

Introduction to Public Lecture by Dr. L. La Reesa Wolfenbarger
Delivered at Oregon State University on November 29th, 2005
“Environmental impacts and social responses to genetically engineered crops”
Introduction by Professor S.H. Strauss, Oregon State University

Good evening. Please turn the ringers on your cell phones and other electronic devices off.

My name is Steve Strauss, I am a Professor in the Department of Forest Science and the Genetics Program at OSU, and Director of the OSU Program in Biotechnology Outreach. Along with Kirsten Carroll, Executive Director of our Outreach Program, it is our pleasure to introduce the third in a series of lectures called “Food for Thought.” The series explores the scientific and social responses to the new agricultural technologies variously called genetic engineering or genetic modification, frequently abbreviated as GE, GM, or GMO. The goal of this series is to help educate and promote dialogue about what the science and technology is about; what it has done, or could do, for agricultural sustainability and human health; and how societies are responding to them and why. In short, to explore their benefits and risks, including the risks of choosing to live without them. The lecture series is supported by the Wait and Lois Rising Lectureship Fund, the Center for Genome Research and Biocomputing, the Linus Pauling Institute, and the Colleges of Agricultural Sciences and Forestry.

Today’s public lecture will be followed by a reception with refreshments for those interested in meeting Dr. Wolfenbarger, or discussing the issues she raises further.

In the first lecture in this series Dr. Potrykus made a passionate case for a humanitarian use of GE crops—that of producing Vitamin A fortified rice to reduce the millions of deaths and cases of blindness in the developing world. In the second lecture, Dr. Fedoroff compared GE to the history of domestication of crops, and debunked what she saw as the many urban myths of harm to food quality and environment from GE crops. In today’s lecture, we will take a closer look at the environmental issues surrounding GE crops, with the guidance of an ecologist whose career has intersected the GE debate head-on.

Dr. Wolfenbarger is rare among scientists engaged in the GE debates in her ability to stand back and look at all the issues with balance and composure. To know how agriculture is faring with a new, widely used, and extremely diverse technology like GE is very difficult—especially when considering all the dimensions of ecological function, most of which are highly site- and time-specific. These dimensions span soils, water, biological diversity, toxicology, atmosphere, gene dispersal, and crop health. Improvements in one aspect of these complex systems often come at the expense of others, and are extremely difficult to measure accurately. As Dr. Wolfenbarger has written in a commentary in 2004:

“A fundamental and unresolved issue is which data can be used most effectively to assess... [ecological] impacts [of GE crops]. This is a particularly thorny question for [GE and] all forms of biological introductions because of the high degree of variation present in ecological systems. An introduced organism functions within a complex existing ecosystem, with numerous avenues for interaction with adjacent communities.”

The title of Dr. Wolfenbarger’s lecture “*Environmental impacts and social responses to genetically engineered crops*,” shows that she understands that assessing the *significance* of ecological effects is not just a task for biological scientists. All forms of agriculture, from the many forms of conventional through organic systems, are highly disturbing to the natural environment. Societies accept some forms

of perturbation much more than others, accepts them much more in some places than in others, can choose to mitigate undesired effects both on-site and off-site, and their tolerance varies widely between cultures and degrees of food and economic security.

Dr. Wolfenbarger grew up in a highly agricultural part of central California, and developed her love for the environment while backpacking in the Sierra Nevada Mountains. She obtained a BS in biology from UCLA in 1987, with her choice of major based on a love of science and ecology. She wrote "...[I] liked the puzzle of figuring things out and why things worked, and I like knowing things (a good quality in a know-it-all)." She obtained her PhD from Cornell University in 1996 studying birds. For her PhD thesis she studied the ecological significance of the red coloration of Northern Cardinals—strikingly beautiful birds of the eastern United States. In 1999 she was awarded a AAAS Science and Policy Fellowship to work at the Environmental Protection Agency in their National Center for Environmental Assessment in Washington, DC. While there she published a highly influential review in Science magazine entitled "*The ecological risks and benefits of genetically engineered plants.*" She moved to the University of Nebraska in Omaha in 2001 and began studies of the effects of GE and other agricultural practices on ecological communities. Among her current research grants is one from USDA entitled "large scale ecological effects of herbicide tolerant crops on bird communities and their reproduction."

Dr. Wolfenbarger has led or been invited to serve on science committees evaluating the ecological impacts of GE crops at the US Department of Agriculture, the Environmental Protection Agency, and under the purview of the North American Free Trade Agreement. Two of the topics she has addressed are "...strategic monitoring for ecological impacts..[of GE crops]" and "...assessment of effects on natural ecosystems... [from transgenic maize in Mexico]." She was part of a team of scientists that issued a report earlier this year entitled "GE organisms and the environment" that was called for and endorsed by the Ecological Society of America or ESA—the largest and most prominent organization of ecologists in the USA. The report, while urging caution against adoption of novel types of GE crops without careful ecological study, also confirmed the findings of several earlier ESA and National Academy of Sciences reports on GE organisms in concluding that "...risk evaluation ... should focus on the phenotype or product rather than the process of genetic engineering." It also stated that GE organisms "...have the potential to play a positive role in sustainable agriculture, forestry, aquaculture, bioremediation, and environmental management, both in developed and developing countries." These findings often surprise people, many of whom assume that because of the stance of some environmental NGO's against all GE crops, that ecologists are also against them. This is obviously far from the truth. However, there is a great deal of controversy among ecological scientists about which kinds GE crops are useful and where, and how well they should be studied prior to and during commercial use. It is these difficult questions that Dr. Wolfenbarger will discuss this evening.

Please help me in welcoming her.