

Submission to FNDC

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Introduction – concerned global citizen

My submission and why

What is a GMO?

A GMO (genetically modified organism) is the result of a laboratory process where genes from the DNA of one species are extracted and artificially forced into the genes of an unrelated plant or animal. The foreign genes may come from bacteria, viruses, insects, animals or even humans. Because this involves the transfer of genes, GMOs are also known as “transgenic” organisms. This process may be called either Genetic Engineering (GE) or Genetic Modification (GM); they are one and the same. Genetic engineering is a term used to describe biotechnological methods used by scientists to directly manipulate an organism’s genome

What is a gene?

Every plant and animal is made of cells, each of which has a center called a nucleus. Inside every nucleus there are strings of DNA, half of which is normally inherited from the mother and half from the father. Short sequences of DNA are called genes. These genes operate in complex networks that are finely regulated to enable the processes of living organisms to happen in the right place and at the right time.

How is genetic engineering done?

Because living organisms have natural barriers to protect themselves against the introduction of DNA from a different species, genetic engineers must force the DNA from one organism into another. Their methods include:

Using viruses or bacteria to “infect” animal or plant cells with the new DNA.

Coating DNA onto tiny metal pellets, and firing it with a special gun into the cells.

Injecting the new DNA into fertilized eggs with a very fine needle.

Using electric shocks to create holes in the membrane covering sperm, and then forcing the new DNA into the sperm through these holes.

Gene insertion process: Shoot a gun with millions of cells to clone the cells in the plant. Add a virus to turn the gene on. Process of insertion and cloning creates huge collateral damage. Creates hundreds of mutations of the DNA of plants. Creates an unpredictable foreign signature of gene sequence that does not exist in nature. Our immune system cannot read this new sequence and therefore sends ‘destroyers’ to destroy the unknown invaders thereby producing inflammation in the gut which then leads on to...

\* bacteria

Is genetic engineering precise?

The technology of genetic engineering is currently very crude. It is not possible to insert a new gene with any accuracy, and the transfer of new genes can disrupt the finely controlled network of DNA in an organism. Current understanding of the way in which DNA works is extremely limited, and any change to the DNA of an organism at any point can have side effects that are impossible to predict or control. The new gene could, for example, alter chemical reactions within the cell or disturb cell functions. This could lead to instability, the creation of new toxins or allergens, and changes in nutritional value.

Genetic engineering is completely different from traditional breeding and carries unique risks. In traditional breeding it is possible to mate a pig with another pig to get a new variety, but is not possible to mate a pig with a potato or a mouse. Even when species that may seem to be closely related do succeed in breeding, the offspring are usually infertile—a horse, for example, can mate with a donkey, but the offspring (a mule) is sterile.

With genetic engineering, scientists can breach species barriers set up by nature. For example, they have spliced fish genes into tomatoes. The results are plants (or animals) with traits that would be virtually impossible to obtain with natural processes, such as crossbreeding or grafting.

What combinations have been tried?

It is now possible for plants to be engineered with genes taken from bacteria, viruses, insects, animals or even humans. Scientists have worked on some interesting combinations:

- Spider genes were inserted into goat DNA, in hopes that the goat milk would contain spider web protein for use in bulletproof vests.  
Cow genes turned pigskins into cowhides.  
Jellyfish genes lit up pigs' noses in the dark.  
Arctic fish genes gave tomatoes and strawberries tolerance to frost. Human genes into corn for spermicide

Field trials have included:

Corn engineered with human genes (Dow)

Sugarcane engineered with human genes (Hawaii Agriculture Research Center)

Corn engineered with jellyfish genes (Stanford University)

Tobacco engineered with lettuce genes (University of Hawaii)

Rice engineered with human genes (Applied Phytologics)

Corn engineered with hepatitis virus genes (Prodigene)

Potatoes that glowed in the dark when they needed watering.

Human genes were inserted into corn to produce spermicide.

Does the biotech industry hold any promise?

Genetic modification of plants is not the only biotechnology. The study of DNA does hold promise for many potential applications, including medicine. However, the current technology of GM foods is based on obsolete information and theory, and is prone to dangerous side effects. Economic interests have pushed it onto the market too soon, before proper assessments of long term effects have been made. Moreover, molecular marker technologies – so called Marker Assisted Selection (MAS) used with conventional breeding – show much promise for developing improved crop varieties, without the potentially dangerous side effects of direct genetic modification.

What it is doing?

Body doesn't recognise the invading organism so sends antibodies to the site which creates inflammation. 1996 GE foods introduced into US diet. Chronic illness is now so epidemic, never seen before. What has changed? Our food has changed. GE is a radical experiment on humanity. Consumers too busy with their lives trying to stay well. Inflammation in the gut is a precursor to most disease. GM creates a mutation in DNA in the genes and proteins. Causes inflammation which can lead to diabetes, alzheimers, parkinsons, infertility, birth defects, Autism, leaky gut, allergies, birth defects, diabetes, thyroid problems, heart disease, auto immune disease..

Millions of hectares in GE crops – large uncontrolled experiments. Cattle are dying after 2/3 months of being fed on exclusively fed GMO feed

### **Two types of GE – BT and roundup ready herbicide resistant seeds**

Glyphosphate – round up ready

Glyphosate (*N*-(phosphonomethyl)glycine) is a broad-spectrum systemic herbicide and crop desiccant. It is an organophosphorus compound, specifically a phosphonate. It is used to kill weeds, especially annual broadleaf weeds and grasses that compete with crops. It was discovered to be an herbicide by Monsanto chemist John E. Franz in 1970.<sup>[3]</sup> Monsanto brought it to market in 1974 under the trade name Roundup, and Monsanto's last commercially relevant United States patent expired in 2000.

Farmers quickly adopted glyphosate, especially after Monsanto introduced glyphosate-resistant Roundup Ready crops, enabling farmers to kill weeds without killing their crops. In 2007, glyphosate was the most used herbicide in the United States' agricultural sector and the second-most used in home and garden, government and industry, and commerce.<sup>[4]</sup> By 2016 there was a 100-fold increase in the frequency of applications and volumes of glyphosate-based herbicides (GBHs) applied, partly in response to the unprecedented global emergence and spread of glyphosate-resistant weeds.<sup>[5]:1</sup>

Glyphosate is absorbed through foliage, and minimally through roots,<sup>[6][7][8]</sup> and transported to growing points. It inhibits a plant enzyme involved in the synthesis of three aromatic amino acids: tyrosine, tryptophan, and phenylalanine. Therefore, it is effective only on actively growing plants and is not effective as a pre-emergence herbicide. An increasing

number of crops have been genetically engineered to be tolerant of glyphosate (e.g. Roundup Ready soybean, the first Roundup Ready crop, also created by Monsanto) which allows farmers to use glyphosate as a postemergence herbicide against weeds. The development of glyphosate resistance in weed species is emerging as a costly problem. While glyphosate and formulations such as Roundup have been approved by regulatory bodies worldwide, concerns about their effects on humans and the environment persist.<sup>[5][9]</sup>

Many regulatory and scholarly reviews have evaluated the relative toxicity of glyphosate as an herbicide. The German Federal Institute for Risk Assessment toxicology review in 2013 found that "the available data is contradictory and far from being convincing" with regard to correlations between exposure to glyphosate formulations and risk of various cancers, including non-Hodgkin lymphoma (NHL).<sup>[10]</sup> A meta-analysis published in 2014 identified an increased risk of NHL in workers exposed to glyphosate formulations.<sup>[11]</sup> In March 2015 the World Health Organization's International Agency for Research on Cancer classified glyphosate as "probably carcinogenic in humans" (category 2A) based on epidemiological studies, animal studies, and *in vitro* studies.<sup>[9][12][13]</sup> In November, 2015, the European Food Safety Authority published an updated assessment report on glyphosate, concluding that "the substance is unlikely to be genotoxic (i.e. damaging to DNA) or to pose a carcinogenic threat to humans." Furthermore, the final report clarified that while there may be other, probably carcinogenic, glyphosate-containing formulations, studies "that look solely at the active substance glyphosate do not show this effect."<sup>[14][15]</sup>

Is a chelator in plants which stops the plant from absorbing nutrients – steals nutrients. They become weak and sick. They are then fed to animals which are then fed to humans. It has been found in human breast milk, unborn fetus', infant formula using corn and soy syrups. No long term health studies done. Found in unborn babies bloodstreams in sprayed areas found to directly cause birth defects. Manganese and trace minerals missing. Tests done. Now plants have become round up resistant they are talking about using 24D (agent orange). Crops are completely immune now. Traces of round up are found everywhere in the food chain. Yields are lower.

But the chemical is omnipresent in Europe. Residue has been found in German beer, British bread and the urine of members of the European Parliament.

#### **BT** -

Monsanto has also developed a protein called the Bt delta endotoxin. The Bt delta endotoxin was selected because it is highly effective at controlling Lepidoptera larvae, caterpillars. It is during the larval stage when most of the damage by corn borer occurs.. To kill a susceptible insect, a part of the plant that contains the Bt protein (not all parts of the plant necessarily contain the protein in equal concentrations) must be ingested. Within minutes, the protein binds to the gut wall and the insect stops feeding. Within hours, the gut wall breaks down and normal gut bacteria invade the body cavity. The insect dies of septicaemia as bacteria multiply in the blood. Even among Lepidoptera larvae, species differ in sensitivity to the Bt protein. A donor organism may be a bacterium, fungus or even another plant. In the case of Bt corn, the donor organism is a naturally occurring soil

bacterium, *Bacillus thuringiensis*, and the gene of interest produces a protein that kills Lepidoptera larvae, in particular, European corn borer. This protein is called the Bt delta endotoxin. Growers use Bt corn as an alternative to spraying insecticides for control of European and southwestern corn borer. Farmers in at least two Illinois counties have experienced severe damage from corn rootworm this growing

Monsanto has planted millions of hectares of Bt cotton in India where there is a huge backlash against the company as farmers are unable to afford to buy seed which they have traditionally kept for generations. Workers report severe rashes & itching. BT corn produces an insecticide which breaks the cell walls of insects – what effect does this have on human stomachs? Studies show BT corn makes smaller sicker babies. Causes fertility problems. Since 1996 when this technology was unleashed in the food chain in the US, huge decline in fertility in the US and also in cattle. Like an epidemic reproductive disorder. New organisms have been found with the properties of a fungus.

### **rBGH**

Was also developed by Monsanto. It is a genetically engineered artificial hormone which injected into dairy cows to make them produce more milk. Despite opposition from scientists, farmers and consumers, the US currently allows dairy cows to be injected with recombinant bovine growth hormone (rBGH), also known as recombinant bovine somatotropin (rBST). RGH injected into cows to increase milk production, the cow's immune system reacts by creating pus and inflammation, more antibiotics are given and the cycle continues through into the food chain. What are the long term effects of this in our food chain. Many countries including NZ have banned this product.

### **Biotechnology – Monsanto & FDA**

Monsanto's goal is to replace all natural seed with GMO seeds and create a market for this seed. This is not sustainable farming. Farmers who have traditionally for centuries kept seed for subsequent seasons cannot do so. Farmers who have seed cleaning businesses in the US are being pressured by Monsanto to give the names of farmers who are not using GE seeds. These are known as Terminator seeds which do not reproduce. Farmers have to purchase every season at huge financial cost. While their website does not expressly state it, it is widely believed that the mission of Monsanto is to take over the entire food production of the planet. It is happening in every country in the world. This has been termed as a kind of biowarfare. It is big business and it is scary.

FDA policy maker Michael Taylor is the former Monsanto attorney and vice president and has now gone back to the FDA as the Food Safety czar.

There is a perception that there have been numerous studies done on the long term effects of GM foods on the body. This is not true. Doesn't monitor GMO studies. Leaves it up to Monsanto to do studies. It can put food products on the market without telling the FDA or consumers. Monsanto is in the business of selling chemicals. Corporate funding into universities – many professors speaking out in defence of non-GMO have lost their jobs. Cant present negative research. Huge influence in industry. A study by 800 world scientists

agreed that this is biowarfare on food. Huge bullies. They appoint pro GMO experts in GMO industry.

If another crop is contaminated by GE seed, then those farmers are being sued by Monsanto for having their patented seeds growing on their land without a license and are not paying royalties. People have no choice as will cross pollinate without them knowing. Farmers are losing their farms because they become bankrupt by the court cases with Monsanto – they lose their money, homes, farms to pay court costs. FDA says no safety studies are necessary. Claimed scientists said GE is safe but it is a lie. Institute of Science in Society - Signed by 815 scientists from 82 different countries, including:

*Open Letter from World Scientists to All Governments Concerning Genetically Modified Organisms*

The World Scientists Statement dates from 1999. It was superseded by the Independent Science Panel Report in 2003, and by the most recent report *Ban GMOs Now* in 2013.

- The scientists are extremely concerned about the hazards of GMOs to biodiversity, food safety, human and animal health, and demand a moratorium on environmental releases in accordance with the precautionary principle.
- They are opposed to GM crops that will intensify corporate monopoly, exacerbate inequality and prevent the essential shift to sustainable agriculture that can provide food security and health around the world.
- They call for a ban on patents of life-forms and living processes which threaten food security, sanction biopiracy of indigenous knowledge and genetic resources and violate basic human rights and dignity.
- They want more support on research and development of non-corporate, sustainable agriculture that can benefit family farmers all over the world.

**Percy Schmeiser** (born January 5, 1930) is a farmer from Bruno, Saskatchewan, Canada. He specializes in breeding and growing canola. He became an international symbol and spokesperson for independent farmers' rights and the regulation of transgenic crops during his protracted legal battle with multinational agrichemical company Monsanto. He was the subject of the 2009 film *David Versus Monsanto*.<sup>[1]</sup>

In 1997, Percy Schmeiser found Monsanto's genetically modified "Roundup Ready Canola" plants growing near his farm. He testified that he sprayed his nearby field and found that much of the crop survived, meaning it was also Roundup Ready.<sup>[2]</sup> He testified that he then harvested that crop, saved it separately from his other harvest, and intentionally planted it in 1998.<sup>[2]</sup> Monsanto approached him to pay a license fee for using Monsanto's patented technology without a license. Schmeiser refused, claiming that the actual seed was his because it was grown on his land, and so Monsanto sued Schmeiser for patent infringement on August 6, 1998.<sup>[2]</sup>

For the next several years, the case traveled through the Canadian court system. Meanwhile, Schmeiser became a popular figure among those opposed to genetic engineering. He accepted speaking engagements around the world. Ultimately, a Supreme Court 5-4 ruling found in favor of Monsanto, because Monsanto owned a valid patent and Schmeiser violated the patent by intentionally replanting the Roundup Ready seed that he had saved.<sup>[3]</sup>

On August 11, 1999, Schmeiser filed a separate lawsuit against Monsanto for ten million dollars for "libel, trespass, and contamination of his fields with Roundup Ready Canola".<sup>[4]</sup> As of 2007, Schmeiser had not started to prosecute that lawsuit. In 2002 Schmeiser's wife filed suit against Monsanto for \$140 plus costs for costs to remove contamination of her organic garden with volunteer GM canola; the case was dismissed. Schmeiser discovered Roundup Ready Canola in his fields in 2005. He contacted Monsanto to have the company remove it, but when Monsanto conditioned doing so on Schmeiser signing a confidentiality agreement and a release from litigation, Schmeiser had the cleanup done and billed Monsanto for the \$660 cost. When Monsanto refused to pay, Schmeiser sued in small claims court.<sup>[7]</sup> On March 19, 2008 Monsanto settled out of court, paying the \$660 without stipulation.<sup>[8]</sup>

Schmeiser served as mayor of Bruno from 1966 to 1983, and also as member of the Legislative Assembly of Saskatchewan for the Watrous constituency for the Liberal Party of Saskatchewan from 1967 to 1971.<sup>[9]</sup> Schmeiser has served as a town councillor of Bruno since 2003 and currently serves as the deputy mayor.

Schmeiser was the recipient of the Merit Award for Dealer of the Year in 1984 by the Saskatchewan Manitoba Implement Dealers Association. He was appointed to Saskatchewan's Real Estate Commission in 1993 and served until 1999. In 2000, he received the Mahatma Gandhi Award for working for the good of society. In 2007, Percy Schmeiser and Louise Schmeiser were named winners of the Right Livelihood Award:

... for their courage in defending biodiversity and farmers' rights, and challenging the environmental and moral perversity of current interpretations of patent laws.<sup>[10]</sup>

As established in the original Federal Court trial decision, Percy Schmeiser, a canola breeder and grower in Bruno, Saskatchewan, first discovered Roundup-resistant canola in his crops in 1997.<sup>[4]</sup> He had used Roundup herbicide to clear weeds around power poles and in ditches adjacent to a public road running beside one of his fields, and noticed that some of the canola which had been sprayed had survived. Schmeiser then performed a test by applying Roundup to an additional 3 acres (12,000 m<sup>2</sup>) to 4 acres (16,000 m<sup>2</sup>) of the same field. He found that 60% of the canola plants survived. At harvest time, Schmeiser instructed a farmhand to harvest the test field. That seed was stored separately from the rest of the harvest, and used the next year to seed approximately 1,000 acres (4 km<sup>2</sup>) of canola.

At the time, Roundup Ready canola was in use by several farmers in the area. Schmeiser claimed that he did not plant the initial Roundup Ready canola in 1997, and that his field of

custom-bred canola had been accidentally contaminated. While the origin of the plants on Schmeiser's farm in 1997 remains unclear, the trial judge found that with respect to the 1998 crop, "none of the suggested sources [proposed by Schmeiser] could reasonably explain the concentration or extent of Roundup Ready canola of a commercial quality" ultimately present in Schmeiser's 1998 crop.<sup>[5]</sup>

Dispute[edit]

In 1998, Monsanto learned that Schmeiser was growing a Roundup-resistant crop and approached him to sign a license agreement to their patents and to pay a license fee. Schmeiser refused, maintaining that the 1997 contamination was accidental and that he owned the seed he harvested, and he could use the harvested seed as he wished because it was his physical property. Monsanto then sued Schmeiser for patent infringement, filing its case in Canadian federal court on August 6, 1998.<sup>[4]</sup> Negotiations to settle the matter collapsed on August 10, 1999, leading Schmeiser to file a countersuit against Monsanto for \$10 million for libel, trespass, and contaminating his fields.<sup>[6][7]</sup>

Patent rights versus property rights[edit]

Regarding the question of patent rights and the farmer's right to use seed taken from his fields, Monsanto said that because they hold a patent on the gene, and on canola cells containing the gene, they have a legal right to control its use, including the intentional replanting of seed collected from plants with the gene which grew accidentally. Schmeiser insisted on his "farmer's rights" to do anything he wished with seeds harvested from any plants grown on his field - including plants from seeds that were accidentally sown - and that this tangible property right overrides Monsanto's patent rights.

Canadian law does not mention any such "farmer's rights"; the court held that the farmer's right to save and replant seeds is simply the right of a property owner to use his or her property as he or she wishes, and hence the right to use the seeds is subject to the same legal restrictions on use rights that apply in any case of ownership of property, including restrictions arising from patents in particular. The court wrote: "Thus a farmer whose field contains seed or plants originating from seed spilled into them, or blown as seed, in swaths from a neighbour's land or even growing from germination by pollen carried into his field from elsewhere by insects, birds, or by the wind, may own the seed or plants on his land even if he did not set about to plant them. He does not, however, own the right to the use of the patented gene, or of the seed or plant containing the patented gene or cell."<sup>[4]</sup>

The FDA doesn't monitor GMO studies. Leaves it up to Monsanto to do studies. Monsanto is in the business of selling chemicals. Corporate funding into universities – all professors speaking out in defence of non-GMO have lost their jobs. Cant present negative research. Huge influence in industry



Future:

Huge industry for non-GMO products. Consumers want it. Consumer demand and education. Growers getting their properties verified. In the US there is no legal requirement to disclose GMO's nor label them. European consumers do not want GM foods but the European Union is pushing for it. Just in the past few weeks, organisations have pushed for a block on the renewal of glyphosate's license in Europe. European experts failed again to take a decision on whether to renew a licence for glyphosate, the world's widest-used weedkiller, (18-19 May). The EU standing committee on plants, animals, food and feed (Paff), which brings together experts of all EU member states, failed to organise a vote. There was no qualified majority for such a decision. The current licence expires on 30 June. The Paff committee was expected to settle on the matter already in March, but postponed the vote after France, Italy, the Netherlands and Sweden raised objections, mainly over the impact of glyphosate on human health. The European Commission has since tabled two new proposals, both of which failed to convince the member states. The health commissioner Vytenis Andriukaitis insists that member states decide with a qualified majority because of the controversies involved. If no decision is taken before 30 June, glyphosate will be no longer authorised in the EU and member states will have to withdraw authorisations for all glyphosate based products", the spokesperson said. The World Health Organisation (WHO) cancer agency last year classified glyphosate as "probably carcinogenic to humans".

As of 2013, GMO foods have to be labelled in New Zealand but I think that has changed and could not find any supporting evidence on the web. In the US no foods have to be labelled, so consumers have no idea what they are eating. Huge support for labelling in the US.

TPPA concerns

Benefits for NZ organic industry – unique opportunity in NZ

My work with international students

IRT – Institute for Responsible Technology – comprehensive source of GMO information on web

'Genetic Roulette'

'Bad Seeds'

'Food Inc'

'The Ecologist'