

Working for a **GE-free** future

We can keep Australia GE-free

Most Australians, including farmers, support GE-free policies to protect public health, the environment and our markets. Surveys show majority support for bans on genetically engineered (GE) crops, and full labelling of all foods made using GE processes and products.

But governments and agri-business giants continually push for GE food crops to be grown in Australia.

An AC Nielson poll confirms that most of us, given the choice, would not eat GE foods. Nor would shoppers in our overseas markets who pay premium prices for our GE-free foods. Many markets for Australian produce, such as Europe and Japan, favour imports from us because we are GE-free. We should keep

this competitive advantage over GE growing countries.

Many independent scientists challenge GE industry claims that GE foods are safe, as the scientific evidence of harm to experimental animals mounts. None of the promised benefits — healthier, more nutritious or longer shelf life foods, and drought-resistant or salt-tolerant plants — have come true. Many food processing companies now choose to be GE-free because their customers say



GE foods are not safe or needed. For example, Starbucks has dropped dairy products from GE growth hormone-treated animals. US Safeway has also said no to GE milk, in response to customer pressure. Many processors are also labelling their products GE-free or GMO-free, and all certified organic foods are guaranteed GE-free. Buying these products sends a clear message that GE foods are not acceptable.

We can all join with the many chefs, farmers, food scientists, public health professionals, nutritionists and processors to send the GE-free message to governments and industry.

▶ Voice your opposition to GE foods and crops.

GE bans at risk

All canola-growing states — New South Wales, ACT, Victoria, Tasmania, South Australia and Western Australia — banned commercial GE canola crops in 2003.

The federal regulator (OGTR) had issued unrestricted licenses to grow GE canola, but public protest and food industry concern over lost GE-free markets forced the

states to use their reserve powers and declare their states GE-free.

As governments review their bans in 2007 and 2008, active support by rural and



urban citizens is needed to have the GE canola bans extended. Most shoppers support canola bans. So do most farmers, food processors and grain traders, such as Murray Goulburn, AWB and ABB, who want to protect Australia's GE-free market advantage.

▶ Please support extensions of the state GE canola bans.

Some genetically engineered foods are not safe

Food Standards Australia NZ (FSANZ), our food regulator, should require independent scientific experiments to ensure the safety of GE foods.

"FSANZ does none of its own safety testing, instead relying on company data," says Australian epidemiologist Dr Judy Carman. "But even within these experiments, which are limited in their ability to pick up health problems, some adverse effects were found. There is an urgent need for comprehensive safety testing by independent researchers."

The evidence of harm from GE foods is mounting:

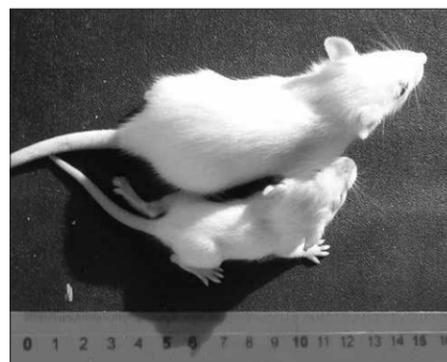
- In 1989 over 5,000 people, mostly in the USA, were stricken by a new disease — Eosinophilia-Myalgia Syndrome (EMS). Around 1,500 people were permanently disabled and

35 died immediately. They were injured by the health supplement L-tryptophan, made by Japanese manufacturer Showa Denko using GE microbes. Charles Yanofsky, Professor of Biology at Stanford University, found the GE bacteria had caused "the higher levels of toxic substances" responsible for EMS and it was not filtered out. Three other independent reports agreed and the company paid \$1.2 billion to the victims.

- In Australia, CSIRO made GE field peas using a gene from beans to make the peas weevil resistant. Australian National University feeding experiments

found that mice, fed cooked or uncooked peas, all got antibodies from a serious allergic reaction. (Journal of Agricultural and Food Chemistry).

- Dr Irina Ermakova fed soy to two groups of pregnant rats as part of their diet. One group were fed Monsanto's GE Roundup Ready soy and the other ate conventional soy. Pups from the rats fed Roundup Ready soy died at much higher rates and were stunted, compared to the control group. Yet FSANZ refuses to review Roundup Ready soy, approved for use in our food supply.



▶ These rats are the same age. The runt's mother ate GE soy.

diet. After a month, Pusztai's team found that rats fed the GE potatoes had damaged immune systems and organs; smaller, less-developed brains, livers and testicles; and they were more vulnerable to disease than the controls. Dr Pusztai reported: "From the evidence, it was clear... there was some effect from the process of genetic engineering itself that caused the damaged organs and immune dysfunction of the adolescent rats."

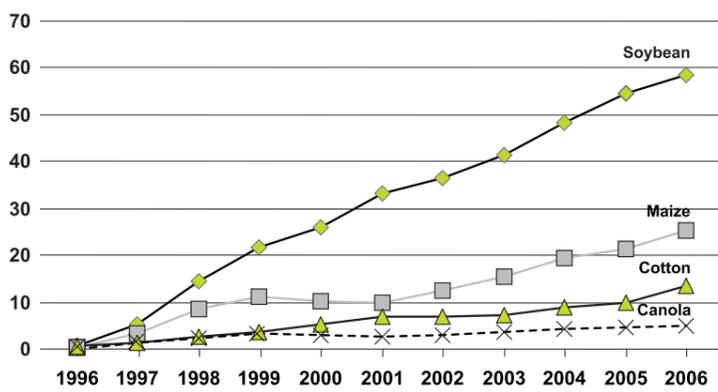
▶ Over 90% of Australians want all foods made using GE to be labelled but most foods are exempt. Please stand up for everyone's right to choose by supporting Gene Ethics' GE-free campaign.

- World-renowned toxicologist Dr Arpad Pusztai fed GE potatoes to one group of rats as part of their normal diet, while the control group ate conventional potato in their normal

GE crops fail to deliver on promises

ISAAA's annual review of GE crops shows they stalled in 1996, the first year they were grown. The four broadacre commercial crops — soy, corn, cotton and canola — had just two commercial GE traits — herbicide tolerance (so they could be oversprayed with weed killer) and Bt (to make their own caterpillar toxins). Not one new commercial crop or trait has been released since 1996.

■ Global area of biotech crops, 1996 to 2006: by crop (million hectares)



Source: C. James, ISAAA (International Service for the Acquisition of Agrobiotechnology Applications), 2006

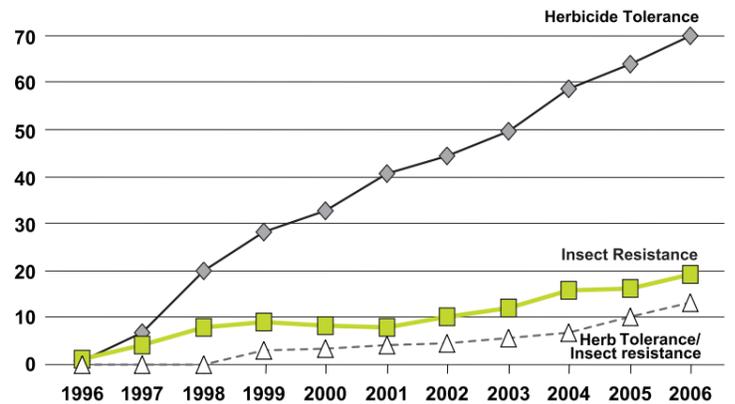
The GE industry wanted to commercialise GE wheat, potatoes and tomatoes, but shoppers, farmers and the food industry rejected them. Industry also makes empty promises about other GE crops but none are near commercial release.

GE crops are not a global industry. In 2006, 99% of GE crops were grown in only eight countries — USA 53.5%; Argentina 17.6%; Brazil 11.3%; Canada 6%; India 3.7%; China 3.4%; Paraguay 2%; and South Africa 1.4%.

The ISAAA's industry-backed report emphasises that 10.3 million of the world's 1.3 billion farmers grew GE crops in 2006 — just 0.7% of all farmers. But 600,000 farmers, on industrial farms in North and South America, grew 85% of all GE crops. Despite ISAAA claims, small-scale third world farmers cannot benefit from crops developed for big mechanised farming.

If Australian governments

■ Global area of biotech crops, 1996 to 2006: by trait (million hectares)



Source: C. James, ISAAA, 2006

allow commercial GE canola here, our farmers will miss out too. GE canola cannot be segregated from GE-free or kept out of related weeds that will be more expensive and troublesome to manage when they also become herbicide tolerant. Failed GE technology has

been overtaken by smarter, more precise and successful genetic science — genomics and proteomics — in tandem with traditional breeding.

Let's move on.

Support Australian farmers. Most want to stay GE-free.

“Farmers are being misled by GE industry spin.” — Julie Newman, WA grain grower

Genetic Engineering: failed technology

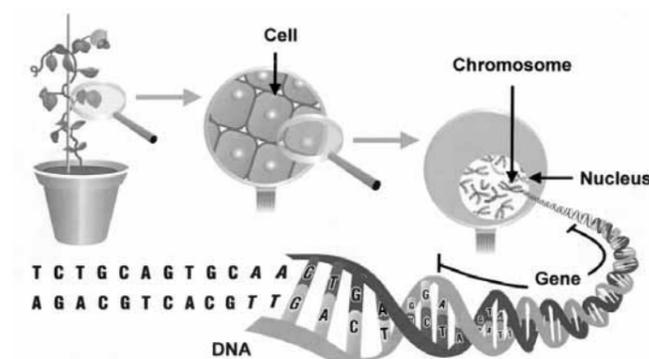
A gene is a string of four-chemical codes in DNA, coiled inside the nucleus of each cell in all living organisms. These coded sequences determine the form and function of the cell and the whole organism — animals, plants, microbes and humans.

Gene technologies are a set of physical and chemical tools used to cut and paste sections of DNA from one living organism to another, often unrelated, one. For instance, an experiment transferred an anti-freeze gene from Arctic flounder into the DNA of tomatoes to try and enable the plants to grow in cold weather.

Gene transfer between species cannot happen in nature or by using traditional breeding. Fish genes could only get into fruit by using genetic engineering.

The tools for GE are still crude and inexact, so the results are hit-and-miss. For example, scientists who fired the flounder gene into the genetic system of the tomato cells could not pre-

■ Genes are made of DNA



Courtesy: CSIRO Plant Industry

dict where the introduced gene would land, or its effects. Genetic systems determine the unique makeup of each life-form, so a foreign gene has a cascade effect. Scientists first thought that just one gene coded for each genetic trait, so cutting and pasting genes would work. But it is now known that many biological processes involve complex interactions between several genes. Single gene traits such as herbicide tolerance or cystic fibrosis are exceptions, so GE occasionally works but is risky.

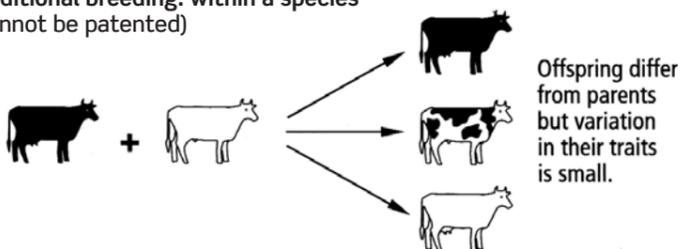
To downplay the risks, GE supporters call the process genetic modification and claim the technology is just an extension of traditional breeding.

With gene technology, companies can also pirate the wonderful array of foods developed by our forebears. For thousands of years farmers and seed-savers kept the best seeds, animals and microbes (for beer, bread and yoghurt), year after year. These were owned by all of humanity and were freely exchanged for the benefit of everyone. But now technologists add genes to these highly developed and publicly owned life-forms. They claim to have made an invention, are issued a patent, and gain private monopoly ownership and control of all the previous development work. This is biopiracy.

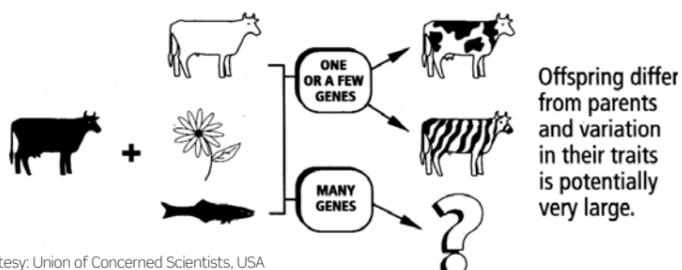
Support Gene Ethics' work to keep Australia GE-free.

■ Genetic engineering is a radically different technology

Traditional breeding: within a species (cannot be patented)



Genetic engineering: between species (genes, processes and products are patented)



Courtesy: Union of Concerned Scientists, USA

DUDS

The Flavr Savr GE tomato — claimed to taste better and last longer. But these false-fresh tomatoes never ripened, split their skins, were flavourless and cost a lot more. The product and the company failed.

Publicly-funded CSIRO promised non-browning fruit and vegies but turning off the 'browning' gene made the GE plants prone to virus attack. A lot of our money down the drain!

CSIRO also stopped its GE weevil-resistant field pea research after stock animals lost weight and lab rats had serious health problems.

A brazil nut gene was experimentally cut and pasted into soybeans, to make more nutritious chicken feed but, unexpectedly, the GE soy triggered allergies in susceptible people.

Help Gene Ethics reclaim our food supply

Agro-chemical companies control much of the world's commercial seed supply, both conventional and GE. In 2005, Monsanto bought Seminis, the world's largest fruit and vegetable seed company. In 2006 it also acquired Delta and Pine Land, the company developing Terminator technology.

"GE companies also try to further extend their control of the world's seed supply by limiting the availability of non-GE seeds," says Dr Scrinis. Farmers are increasingly at the mercy of

companies. For example, Monsanto's Roundup Ready herbicide is approved for use on GE herbicide tolerant canola and is sold as a GE seed-chemical package, so the "companies

are using genetic technologies to engineer their own interests directly into the genetic structure of plants and animals," says Dr Scrinis. Many agro-chemical companies have been convicted of social and environmental crimes. For instance, Monsanto was fined in France for claiming its Roundup Ready herbicide is environmentally safe. And Bayer was fined by the Environment Department of Norway's capital city, Oslo, for

contaminating the Oslo fjord with persistent toxic PCB chemicals.

The law says our Office of Gene Technology Regulator (OGTR) must assess the suitability of applicants to hold GE licences. But despite their many convictions, federal regulators welcome Bayer, Monsanto and their GE crops into Australia.

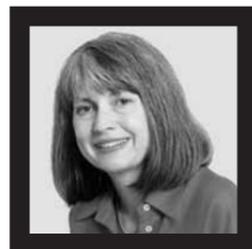
✎ Have your say on GE crop releases in Australia by visiting www.ogtr.gov.au

"Corporate ownership and control of the entire food chain is one of the driving forces behind the introduction of GE crops and animals." — Dr Gyorgy Scrinis, RMIT University's Globalism Institute



"The tools of genetic engineering are designed to steal nature's harvest by destroying biodiversity, increasing the use of herbicides and pesticides, and spreading the risk of irreversible genetic pollution."

— Dr Vandana Shiva, Director, Research Foundation for Science, Technology and Natural Resource Policy, India.



"Claims that GE foods are essential to feed the increasing world population are absurd."

— Dr Rosemary Stanton, OAM, PhD



"Genetic engineering, at least in its current form, can never succeed. It is based on misconceptions that organisms are machines, and on a denial of the complexity and flexibility of the organic whole."

—Dr Mae Wan-Ho, Institute of Science in Society

CASE STUDY: TERMINATOR TECHNOLOGY

SEED is the basis of life on Earth and most plants and animals need viable seed to reproduce. A new technology called Terminator is being developed to prevent this natural process, so the owners of Terminator can gain control of the world's seed supply and agriculture.

Terminator technology, known officially as GURTS (Genetic Use Restriction Technologies), sterilises a seed as it develops in a plant. This means farmers can't store or replant seed from season to

season as many now do. Instead, they must buy new seed and pay a technology fee.

Terminator technologies are designed "to protect US technology and seed patents," says Melvin Oliver of the US Department of Agriculture, which first had the Terminator idea. Delta & Pine Land (now owned by Monsanto) developed the idea that it called a "Technology Protection System". Bayer also has Terminator, its "new hybrid breeding system".

GURTs may also stop plants

fruiting unless a patented chemical is applied. Farmers would be sold a seed-chemical package.

If Terminator were commercialised, farmers would be prevented from using the ancient practices of harvesting, saving and replanting seed. Farmers rely on these processes to adapt their local varieties to unique environmental, soil and management conditions. As climate change globally this will become even more crucial.

As the plant's pollen remains fertile, Terminator

genes can be transferred to other plants. This would sterilise them, too, wreaking environmental havoc and threatening food security.

The United Nations has imposed an informal global ban on Terminator. But at the urging of Bayer, Monsanto and the US government, Australia is trying to undermine the ban.

✎ Please sign the Gene Ethics petition to ban Terminator. For copies of the petition, go to www.geneethics.org. See also www.banterminator.org

Broken promises

PROMISE GE will feed the world.

REALITY Overall, GE crops are no more productive than conventional varieties, as a plant with a new trait needs extra energy to perform that task, lowering production. GE seeds are more expensive, reinforcing the debt and dependency of small family farmers. The world has enough food for everyone, but 850 million people are starving or malnourished now through war, poverty and bad governance. GE cannot solve these social problems. With oil running out, farming must become less energy and chemical intensive, and more sustainable for future generations.

PROMISE GE crops will boost the economy and increase profits.

REALITY "Australia should avoid the problems, disappointments and market losses that the US experienced with GE," says US agronomist Dr Charles Benbrook. The US and Canada lost big European and Asian markets for GE-free corn, canola and soy when

they began growing GE crops. The US lost \$12 billion when Europe refused its corn and Canada lost its European canola market to Australia. GE-free Australia still supplies that canola market and premiums were up to \$100/tonne during 2006.

PROMISE GE food is fully tested, assessed and safe.

REALITY Industry runs most trials of GE foods and crops, and independent trials are rare. The regulators accept company data and assume that all food is safe. But US Environmental Protection Agency (EPA) toxicologist Dr Suzanne Wuerthele warned: "This technology is being promoted, in the face of concerns by respectable scientists and in the face of data to the contrary, by the very agencies which are supposed to be protecting human health and the environment."

PROMISE Golden (Vitamin A fortified) Rice can prevent childhood blindness.

REALITY A balanced diet of green vegetables and other foods would provide enough

Vitamin A to keep kids healthy. Providing an affordable balanced diet for everyone in the world is the challenge. Nutritionist, Dr Rosemary Stanton, points out that a child would have to eat 54 cups of Golden Rice per day to have the claimed effect. Regular Vitamin A pills for every child in developing countries would also cost a lot less than Golden Rice, without the risks.

PROMISE GE crops lower pesticide and herbicide use.

REALITY Over 70% of all commercial GE crops are herbicide tolerant, so farmers can spray more often and at higher doses to kill weeds more efficiently. But repeated spraying of Roundup, for example, has resulted in widespread weed resistance. Weeds infest millions of hectares and cost Australian land managers up to \$6 billion to manage each year. Roundup tolerant ryegrass and other weeds are bumping up the cost. Up to four different herbicides are now needed for effective weed control.

PROMISE GE may produce more nutritious foods.



REALITY The nutritional value of GE foods is uncertain. Trying to genetically engineer foods that are more nutritious "avoids confronting the real problems," says nutritionist Dr Rosemary Stanton. "Vegetables and fruits have health benefits, but few people in developed countries eat enough of them. Genetically modifying another food to include nutrients already found in vegetables and fruits is a nonsense."

PROMISE Cooked GE foods are harmless.

REALITY The ANU trial of CSIRO GE field peas found that the cooked and uncooked peas both harmed the rats. In another study, seven people with colostomy bags each ate a burger and milkshake containing processed GE soy. The study found "a relatively large proportion of genetically modified DNA survived the passage through the small bowel," and there was evidence that the foreign genes transferred to intestinal microbes.

Scientists challenge Genetic Engineering



"Many scientifically valid concerns are raised by independent

scientists worldwide about the safety of these foods. GM foods were initially approved as safe as a result of a political directive which overrode the warnings of the US Food and Drug Administration's own experts."

— *Epidemiologist Dr Judy Carman, and medical practitioner Dr Kate Clinch-Jones*



"The number of scientists who are not convinced about the safety of

genetically engineered foods is substantial enough to prevent the existence of a general recognition of safety. I am not aware of any study in the peer-reviewed scientific literature that establishes the safety of even one specific genetically engineered food let alone the safety of these foods as a general class."

— *Geneticist and Emeritus Professor Richard Lacey, M.D., Ph.D.*



"Genes exist in networks, interactive networks which have a logic of their

own. And the fact that the industry folks don't deal with these networks is what makes their science incomplete and dangerous. If you send these new genetic structures out into the world, into hundreds of thousands of acres, you're going into the world with a premature application of a scientific principle."

— *Emeritus Professor Richard Strohman, Department of Molecular and Cell Biology, University of California at Berkeley*



"The real threat to the future is the irresponsible and premature

releases of the first generation of GMOs that are full of unsound scientific assumptions, rife with careless science, and arrogantly dismissive of valid concerns. The technology is inadequately developed to ensure its safety."

— *Professor Patrick Brown, College of Agriculture & Environmental Science, University of California*



"I view the Food and Drug Administration's policy and practices

regarding genetically engineered food to be irresponsible and the consequent risk posed for public health to be substantial."

— *Professor Philip J. Regal, College of Biological Sciences, University of Minnesota (St. Paul)*

Actions to keep Australia GE-free

READ FOOD LABELS using the *True Food Guide*, available from www.truefood.org, and follow its guidelines on GE-free foods.

BUY LOCAL FRESH FOODS labelled 'Product of Australia'. Foods labelled 'Made in Australia' may contain imported GE ingredients, including some GE soy products (oil, lecithin, flour, protein isolate) and some GE corn (high fructose syrup, corn starch, corn chips).

KNOW ABOUT VEGETABLE OILS. Most Australian cottonseed oil is GE and it's used by many fast food outlets to deep fry. Ask the shop what they use. Buy organic or unblended oils such as olive, macadamia, grape seed, mustard seed and other select oils. See the *True Food Guide* for details.

TALK TO FOOD STORE MANAGERS and ask them to stock only GE-free foods.

ASK THE PROCESSORS OF FOODS that you buy to ensure their products are GE-free.

CONTACT YOUR MEMBERS OF PARLIAMENT and ask them to keep Australia GE-free.

GROW YOUR OWN FOOD, preferably from organic seed.

GET ACTIVE IN YOUR LOCAL COMMUNITY, and ask the council to make its food services — Meals on Wheels, neighbourhood houses and crèches, etc. — GE-free. A GE-free information booklet can be downloaded from www.geneethics.org.



YES, I WANT TO SUPPORT gene ethics working for a GE-free future

PLEASE FILL IN THE FORM BELOW and FREE-POST to Gene Ethics, Reply Paid 79784, Carlton Victoria 3053
OR DONATE BY CREDIT CARD ONLINE at www.egive.org.au
OR DONATE BY PHONE on 1300 133 868 (local call fee) ■ (All donations of \$2 and over are tax deductible)

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SUPPORT GENE ETHICS

- Participate in the Gene Ethics network and help to keep Australian food and our environment GE-free.
- Work with other active opponents of GE manipulation in your area. Ask Gene Ethics how.
- Information and action kits are also available by browsing the Gene Ethics website, emailing or phoning.
- See Gene Ethics contact details below.



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