation oversees these industries and therefore these industries may produce unsafe crops. However, entrepreneurs are guided by the market's fail-safe mechanism, where competent entrepreneurs receive compensation via increased wealth and incompetent entrepreneurs, those who make bad decisions and misallocate resources, receive penalties via losses until ultimately that inefficient firm is driven out of the market. Therefore, companies have every incentive¹⁵ to produce safe, genetically engineered crops.

¹⁴ *Id.*

¹⁵ The counter argument to this is the claim that this is the case only if decision makers are faced with all of the costs and benefits of their decisions. Opponents of GM believe

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However, the article “Better dead than GM-fed?” of The Economist illustrates the skepticism of desperately poor countries to accept genetically engineered crops.¹⁶ Although 14.5 million people in Southern Africa are dangerously hungry and many have been reduced to eating wild leaves and pig food, Southern Africans refuse to import genetically modified food.¹⁷ The Economist depicts the irony of the situation: “Americans have been chomping GM maize and soybeans for seven years, without detectable harm. And compared with the clear and immediate danger posed by malnutrition, the possibility of being poisoned by Frankencorn seems rather remote.”¹⁸

Furthermore, when asked if we should be nervous about eating food that contains genes from other organisms, Sherman and Jaffe explain that often we aren’t eating those genes due to the processing of the crop. This is illustrated by corn processed into corn oil or high fructose corn syrup. Moreover, most crops that we buy in the supermarket have undergone genetic alteration through breeding with wild relatives. However, this process of hybridization has occurred for thousands of years. While Gore admits, “...this is not to say that plant selection is inherently dangerous; on the contrary, it is one of history’s greatest innovations...indeed, plant breeding is almost as old as civilization

there is a substantial risk from this technology not borne by decision makers. But surely “caveat emptor” puts paid to this notion. That is, all supposed externalities are internalized by that fact that there is a willing seller, and a willing buyer, where the latter bears the risk of any unforeseen developments. Were this not the case, then we would be at sea without a rudder: anyone could argue anything he wanted, with no limit. For example, perhaps the relevant costs of Frisbees are not taken into account. Who knows what evils lurk in the handling of this plastic toy?

¹⁶ Economist.com, *Better Dead than GM-fed?* (Sept. 19, 2002), at http://www.economist.com/science/displayStory.cfm?story_id=1337197.

¹⁷ *Id.*

¹⁸ *Id.*

itself.”¹⁹ He regrets that “we have now taken the ancient process of seed and plant selection to a technological extreme . . .”²⁰ Sherman and Jaffe also add “this traditional cross-breeding often produces foods that contain genes and proteins that people have never been exposed to before. And, like it or not, we’re constantly eating the genes and proteins of harmless bacteria that inadvertently end up on our food.”²¹ Ultimately, when an entrepreneur responds to an open niche in the market and invests into one’s idea, that individual must incorporate all of the benefits and costs of one’s decisions – included in those costs are safety issues.

Anti-market environmentalists also claim that genetically engineered crops will lead to greater environmental pollution. Because they view this possible outcome as a market failure, these opponents are quick to advocate government regulation or elimination of the genetic engineering industry. Although Saign admits “it is unknown whether biotech animals and plants, if released into nature, would alter the environment or food chains in a way that is detrimental to humans,”²² he still argues that government should “[c]reate an independent interdisciplinary ethics advisory board for the biotech industry... [I]ncrease support for small and mid-size farmers; expand subsidies... for organic and sustainable farmers, [m]andate that biotech food products receive long-term health testing..., and [b]an all pesticides and herbicides until they are tested for long-term health effects.”²³

However, these critics fail to realize that what they deem as market failures in reality constitute government failures. Neither individuals nor

¹⁹ AL GORE, *EARTH IN THE BALANCE: ECOLOGY AND THE HUMAN SPIRIT* (Plume 1993), at 129-30.

²⁰ *Id.* at 130.

²¹ Center For Science in the Public Interest, *supra* note 5.

²² GEOFFREY SAIGN, *GREEN ESSENTIALS: WHAT YOU NEED TO KNOW ABOUT THE ENVIRONMENT* 37 (Mercury House 1994).

²³ *Id.* at 41.

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corporations should invade the private property of others. As Machan asserts, “the tragedy of the commons arising from environmental pollution can be translated as the failure to extend the concept of rights into new domains.”²⁴ Therefore, if the government correctly upheld private property rights, both individuals and corporations would have to incorporate the cost of pollution into their decisions, where this cost would include both damages and injunctions. Yandle adds, “why not hold the polluter responsible for common law violation of adjoining environmental rights and either shut the polluter down or make the polluter pay damages?”²⁵

Advocating government regulation through the political process disregards the fact that politicians and bureaucrats too are self-interested, they receive rewards through responding to political pressure groups and expanding their agency size and budgets. Moreover, arguing for a distant third party to manage environmental issues neglects the fact those individuals concerned with the protection of their own private property rights are more often better equipped to make decisions that coincide with good resource stewardship. Benjamin adds:

²⁴ TIBOR MACHAN, *CAPITALISM AND INDIVIDUALISM: REFRAMING THE ARGUMENT FOR THE FREE SOCIETY* 164 (St. Martin’s Press 1990).

²⁵ Bruce Yandle, *Public Choice and the Environment: From the Frying Pan to the Fire*, in *POLITICAL ENVIRONMENTALISM: GOING BEHIND THE GREEN CURTAIN* 31 (Terry L. Anderson, ed., Hoover Institution Press 2000). It is sometimes asserted by opponents of free market environmentalism that genetically modified foods would lead to unwarranted spill over problems. The classical case of this is smoke pollution. But external diseconomies like pollution are evidence of government failure to uphold private property rights against encroaching distributors of trespassing smoke particles. See Murray N. Rothbard, *Law, Property Rights, and Air Pollution*, in *ECONOMICS AND THE ENVIRONMENT: A RECONCILIATION*, at 233-79 (Walter Block ed., The Fraser Institute 1990); MORTON J. HORWITZ, *THE TRANSFORMATION OF AMERICAN LAW: 1780-1860* (Harvard University Press 1977); Robert W. McGee and Walter E. Block, *Pollution Trading Permits as a Form of Market Socialism and the Search for a Real Market Solution to Environmental Pollution*, 6 *FORDHAM ENVTL. L.J.* 51 (1994). Nothing of the sort can even be imagined, let alone proven, in the case under discussion.

It is tempting to conclude, as some have done, that because people may be prone to error in risk assessment, experts should make assessments on behalf of people who would otherwise err... I would argue that only people who bear the consequences of decisions can fully know the advantages and disadvantages of each expert decision.²⁶

We must admit that not only do experts err, disagree with each other, and that evidence is sometimes ambiguous, but also that experts who work for bureaucracies “have the same goals as the rest of us, they want higher incomes, promotions, discretionary authority, security, and a variety of work place amenities.”²⁷

Many anti-market environmentalists view technical innovation as the cause of our environmental and natural resource problems; however, Orr sheds light on the actual nature of technology – its neutrality: “If technology goes astray, it is because society gives the wrong signals to its managers about what it wants to conserve. If the signal is that environmental resources are free, we should not be surprised to find a technical response that leads to their profligate use.”²⁸

With respect to monoculture, anti-market environmentalists fear that genetic engineering will eliminate biodiversity. Therefore, just as Saign advocates the creation of bureaucracies to regulate this industry, Gore expresses his concerns by stating “[w]hen we intervene in the

²⁶ Daniel K. Benjamin, *Risky Business: Rational Ignorance in Assessing Environmental Hazards*, in Roger Meiner & Bruce Yandle, *Taking the Environment Seriously* 224 (Rowman & Littlefield Publishers, Inc. 1993).

²⁷ Bruce M. Johnson, *The Environmental Costs of Bureaucratic Governance: Theory and Cases*, in BUREAUCRACY VS. ENVIRONMENT: THE ENVIRONMENTAL COSTS OF BUREAUCRATIC GOVERNANCE 217 (John Baden & Richard L. Stroup eds., University of Michigan Press 1981).

²⁸ Orr, *supra* note 2, at 50. “Since many environmentalists believe that environmental amenities should be free to all, they support and promote programs intended to produce environmental amenities free of user charges. Furthermore, when the prices of environmental goods are set at zero, a certain dynamic process sets in motion. The public believes the environmental goods are free and, as a consequence, rationally demands that still more goods be produced. Why not, it’s free?” Johnson, *supra* note 28, at 221.

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process of evolution by directing the selection of those genetic characteristics that will be passed on from one generation to the next, the choices are usually based on the maximum yield and current market value of the varieties in question rather than their overall genetic resilience.”²⁹

However, Gore ignores the fact that entrepreneurs do not concern themselves solely with the current market value of their investments, but rather the present discounted value, which incorporates all future revenues to be generated by the investment. Therefore, entrepreneurs will assess the risk of blight, drought, and pests devastating their investments. Moreover, our market system, which encourages specialization and division of labor, provides us with greater diversity than ever imaginable in the absence of a free-market system. Likewise, Gore notes, “most of us no longer produce our own food, but rely instead on a huge and complex apparatus that places an amazing variety of foods from every corner of the world in our supermarkets.”³⁰ Through the free-market system, an individual decides for oneself what to specialize in and through the coordination of markets the invisible hand leads to diversification.

CONCLUDING REMARKS

Although this paper has supported the genetic engineering industry, it does not neglect the importance of choice. Therefore, if segments of the public prefer organic crops to genetically engineered crops, then the market will ensure that they receive organic crops for “profits link self-interest with good resource management by attracting entrepreneurs to open niches.”³¹ However, to advocate government regulation or elimination of an industry, because certain interest groups dislike the nature of a certain industry, interferes with the choice of others.

²⁹ GORE, *supra* note 20, at 129.

³⁰ GORE, *supra* note 20, at 126.

³¹ ANDERSON & LEAL, *supra* note 3, at 6.

As Machan points out, “[a] crucial aspect of the thesis that human beings are moral agents is that human beings are able to make fundamental choices in life; that they possess free will and are the ultimate cause of their most important actions.”³² Therefore, the free-market system, unhindered, will allow those individuals who would like to buy cheaper, genetically engineered food, to do so, while others who detest the idea can opt to buy organic foods.

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³² MACHAN, *supra* note 25, at 155.

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