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No to GMO's Civil Society vs Corporate Empire

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Talk presented in Progressive Farm Leaders Summit on Genetic Manipulation and Agriculture, Coalition of Family Farmers, USA, Mannassas, Virginia, September 11, 1999.

Friends and colleagues! It is great to be here with you. As has been made clear by speakers in the previous panel, the issue is not just whether we should accept GM crops. We are involved in the biggest, most inclusive, world-wide civil rights movement of the century, if not the millenium, and it is against the corporate empire that has ruthlessly exploited and ruined all of the earth's resources, to make the rich ever richer, and the poor ever poorer and hungrier. And now, to top it all, the corporate empire is taking possession of life and our life-support system, to use as stakes in a final gamble with a Frankenstein science and technology that has the potential to destroy all life on earth. As some of you will know, the movement has been going on for well over twenty years. I am a late-comer, an ex-ivory tower academic who has been moved and inspired to join in the struggle since 1994.

There are very brave people in the movement, who are accepting arrest and harassment to put our case to our Governments. The destruction of GM field trials in the UK by Genetix Snowball and others has been grabbing the international headlines, but that kind of action started several years ago in Germany. It is now also happening in Ireland, France, India,

Brazil, and I am told, in your country as well. The perpetrators are not the usual eco-warriors, but ordinary citizens like you and me, from all age groups and right across the social spectrum, literally from prince to pauper. I was an expert witness helping to defend seven people who took civil disobedience action against Monsanto's GM test sites in Ireland. Among the seven was a journalist, a lawyer and 84-year old author and organic farmer, John Seymour, who compares the invasion of Ireland by Monsanto's "genetically mutilated" crops to the invasion by the Norman army, and sees it his duty to defend his country. "And if I have to go to prison because of it then I will go with a good will, and make the best of it, and when I get out I will try to stop them again!" The resistance to GM crops is world-wide.

In India, I met angry farmers calling for a ban on GM crops. They burnt the field trials in a "cremate Monsanto" campaign, followed by the "Monsanto quit India" campaign. In the region of South Asia, a large coalition of ngos representing millions of farmers launched a two-prong attack: a resistance campaign directed against all genetic engineering corporations and a seed-saving campaign to save and preserve traditional seeds, which alone can truly feed the hungry people in the world. Similar resistance and seed-saving campaigns are happening elsewhere. A coalition of Latin American ngos have declared they will not accept GM crops. In Brazil, the agricultural minister of the State of Rio Grande do Sul was the first to declare his State GM-free, and a remarkable group of eminent judges and lawyers played a major role in getting Monsanto's GM soya banned from the whole country. Monsanto has appealed three times and failed to get the federal court decision overturned. At the same time, Brazil is drafting biodiversity/biosafety laws in order to protect their genetic resources and indigenous knowledge from biopiracy.

In Japan, three of the largest consumer associations, with membership running into millions and hundreds of thousands, succeeded in getting mandatory labelling of GM products. Tewolde Egziabher of Ethiopia, leading spokesperson of the African Region, has rejected the technology as "neither safe, environmentally friendly, nor economically beneficial." The African Region has taken the lead in drafting the most comprehensive International Biosafety Protocol under the UN Convention on Biological Diversity in order to regulate the use and transport of genetic engineered products. The negotiations broke down in Cartagena, Columbia, this February, blocked by the US and its 5 allies of the Miami Group against the overwhelming majority of the 170 countries who have signed onto the Convention on Biological Diversity. Since then, African countries have been drafting Biosafety Law for the entire region, in order to protect themselves against the dumping of GM crops and products. The European Union has a *de facto* moratorium at least until 2002, but consumer resistance has already led to all major food chains and suppliers to declare themselves GM-free.

Although consumers reject GM products primarily on grounds of safety, farmers do so because of the threat of seed monopoly. Farmers have always depended on saving seeds and replanting them, and 85% of the farmer in the Third World still do so. It is the symbiotic linkage of the human life-cycle to that of crop-plants that perpetuates and propagates both.

Corporate patents are now preventing farmers from saving and replanting under penalty of heavy fines. This comes at a time when, within the past 10 years, many farmers in the Third World have gone back to cultivating and conserving indigenous varieties in all forms of organic, sustainable agriculture, doubling and tripling their yields and improving their livelihood, health and nutrition. They have been reversing the environmentally and socially

destructive trends of the so-called high yielding monocultures of the green revolution, which have brought financial ruin and suicides to thousands in India alone, and for the same reasons it is now happening in US and Europe. The liberalisation of trade and investment under the globalised economy of the World Trade Organisation has effectively allowed corporations to buy when and where it is cheapest and sell at inflated prices, and in addition, undercut farmers by getting the state to subsidise dumping of surpluses. Farmers are reduced to serfs in a feudal system run by corporations.

As a scientist, I have to say that reductionist western science has a lot to answer for. It has been working hand in glove with corporations to bring our planet to the edge of extinction in climate change and a string of ecological disasters. The reason people feel so passionately against genetic engineering biotechnology is because we know, intuitively and intellectually, that living organisms are our last resort, our last remaining hope for regenerating and saving the planet. I saw how organic farmers in India can regenerate land completely laid waste by agrochemicals and industrial chemicals and given up for good. And they did it in just two to three years. In Japan, Takeo Furuno introduced the 'one-bird revolution' ten years ago by releasing ducklings into paddy fields which are complex ecosystems of rice plants, nitrogen-fixing duckweed, roach, daphnia, plankton, and innumerable species of so-called weeds and pests including insects and the golden snail on which the ducklings thrive. I am hopeful that we can reverse the destruction, and convinced that nature's harvest is bountiful to all who, instead of engaging in perpetual warfare against nature, learn how to work in partnership with her.

The corporations stop at nothing to protect their patents and to profiteer. They have even threatened to release the ultimate terminator -- harvested seeds that do not germinate -- thus breaking the very cycle of life. The terminator corporations and their scientists are playing dangerous games with the natural resilience and fecundity of life which are also needed to reverse the destruction and to regenerate the earth.

The power for regeneration is in the seed. It is also in the will of each and everyone of us who cares, who, for the love of life and nature, works for a better, more equitable and compassionate world. The power for regeneration is especially in the farmer who understands how to work with holistic, organic nature. Organic farmers everywhere are poets. Charles McGuire in Ireland tells me, "When I walk into my fields, I can feel the earth singing to me." Sultan Ismail in India says, "The soil is a living organism. We have placental connections with the soil." and "Trees are poems that the earth writes in the sky, But we cut them down to fill our emptiness."

What I find most encouraging as a scientist is that after centuries of reductionist, mechanistic thought, contemporary western science is finally re-discovering and re-instating the same view of holistic, organic nature that many indigenous cultures in the world have never lost touch with.

Unfortunately, mainstream biology is left far behind. It has no appreciation of interconnected nature. It has no concept of an organism as a whole. It thinks it can improve on nature by arbitrarily manipulating and transferring genes, and does not realize it has created monsters. It is a Frankenstein science in exactly the way Mary Shelley's genius portrayed it. A cloned human embryo has even been created by transferring the human genetic material into a

cow's egg. Thankfully, they've destroyed it at day 14, the current legal limit. The original Dr. Frankenstein, at least, did not do it for money, while the Frankenstein science we have now is driven and blinded by profit.

Genetic engineering is a new departure from conventional techniques and introduces new hazards. Eminent UK scientist Arpad Pusztai was recently victimised for calling attention to the research findings of his group, which suggest that the GM potatoes they were testing are toxic and that the toxicities are in the genetic engineering process. Pusztai's findings are not the first to indicate that the hazards may be *inherent* to the technology. A large literature already exists, much of it described in my book, *Genetic Engineering Dream or Nightmare*. But the evidence has been ignored, or dismissed by the protagonists.

Many ecological and health impacts are well-known. GM crops have created herbicide-tolerant weeds and insecticide-resistant pests. The broad-spectrum herbicides used with the herbicide-tolerant GM crops not only decimate wild species indiscriminately, but are toxic to animals. Glufosinate causes birth defects in mammals, while glyphosate is now linked to non-Hodgkin's lymphoma. GM crops with bt-toxins kill beneficial insects such as bees and lacewings, and scientists in Cornell University have recently shown that pollen from bt-maize is lethal to monarch butterflies. You may not be aware, however, of the hazards inherent to the technology.

Genetic engineering introduces new genes and combinations of genes into crops whose ecological and health impacts have never been tested. Many of these genes are from viruses and bacteria that cause diseases, including antibiotic resistance genes that can compromise treatment for infectious diseases. Furthermore, the methods used to introduce foreign genes are uncontrollable. They give rise to random, unpredictable effects including new toxins and allergens.

Most dangerous of all, the foreign genes introduced can spread, not just by cross-pollinating related species, but to unrelated species by infection. This is called horizontal gene transfer, in which the genetic material itself is taken up. It has the potential to create new viruses and bacteria that cause diseases and spread antibiotic and drug resistance genes. The pioneers of genetic engineering called for a moratorium in the 1970s precisely because they were worried about this possibility. Unfortunately, commercial pressures cut the moratorium short. Since then, drug and antibiotic resistant infectious diseases have come back with a vengeance. New viruses appear at alarming frequencies, while dangerous bacteria are becoming resistant to all antibiotics and hence untreatable. What we now know that they didn't in the 1970s is that DNA itself is infectious, and can remain indefinitely long after the organisms have died. Genetically modified DNA can spread to organisms in all environments, including bacteria in the mouth, the gut and the respiratory tract of mammals. It can spread in pollen and dust.

Why is genetically modified DNA any more likely to spread than non-modified DNA? There are several reasons, the chief of which is that because genetically modified DNA has been designed to invade and jump into genomes, it may be more likely to jump again into other genomes. This involves an increased tendency of genetically modified DNA to break and join up with other DNA.

Indeed, foreign DNA jumping into the genomes of cells can itself give rise to many harmful effects including cancer. In its interim report published in May this year, the British Medical Association called for an indefinite moratorium on the release of GM crops pending further studies on new allergies, on the spread of antibiotic resistances and on the effects of genetically modified DNA. These concerns are shared by more than 100 scientists from 23 countries, including 37 from the US, who have signed a World Scientists' Statement calling for a 5 year global moratorium and a ban on patents of life-forms. It was launched this February in Cartagena, Columbia, during the United Nations Conference on the international Biosafety Protocol.

The biotech industry is being driven by the erroneous, outmoded belief that genes are the most important, constant determinants of organisms, so that by manipulating and transferring genes, new life-forms could be created to satisfy all our needs, and that by eliminating or replacing bad genes, we can get rid of all diseases. Instead, scientific findings for the past twenty years are demonstrating that the genetic material is fluid and dynamic, and can itself change in response to the ecological environment. Indeed, genes and genomes need a stable, balanced ecosystem to remain stable. Sustainable, organic agriculture is predicated on such balanced ecosystems. The conditions for genetic health, similarly, are no different from those for physiological health: unpolluted environment; wholesome organic foods free from agrochemicals; clean and socially satisfying living conditions. Those are the *real* choices for civil society.

It is symbolic that we have gathered in Washington. We are once again fighting for independence, this time from the transnational feudal lords. When we win, and I am confident we will, it will be the triumph of democracy over feudalism, of reason over stupidity, of love and compassion over exploitation, of life over death. It will be the end of the brave new world of bad science and big business. It will be the triumph of sustainable, responsible science and industry working together for the good of all.

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