

Legal and Technological Measures to Prevent Farmers from Saving Seed and Breeding Their Own Plant Varieties

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The Rural Advancement Foundation International (RAFI) is an international civil society organization, headquartered in Canada, with an affiliate office in Pittsboro, North Carolina (USA). We work primarily at the international policy level. RAFI is concerned about the loss of biological diversity—especially in agriculture—and about the impact of intellectual property on farmers and world food security. We also conduct research on the social and economic impacts of biotechnology on agriculture and farm communities. Our staff has campaigned against Plant Breeders Rights and other forms of plant intellectual property since 1980. We believe that monopoly control over plants, animals, and other life forms jeopardizes world food security, undermines conservation and use of biological diversity, and threatens to further marginalize the world's poor.

CHALLENGES TO AGRICULTURAL BIODIVERSITY

I'd like to mention just three trends that we see as major challenges facing conservation and sustainable use of agricultural biodiversity. The first trend, and probably the most obvious one, is *genetic erosion*. We're losing genetic resources for agriculture at an unprecedented rate. What's at stake is the biological basis for world food security. Forests are falling, fisheries are collapsing, plant and animal genetic diversity is eroding all over the world. The statistics are sobering:

- Crop genetic resources are disappearing at the rate of 1–2% per annum.
- Domestic animal breeds are disappearing at an annual rate of 5%, or 6 breeds per month. FAO considers 30% of all livestock breeds endangered or critical.
- Tropical forests are falling at a rate of just under 1% per annum, or 29 hectares per minute (CGIAR 1996). From 1980–1990, this is equivalent to an area the size of Ecuador and Peru combined.
- All of the world's main fishing grounds are being fished at or beyond their limits. About 70% of the world's conventional marine species are fully exploited, overexploited, depleted or in the process of recovering from over fishing (FAO 1995). During this century, about 980 fish species have become threatened (CGIAR 1998).

The loss of biodiversity threatens global food security, especially for the poor, who rely on biodiversity for 85 to 90% of their livelihood needs.

The second trend I'd like to mention is privatization of plant breeding and seed sales. The first half of 1998 witnessed a dramatic consolidation of power over plant genetic resources worldwide, a trend that began over three decades ago. The global seed trade is now dominated by "life industry" corporations whose vast economic power has effectively marginalized the role of public sector plant breeding and research. Of course, the consolidation trend is not just in seeds but in all sectors of the life industry.

- 20 years ago there were thousands of seed companies, most of which were small and family owned. Today, the top 10 global seed companies control 30% of the \$23 billion commercial seed trade.
- 20 years ago RAFI was monitoring about 65 agrochemical companies involved in the development of new crop chemicals. Today the top 10 pesticide manufacturers account for 82% of the \$30 billion dollar global market.
- Two decades ago, the top 20 global pharmaceutical companies controlled roughly 5% of the global pharmaceutical trade. Today, the top 10 pharmaceutical companies account for 36% of the \$251 billion global pharmaceutical market.
- Today, the top 10 firms held 61% of the animal veterinary market valued at (US) \$16 billion.

If you look at the dominant companies in all of these sectors—in plant breeding, pesticides, veterinary medicines, and pharmaceuticals—you'll find that many of the same companies are dominant in all of these sectors. Companies such as Monsanto, Novartis, Dow, and Dupont are everywhere.

The bottom line is that fewer and fewer companies are making critical decisions about the agricultural research agenda, and the future of agriculture worldwide. With the advent of genetic engineering life industry

corporations are staking far-reaching claims of ownership over a vast array of living organisms and biological processes. The power of exclusive monopoly patents is giving these companies the legal right to determine who gets access to proprietary science and at what price. This has serious implications for the future of world food security and for conservation of genetic resources.

The third trend I want to mention has to do with farmers and their role in conserving and using agricultural biodiversity. The future of world food security depends not just on stored crop genes, but on the people who use and maintain crop genetic diversity on a daily basis. In the long run, the conservation of plant genetic diversity depends not so much on a small number of institutional plant breeders, but on the vast number of farmers who select, improve, and use crop diversity, especially in marginal farming environments. That's why we are particularly alarmed by the current trend to eliminate the right of farmers to save and exchange seed, and breed their own crops. Both public and private sector institutions are using, developing, and promoting a variety of legal and technological tools that are designed to give the seed industry greater control over plant genetics and eliminate the right of farmers to save and re-plant seed from their harvest.

Let me back up a minute to explain, what's so important about the right of farmers to save seeds? Two points: Farmers are not just saving seeds, they are plant breeders who are constantly adapting their crops to specific farming conditions and needs. For over 200 generations, farmers have been selecting seeds and adapting their plants for local use. This genetic diversity is key to maintaining and improving the world's food supply. The second point I want to make is this: No plant breeder or genetic engineer starts from scratch when they develop a new cultivar of maize, or tomato, or barley. They are building on the accumulated success of generations of farmers, who have selected and improved seeds for thousands of years. Companies like Dupont and Monsanto and Novartis tell us that they 'invented' their genetically engineered plants and that they should be rewarded with exclusive monopoly patents. In reality, corporate plant breeders are fine-tuning and modifying plants that were developed by anonymous farmers and the more recent contributions of institutional plant breeders.

Intellectual property regimes have evolved very rapidly. Eighteen years ago, RAFI testified at Congressional hearings in Washington, DC on US plant variety protection laws—a type of plant patenting. Gary Nabhan also testified at those hearings. We were there to oppose the expansion of these laws, and we argued that, if the seed industry got its way, farmers would *lose* the right to save seeds and that genetic diversity would be threatened. I'll never forget the response we got from the Chairman of the House Agriculture Committee, Kika de la Garza from Texas, he laughed out loud and said, "No one's going to take away the right of farmers and backyard gardeners to save seeds!"

Well, here it is, 1998, and I'm sorry to say that Kika de la Garza was dead wrong. Under US patent law, it's now *illegal* for farmers to save patented seed and re-use it. Today, Monsanto requires farmer's—its customers—to sign a gene licensing agreement before they buy the company's patented, genetically engineered seeds. If farmers are caught infringing the patent, Monsanto is "vigorously prosecuting" them in court. The penalties may include criminal charges, on-farm field inspections, and damages that could exceed \$1 million dollars. In some areas, the company has hired Pinkerton investigators to root-out farmers who are saving Monsanto's patented seed. In other words, farmers are being turned into criminals and rural communities are becoming corporate police states. Monsanto has spent over \$8 billion acquiring seed and biotech companies since 1996, and it's now the second largest seed corporation in the world.

Historically, plant variety protection regimes guaranteed the right of farmers to save seed from their harvest. But the farmers' right or farmers' exemption is disappearing from international plant patenting regimes. Earlier this year, the 1991 Act of UPOV entered into force, replacing the 1978 Act. UPOV is the international body that coordinates a common legal regime for plant variety protection. Under the new Act, the farmers' right to save seed is no longer an automatic feature of the new Convention—it is recognized only if member states make special provision for it in national legislation. This is a big deal because many nations of the South are under intense pressure to join UPOV to satisfy their obligation under GATT-TRIPs.

TERMINATOR TECHNOLOGY

The latest assault on the right of farmers to save seed is a technology developed by USDA and the seed industry. In March of this year the USDA and Delta & Pine Land Co., a Monsanto subsidiary, proudly an-

nounced that they received a patent on a technique that genetically alters seed so that it will not germinate if re-planted the following season. In other words, scientists have developed plants that are genetically engineered to kill their own seeds. The technology is designed to prevent farmers from saving seed from their harvest, thus forcing them to return to the commercial seed market every year. This technology is still in the early stages of development. But, if it works as advertised, it's a dream-come-true for the multinational seed industry. Because we view it as a potentially "lethal" technology, RAFI calls it the "Terminator Technology."

Probably some of you know that RAFI and many other NGOs have adopted a campaign to ban the Terminator. In RAFI's opinion, the Terminator technology is the neutron bomb of agriculture. It's a dead-end for farmers, and for biological diversity. This is a product that will bring *no* agronomic benefit to farmers or consumers—it's designed simply to increase seed industry profits. The technology is aimed primarily at seed markets in Africa, Asia, and Latin America, where over 1.4 billion people depend on farm-saved seed and on-farm plant breeding. Patents on the Terminator technology are pending in 87 foreign countries. The president of Delta & Pine Land, Murray Robinson, says that his company's seed sterilizing technology could be used on up to 1 billion acres (400 million ha) worldwide (an area the size of South Asia), and that it could generate revenues for his company in excess of \$1 billion per annum.

If farmers lose the right to save seed—they lose the ability to select seed and adapt crops to their unique farming conditions. If farmers eat or abandon their traditional seeds in the process of adopting this new technology, centuries of crop genetic diversity will be lost forever.

But that's not all. Scientists warn that, under certain conditions, the trait for seed sterility will flow, via pollen, from Terminator crops to surrounding plants, making the seeds of neighboring plants sterile. Simply put, the Terminator technology will restrict the food-producing capacity of farmers and it will destroy diversity.

The good news is that the highly unpopular Terminator technology has catalyzed international debate on these issues and there's an avalanche of public opposition. Over 2,500 people have written to US Secretary of Agriculture Glickman (from RAFI's web site alone) urging him to cease negotiations with Monsanto on the licensing of the technology, and to abandon development of the technology. Two weeks ago, the world's largest international agricultural research network—the Consultative Group on International Agricultural Research—adopted a policy banning the use of Terminator technology (and other genetic seed sterilization technologies) in its plant breeding programs.

- African delegates to the United Nations FAO have said that they don't want Terminator genes used on African soil.
- In May, the Conference of the Parties to the Convention on Biological Diversity (COP IV) directed its scientific body to examine the technology's impact on farmers and biodiversity.
- India's agriculture minister has taken action to ban the import of seeds containing the terminator gene because of the potential harm to Indian agriculture.

I realize that we're not here to debate the Terminator technology—but I believe the subject is entirely relevant to our discussion tonight. I also know that there are many dedicated and well-meaning scientists at USDA who are doing very important work to support conservation and sustainable use of biodiversity. If the US government is serious about supporting the conservation and sustainable use of biodiversity, then it's sending precisely the *wrong* message by developing a technology that aims to restrict the right of farmers to save seed and select crops. The right to save seed is fundamental to agriculture and global food security. That's the bottom line. If farmers lose the right to save seed, we all lose.

REFERENCES

- CGIAR. 1996. Press Release, "Poor Farmers Could Destroy Half of Remaining Tropical Forest," Washington, DC, 4 August 1998.
- CGIAR. 1998. Statement of the CGIAR to the 4th Meeting of the Conference of Parties to the Convention on Biological Diversity, Bratislava, Slovakia, May, 1998.
- FAO. 1995. The State of World Fisheries and Aquaculture, FAO, Rome, p. 8.