

Anti-transgenic irrationality

Genetic engineering is more precise than conventional breeding

By Thomas R. DeGregori

Transgenic (aka genetically modified) foodstuffs have become the latest villain of choice for those who believe that modern science and technology are killing us. If science and technology are killing us, why are we living longer, healthier lives?

Most everything that we eat has been genetically modified. Somehow, genetic modification is uniquely dangerous and refers exclusively to transgenetics, which modifies the genome less than any other form of plant breeding.

Every form of plant breeding has unknown outcomes.

Conventional breeding of wheat will result in a plant with about 3,000 alien genes. The breeder does not know where the vast majority of "alien" genes are or what they might express. This has been done safely for thousands of years.

Sometimes the products of conventional breeding have to be withdrawn because of excessive production of toxins. Recent examples include potatoes, celery and squash.

A year ago in New Zealand, there was an outbreak of food poisoning from a "killer zucchini" that hospitalized a number of people. Environmentalists jumped all over the story until it was determined that the culprit was "organic" zucchini. Plants are chemical factories that produce a multitude of toxins that protect them. An outbreak of aphid infestation had minimal impact on conventionally grown zucchini. The more vulnerable "organic" zucchini was genetically inferior because of inbreeding. These zucchini had expressed dangerously high levels of the toxin cucurbitacin. Had this been a transgenic plant, we would be

hearing about it ad nauseam, but being that it was "organic," it was quickly consigned to an Orwellian memory hole.

For the last 70 years, we have been engaged in forms of mutation breeding either by using toxic, carcinogenic chemicals such as ethyl methane sulphonate or nitrogen mustard, or by radiation. This is truly "mutant" grub. Colchicine allowed for a variety of species crosses to add in resistant genes to grains to reduce the need for pesticides.

Given our phobias about "chemicals" (with only those produced by humans being harmful) and radiation, where are those

concerned about their use in plant breeding? The best estimates are that about 70 percent of fruit and vegetable produce is the product of some form of mutation breeding. The 70 percent figure would be an understatement for "organic" produce since the desire

to use less synthetic pesticide requires the grower to use varieties that produce more of their own "natural" toxins. Check the website of the Louis Bolk Institute in Holland. They are advocates of "biodynamic" agriculture and readily admit the near impossibility of obtaining most produce in forms that they find in accord with "holistic principles of nature."

To mutation breeding, add in techniques such as protoplast cell fusion, embryo rescue, meristem tip culture and other forms of tissue culture or somoclonal variation. Many of our food crops are a product of more than one of these heroic techniques that substantially modify the genome far more than transgenics. Any reading of the peer-reviewed literature on the subject makes that clear.

"Most everything that we eat has been genetically modified."



Horizons in Livestock Sciences Redesigning Animal Agriculture

Thomas DeGregori is Professor of Economics, University of Houston and Board of Directors of the American Council on Science and Health has extensive overseas experience as a development economist including work as a policy advisor to donor organizations and developing countries.

He is widely published - his most recent books include:

Origins of the Organic Agriculture Debate; The Environment, Our Natural Resources, and Modern Technology and Agriculture and Modern Technology: A Defense (Blackwell Publisher for all three) and Bountiful Harvest: Technology, Food Safety, And The Environment (Cato Institute).

Professor DeGregori's presentation to the Horizons conference is entitled 'The All-Natural Bioengineered Future of Humans as Omnivores: The Past as Prologue'



Dr Thomas R. DeGregori

Even stores that fraudulently claim to be free of genetically-modified produce will have many items produced using transgenic yeasts, enzymes, emulsifiers, micro-organisms or transgenic soybeans. The only way that we can be sure about what we are eating is to be given a CD-ROM with each purchase that gives the complete provenance of the food crop as well as the hundreds, if not thousands, of toxins that its genome is capable of expressing and its likely invisible microbial infestation. And for any grain product, check your food safety authority for

"We can accept as fact many of the concerns raised about transgenic food crops. But these concerns are even truer about everything else that we eat, including "organic" produce."

the tolerance for aphid infestation, and the presence of rodent hairs and feces - that is, if you really want to know.

We can accept as fact many of the concerns raised about transgenic food crops. But these concerns are even truer about everything else that we eat, including "organic" produce. There is a litany of all the evils that have resulted from transgenic products but none of them have withstood scientific scrutiny and peer-reviewed publication. Next time you are assaulted with horror stories about transgenic products, ask to see the peer-reviewed literature and not the usual vanity press publications.

Most critics are silent on the many benefits of ribosomal DNA.



"Designer produce may be safer than food produced by conventional breeding techniques"

Starting with insulin in 1982, an increasing number of our most important pharmaceuticals are either the product of transgenics or developed using transgenic mice, or both. BT maize - maize designed to resist insects - produces a measurably safer crop that is less infested with fusarium ear rot and deadly mycotoxins (called fumonisins) that the fungus produces.

The yield gains from reduced crop loss means that less land has to be brought under cultivation leaving more land for wildlife and biodiversity. This follows on the allegedly "failed" Green Revolution which allowed the world to accommodate a doubling of world population from 1960 to 2000 by increasing food production 2.7 times with only a seven percent increase in land under cultivation.

Despite its critics, transgenics clearly represents progress in agriculture.

- Article first published in The Daily Cougar Online, the University of Houston Volume 69, Issue 141, Monday, May 3, 2004

Dr DeGregori will be attending the Horizons in Livestock Sciences conference on the Gold Coast, 2-5 october 2005.

For more information contact Margaret Puls, tel +617 3214 2394, email Margaret.Puls@csiro.au