

Former EPA Scientist: Biotech Companies Encouraging Pesticide Treadmill

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Global Research, June 02, 2015

[The Organic and Non-GMO Report](#) 28 May 2014

Theme: [Biotechnology and GMO, Environment](#)

Dr. Ramon Seidler (left), a retired senior scientist from the US Environmental Protection Agency, has become a leading spokesperson against genetically modified foods and the increasing use of pesticides with GM crops. He actively supported Oregon's GMO labeling initiative, Measure 92, which was narrowly defeated last fall.

Dr. Seidler's criticism of GMOs is noteworthy because during his career at the EPA he studied the impacts of genetically modified organisms on the environment. He and his fellow researchers developed methods to evaluate and predict the survival, multiplication, gene exchange, effects, and dispersal of GMOs. He published papers on these topics.

Prior to his work at the EPA, Dr. Seidler was a professor of microbiology at Oregon State University for 16 years.

Dr. Seidler was elected as Fellow in the American Academy for Microbiology. He was listed by the International Biographical Centre of Cambridge, England as one of the 2,000 Outstanding World Scientists of the 20th Century. He twice received the EPA Bronze Medal for research service to the agency and has authored or co-authored more than 150 scientific peer reviewed publications.

Tell me about your research on genetically engineered crops when you were at the EPA?

Dr. Ramon Seidler: We learned how to conduct experiments in contained indoor environments. In these self-contained units that mimicked the environment, we studied the fate, survival, and gene transfer capabilities of GMOs. Later we were the first team in the world to conduct an outdoor experiment involving different types of genetically engineered alfalfa inoculated with GE beneficial root bacteria. We discovered that the GE bacteria survived for years in the soil, even after the removal of the alfalfa plants.

We also studied the persistence of transgenic DNA and Bt toxin products in agricultural ecosystems.

What are some of the problems you see with genetically engineered crops?

Dr. Seidler: From the risk assessment, economic, and legal perspectives there are many issues. There is a mixture of unfilled promises, concerns over litigation resulting from cross pollination and seed comingling events, and a disappointment that crop management practices have had significant negative impacts upon environmental biosafety. All of these side effects are happening despite no yield or production advantages of GE crops over

traditional crops. There are also major concerns over whether the increased use of pesticides on our food crops have impacts upon the human population.

Over 90 percent of Americans wish we had labels on our foods to indicate when GE products are present. One-third of the world has this choice because their foods are labeled, but Americans are denied that option.

Very little sound research has been conducted by independent scientists in American universities. This is because industry essentially restricted such research by requiring professors sign an agreement prior to the research that any published information first be sent to the biotechnology seed industry for review. This de facto censorship discourages scientists and their students from becoming involved in conducting years of research that may never reach the scientific peer reviewed literature.

Other countries are rejecting US food products because of genetic contamination. The 2013 discovery of genetically engineered wheat growing illegally in Oregon prevented farmers in our county and elsewhere from exporting their non-GMO wheat until the situation was resolved.

Genetic engineering proponents say that these crops have reduced pesticide use. What is your reaction to that?

Dr. Seidler: The biotechnology industry has repeatedly told us that pesticide use has declined since the introduction of genetically engineered crops. Unfortunately this is not the case. Initially, insecticide use declined due to the effectiveness of Bt toxin in controlling pest insects. However, as time went on glyphosate use increased some 13-fold to control weeds and other non-genetically engineered synthetic chemicals were introduced to control insects as the Bt toxin became ineffective.

Glyphosate has been extensively applied to hundreds of millions of acres of genetically engineered crops, and the residues are in our air, water, and human bodies.

Now virtually all of genetically engineered seeds are coated with insecticides and fungicides and these chemicals have increased some 10-fold in the last 10 years.

When seed coated pesticides are added to those pesticides that are injected into the soil at seed planting, pesticide use climbed back to where it was approximately 10-12 years ago.

What is the pesticide treadmill?

Dr. Seidler: The massive continuing use of genetically engineered Bt toxin and glyphosate-based weed killer on crops planted on hundreds of millions of acres for nearly 20 years has selected for insect and weed resistances. These resistances were anticipated by many scientists, including by Dr. Rachel Carson, author of *Silent Spring*, a landmark book published in 1962. The chemical industry's answer to these resistance problems is to genetically engineer crops to be resistant to other chemicals, leading to the pesticide treadmill. One chemical leads to the next chemical, and the next, etc. The current result of this strategy is to use paired combinations of herbicides on our food crops, including 2,4-D, Dicamba, Glufosinate, Isoxaflutole plus glyphosate-based chemicals.

Some people have expressed concerns about possible synergistic effects from the use of

two herbicides together, that they might be stronger than each individually. I believe that regulatory scientists did not require industry to evaluate the combined effects of paired herbicides. It would be appropriate to see toxicology risk assessments conducted with chemical products that will be sprayed onto our food crops with the actual commercial mixture being tested, not just tests on the so-called “active” ingredients.

My first concern with 2,4-D is whether it is truly free from a horrifically toxic class of chemicals called dioxins. Industry has stated the 2,4-D that will be used is free from dioxin contamination. It would have been reassuring if the regulators had asked industry to conduct periodic chemical analyses with batches of 2,4-D to document whether dioxins are present.

What can be done to address this chemical onslaught?

Dr. Seidler: A paradigm shift is needed in the large-scale crop production methods used in industrialized nations. As Rachel Carson said over 50 years ago, scientists need to conduct thorough ecologically based evaluations to determine the consequences of using new chemicals in the environment. There needs to be a thorough, transparent investigation to determine how long a pesticide persists in nature and what the ecological and toxicological effects are from its use.

The pesticide treadmill is an incomplete, ineffective option that will lead to a temporary solution but continuing need for new pest treatment strategies and thus new chemical sales by the biotechnology industry. The omission of synthetic chemicals and the deletion of a fossil fuel-based agricultural system are necessary parts of the paradigm shift, and this means eliminating the current genetically engineered crop-based form of agriculture.

What would be your recommendations for creating a healthy sustainable food system?

Dr. Seidler: It is understood widely that a petroleum and chemical-based, corporate agriculture involving GE crops is not a solution for promoting soil health and carbon sequestration to reverse global warming and for promoting sustainable food production. Developing new and applying proven methods that maintain soil sustainability and sequester carbon into soil to reverse global warming will require concerted efforts by world scientists.

However, we already have an excellent store of information and practice that allows us to immediately restore billions of degraded acres worldwide without relying on “cheap,” and destructive petrochemical-based solutions. The methods currently available today are referred to as agroecology, restoration ecology, and organic farming.

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