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To: ATR-Agricultural Workshops <agriculturalworkshops@usdoj.gov>
Subject: "The Genetic Engineering of Food and the Failure of Science"

"The Genetic Engineering of Food and the Failure of Science" □ Agro-ecologist Don Lotter published a paper titled "The Genetic Engineering of Food and the Failure of Science" in the 2009 edition of the peer-reviewed International Journal of Sociology of Agriculture and Food.

The paper makes a damning case against genetically modified foods, saying the technology is based on obsolete science, that biotechnology companies such as Monsanto have too much influence on government regulators and "public" universities, and that university scientists are ignoring the health and environmental risks of GM crops. Lotter calls the introduction of GM foods the "largest diet experiment in history."

Lotter has a Ph.D. in agro-ecology from the University of California, Davis, and a master of professional studies in international agricultural and rural development from Cornell University. He has taught environmental science, soil science, plant science, entomology, and vegetable crop production for Santa Monica College, Imperial Valley College, and UC-Davis.

Lotter does not have a tenured position and is currently working on an agricultural project in Tanzania. He half-jokingly describes his paper as "career destroying" because he says it will be difficult to find a position at a US university due to the general recognition at most US universities that GM foods are safe and will help "feed the world."

If you thought publishing the paper would jeopardize your prospects for finding a position, why did you write the paper?

DL: I'm proud of the paper. This topic should be taught at universities. There is an enormous gap in public knowledge about this issue.

The science of genetic engineering is based on the one gene-one protein doctrine. Please describe this and why you think it is flawed.

DL: When they discovered the technology there was a simplified view that genes were in charge of the production of proteins. It is the entire basis for going forward with genetic engineering technology.

Then the Human Genome Project showed that humans have fewer genes than simple organisms, but we also have one to two million proteins. This discovery put an end to the one gene-one protein doctrine.

But by then there had been a massive investment in transgenics. The industry moved ahead with all their PR of "feeding the world" without any scientific basis for their technology. The doctrine has crumbled away, yet the industry has gone on.

In your paper you say that the process of genetically engineering foods is also deeply flawed. Can you give some examples of why that is the case?

DL: The promoter gene used in genetically engineered crops, the cauliflower mosaic virus, is a

powerful promoter of inter-species gene exchange. Scientists thought it would be denatured in our digestive system, but it's not. It has been shown to promote the transfer of transgenes from GM foods to the bacteria within our digestive system, which are responsible for 80% of our immune system function; they are enormously important. This is a huge flaw, but not even the biggest in crop transgenics.

The process of splicing genes into plant genomes, transgenics, causes serious genetic damage—mutations, multiple copies of the transgenic DNA, gene silencing. The ramifications of this damage, incredibly, have never been elucidated or even explored for that matter.

Do you think the increase in food allergies we are seeing may be due to GM foods?

DL: Yes, there is evidence pointing to it. The industry is powerful enough to stop any labeling legislation. Without labeling they can't track these problems. We know that after the introduction of GM soy in Britain, there was an increase of soy allergies there.

In your paper, you write that the lack of oversight of GM foods has been a major failure of US science leadership. What makes you believe this?

DL: In the early 1980s, the biotech companies were successful in getting to oversee the regulation of GM foods. The scientific community should have stepped in, and said this is a radical technology, but it didn't.

There has also been a restructuring of the relationship between industry and universities. The Bayh-Dole Act (which gives universities intellectual property control of their inventions) made universities more dependent on industry.

Universities saw transgenics as a big money source, and scientists who objected were harassed or pushed out.

Do you think any US university would fund studies on GM food safety?

DL: No, they are not doing that. Anyone who tries to conduct research looking at GM food safety is given trouble. □ Universities should have a mandate to find problems with GM foods.

We need federal money to look at non-proprietary solutions, such as organic farming systems, to the world's problems, and we should see whether proprietary approaches (i.e. GM foods) cause problems.

Unfortunately, non-proprietary solutions don't get funding.

We can show that organic farming systems promote drought resistance; the Rodale Institute did this research. But if a GM crop had been found to resist drought, there would have been major news headlines saying that it will save the world.

Is the safety of GM food considered a given at US universities?

DL: Absolutely. The debate is not there. US scientists have abdicated their responsibility on this issue. They know problems exist but they don't want to talk about them.

Most scientists say we need GM foods to feed the world. Some social scientists are saying there are problems (with GM foods).

I think undergraduate groups will bring the debate over GM foods to universities.

What type of agricultural approaches do you think will solve the world's food production challenges?

DL: The IAASTD (International Assessment of Agricultural Science and Technology for Development) report said that we can produce food using agro-ecological methods and successful green revolution methods. The report didn't include transgenics.

The report was signed by 60 countries, but the US didn't sign it.