

Submission Cover Sheet

Review of the Moratorium on GM Canola

Submission Number: 3

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Attachments Submitted with this Submission:

- Gene transfer between canola (*Brassica Napus L.*) and related weed species, Brown et al.
- FOE Oilseed rape (canola) briefing paper

To obtain copies of these attachments please call the Review Panel Secretariat on (03) 9658 4874 or (03) 9658 4871

Submission – Review of the Moratorium on GM Canola

As a resident of South Australia I have many concerns about the possibility that Victoria will lift its moratorium on GM canola. Firstly there is the obvious problem of contamination by the many methods by which GM seed can be transported as can be seen below. GM-free canola receives a higher price than GM canola on world markets and the present gap of some \$50 is more likely to increase if more GM canola is planted in preference to conventional canola. I avoid all products containing genetically modified ingredients because I am well aware of the deleterious effects on bodies that consume them.

In that context therefore I do urge that GM canola remain on the prohibited list.

General Observations

The earth has maintained itself over several billion years in a state of homeostasis despite many cataclysms, species eliminations etc., and all without the benefit of technology. Today, however, humanity has a firm belief in the ability of technology to correct all of our detrimental effects on the environment. Technology has its uses but it can be acknowledged that we are not achieving what we need to do, in fact environmental degradation is leading us to the brink of our own species elimination.

Perhaps it is the belief of government officials and politicians, plus the ever-willing companies that tout biotechnology as the answer to nature's so-called inefficiency that has allowed that technology to become so intrusive in certain parts of the world. Set against these believers are the many well-qualified and knowledgeable scientists and researchers who have provided substantial and in many cases, peer-reviewed results, that reveal biotechnology has many serious negative effects on both the environment and human/animal health. **Instead of taking the Precautionary Approach** proponents of biotechnology promise it as the ultimate solution to our agricultural needs.

Anyone who has taken the time to examine alternative methods of providing the food that we humans and animals need to survive in a healthy state will be aware that conventional breeding of plants, Integrated Pest Management to minimise loss by insects, organic methods, rotation of and intermingling of crops, avoidance of monoculture etc., will be aware that we do not need biotechnology until such time that it can be proven to be no more harmful or obtrusive than traditional and enhanced methods of farming.

The following sections provide a very brief overview of already experienced harmful and negative effects of reliance on technology. I believe that a moratorium of at least another five years would not be out of the question.

Note: Attachment 176 contains some general information which relates to the tenor of this submission,

Contamination of Non-GM Crops

The biotechnology industry naturally prefers to believe, as does the Gene Technology Regulator, that only buffer zones of a marginal nature are sufficient to control the spread of pollen and seed from GM plants.

The current regulatory regime where GM and non-GM crops are allowed to grow in adjacent fields separated by tens or hundreds of metres is based on the assumption that the separation distances are sufficient to reduce cross-pollination levels to the acceptable minimum. Unfortunately pollen flow is not the only means of GM contamination. Other means involve GM seeds: impurities in the seed stock, volunteers from a previous crop, seeds dropped during transport, seeds inadvertently mixed by suppliers and during processing. Seeds persist much longer and can travel much farther. When the same machinery is used in several fields for harvesting, cultivation and spraying, seeds will be readily moved around from one field to another.

Evidence that pollen from genetically modified crops can cause contamination over considerable distances has emerged in a new report. 'The Dispersal of Maize Pollen' by Dr Jean Emberlin, Director of the National Pollen Research Unit, was commissioned by the Soil Association (UK) to "Establish hard scientific data on the risks posed to the integrity of organically grown maize and sweetcorn from cross-pollination by genetically modified crops"

The report states in part that: "Substantial evidence exists for long range transport of considerable numbers of pollen grains....Maize pollen remains viable under normal conditions for approximately 24 hours giving potential for pollination by grains that had travelled many hundreds of kilometres on the airflow....Overall it is clear that the maize pollen spreads far beyond the 200 metres cited in several reports as being an acceptable separation distance to prevent cross-pollination."

This new report undermines confidence in the advice given to the Government by ACRE who have so far given permission to trial GE crops at over 500 sites around the country. **At least 8 members of ACRE have direct links with biotech research, and 6 members are involved with companies that have been given permission by ACRE to conduct these trials.** The Soil Association believes that the apparent failure of ACRE to give impartial advice on the likelihood of cross-pollination threatens to remove choice from those who want to avoid GM contamination. [Note the preponderance of biotech interests]

But even the extent of cross-pollination is greatly underestimated, as has been pointed out, pollen can remain airborne for hours and a 25 miles-per-hour wind speed is not unusual, which is why extensive contamination of certified seed stocks had been detected as far back as 2003. A research team led by scientists at the US Environment Protection Agency in Corvallis, Oregon, used an atmospheric model of wind blowing above fields planted with GM bentgrass to look at GM pollen dispersal, combining modelling with actual analysis of cross pollination with non-GM plants of the same or related species The GM bentgrass carried the glyphosate tolerance trait, which provided a ready selectable marker for cross-pollination. [Van de Water PK, Watrud LS, Lee EH, Burdick C, King GA. Long-distance GM pollen movement of creeping bentgrass using modelled wind trajectory analysis. *Ecological Applications* 2007, 17(4), 1244-56]

. During extensive greenhouse and laboratory testing, glyphosate-tolerant progeny of non-GM test plants were found up to 21 km from the GM fields.

This was consistent with the model of wind direction and speed, which showed movement of pollen up to 15 km from the GM fields by the first hour; and maximum travel distances increased to 40 and 50 km after two and three hours respectively. The three-hour cut off period was based on previous findings that the viability of the grass pollen dropped to zero within three hours. These findings were at odds with previous small-scale experiments, involving hundreds of GM plants in small plots, which showed pollen dispersal limited to a few kilometres, basically

because the source of GM pollen was too small. It is like putting a drop of ink in an ocean, which soon gets diluted.

In the present experiment, GM bent grass was planted in 162 hectares, at about 2.8 million seeds per hectare. This provided realistically high pollen concentration for the estimation of pollen dispersal. The maximum potential spread of 21 km observed was an underestimate because pollen trapping plants were not set much further than the distance observed. According to the model, GM contamination could be as far as 75 km downwind of the GM field.

For the US to adopt a permanent ban on a crop could indicate that more such decisions could occur. Here is the information from a recent ISIS Press release: --

Approval of GM Crops Illegal, US Federal Courts Rule

In a surprising development that may well stump the further approval of GMOs, Federal Courts in the US have ruled against the Department of Agriculture (USDA) in three successive cases for failing to carry out proper environment impact assessment, making the original approvals of GM crops illegal.

The first case was on drug-producing GM crops. A federal district judge in Hawaii ruled in August 2006 that the USDA violated the Endangered Species Act as well as the National Environmental Policy Act in allowing drug-producing GM crops to be cultivated throughout Hawaii, and failing to conduct even preliminary investigations on environmental impact prior to the approval of planting. The plaintiffs were the Center for Food Safety, KAHEA (The Hawaiian Environmental Alliance), Friends of the Earth, and the Pesticide Action Network, North America. The defendants were the US Secretary of Agriculture and administrators of the USDA. From 2001 to 2003, four companies, ProdiGene, Monsanto, Hawaii Agriculture Research Center (HARC), and Garst Seed, were allowed to plant corn and sugarcane genetically modified to produce experimental pharmaceutical products such as vaccines, hormones, cancer fighting agents and other proteins that are still under development and hence not yet approved.

The plaintiffs argued that USDA/APHIS broke the law in issuing these permits. Because these crops produce pharmaceutical products that are still at the experimental stage of development, their effect on Hawaii's ecosystem (especially Hawaii's 329 endangered and threatened species) is unknown. The experimental crops could cross-pollinate with existing food crops, and contaminate the food supply. Animals feeding on the crops would also become unwitting carriers of pharmaceutical products, causing even more widespread dissemination of these experimental drugs.

The court concluded that APHIS' issuance of four permits was "arbitrary and capricious" and "an unequivocal violation of a clear congressional mandate" [1].

The second ruling was even more significant. A case was filed in Federal Court Washington DC against the trials of GM creeping bentgrass by the Center for Food Safety, Klamath-Siskiyou Wildlands Center, and other individuals and organizations in 2003. In February 2007, the court gave a decision that broadly affects field trials of *all* GM crops. Federal district judge Harold Kennedy ruled that the USDA must halt approval of all new field trials until more rigorous environmental reviews are conducted. USDA's past approval of GM herbicide-tolerant creeping bent grass led to widespread dispersal of pollen from the GM grass, and USDA's approval of bent grass trials was ruled illegal [2].

The third decision was on a case filed in Northern California by the Center for Food Safety, environment activists, seed producers and farmers. A Federal Court ruled (February 2007) that Monsanto's Roundup Ready alfalfa had been approved for commercial release illegally, because there had been no Environment Impact Statement. [3]. According to Center for Food Safety, The decision may prevent this season's sales and planting of Monsanto's GM alfalfa and future submissions of other GM crops for commercial deregulation.

Joseph Mendelson, spokesperson for the Center for Food Safety said to a reporter for *Science* journal [3] that his group may demand an end to sales of GM alfalfa or even a ban on planting GM seed already bought by farmers, while the USDA declined to comment, Predictably, perhaps, the pro-GM lobby has been toning down the significance of the claims [4], reporting that, “U.S. courts say transgenic crops need tighter scrutiny”.

In all three cases, USDA was found to have flouted the law and disregarded health and environmental concerns in their approvals of the GM crops. The failure to identify the locations and the exact nature of GM crops being tested must also be addressed along with the frivolous use of Confidential Business Information designations to conceal crucial information for safety evaluation and the persistent regulatory bias towards the uncritical acceptance of GM crops.

1. “Court rules federal government acted illegally in permitting field trials of genetically engineered crops in Hawaii.” Press Release Center for Food Safety, 14 August 2006. <http://www.centerforfoodsafety.org/Hawaii%20biopharm%20crop%20judgement%20Aug%2010,%202006.cfm>
2. “Federal court orders for the first time a halt to new field trials of genetically engineered crops”, Press Release, Center for Food Safety, 6 February 2007. http://www.centerforfoodsafety.org/GTBC_DecisionPR_2_7_07.cfm
3. “Federal court finds USDA erred in approving genetically engineered alfalfa without full environmental review” Press Release, Center for Food Safety, 8 February 2007.
4. “U.S. courts say transgenic crops need tighter scrutiny”, Dan Charles, News the Week, *Science* 2007, 315, 1069.

Note: Refer to attachment 096 for further detail

Marketing

In August 2006, WA’s Agriculture and food Minister Kim Chance stated that Western Australia’s canola growers were receiving premium prices for their crops due to the GM moratorium.

In 1998 canola prices were about AUD\$70 in favour of Canada but by May 2006 Australian prices were in excess of Canada’s by some AUD\$50 a tonne [source: DAFWA 2006] The Minister also said that Alberta, in July, had to provide \$261 million to help its farmers because of falling canola prices.

On a worldwide basis there is a general antipathy to foods derived from GM crops and processes and therefore Australia, and Victoria in particular, may well be advised to continue to trade on our “**clean, green, image**”.

Herbicide Tolerant Weeds

One of the unfortunate side effects of herbicide-resistant GM crops is an increase in the use of chemicals to eradicate weeds and the herbicide-resistant Weeds that are a by-product of them. GM canola, for example, easily crosses with wild radish and turnip. The environment is already flooded with toxic chemicals which are slowly but surely poisoning the soil, the waters they flow into and the humans who ingest them.

It is surely more far-sighted, and intelligent, to continue the development of conventional crops that do not require such large volumes of chemicals.

Drought Resistant Varieties

Drought resistant crops are already available as can be verified from the following information.

From 1981 through 2002, field investigations were conducted at Rodale Institute in Kutztown, Pennsylvania on 6.1 ha. Three different cropping systems: conventional, animal manure and legume-based organic, and legume-based organic.

The conventional system based on synthetic fertilizer and herbicide use, represented a typical cash-grain 5-year crop rotation (corn, corn, soybeans, corn, soybeans) that reflects commercial conventional operations in the region and throughout the Midwest. According to USDA 2003 data, there are more than 40 million ha in this production system in North America. Crop residues were left on the surface of the land to conserve soil and water; but no cover crops were used during the non-growing season.

The organic animal-based cropping represented a typical livestock operation in which grain crops were grown for animal feed, not cash sale. This rotation was more complex: corn, soybeans, corn silage, wheat, and red clover-alfalfa hay, as well as a rye cover crop before corn silage and soybeans. Aged cattle manure served as the nitrogen source and applied at 5.6 tonnes per ha (dry), 2 years out of every 5 immediately before ploughing the soil for corn. Additional nitrogen was supplied by the plough-down of legume-hay crops. The total nitrogen applied per ha was about 40 kilograms per year or 198 kg per ha for any given year with a corn crop. Weed control relied on mechanical cultivation, weed-suppressing crop rotations, and relay cropping, in which one crop acted as living mulch for another.

The organic legume-based cropping represented a cash grain operation without livestock. The rotation system included hairy vetch (winter cover crop used as green manure), corn, rye (winter cover crop), soybeans, and winter wheat. The total nitrogen added to this system per ha per year averaged 49 kg (or 140 kg per ha) per year with a corn crop). Both organic systems included a small grain, such as wheat, grown alone or inter-seeded with a legume. Weed control was similar in both organic systems.

Under drought conditions the organic yields were higher. The 10-year period from 1988-1998 included 5 years in which the total rainfall from April to August was less than 350 mm (compared with 500mm in average years). Average corn yields in those dry years were significantly higher (28 percent to 34 percent) in the two organic systems: 6938 and 7235kg per ha in organic-animal and organic-legume systems compared with 5333 kg per ha in the conventional system.

During the extreme drought of 1999 (total rainfall between April and August only 224mm), the organic animals system had significantly higher corn yields (1511 kg per ha) than either the organic legume (421 kg per ha) or the conventional (1100kg per ha). Crop yield in the organic legume were much lower in 1999 because the high biomass of the hairy vetch winter cover crop used up a large amount of the soil water. During the 1999 drought soybean yields were 1400, 1800 and 900 kg per ha for organic animal, organic-legume and conventional.

An ISIS Press Release dated Feb. 14, 2001 referred to cotton crops in Indonesia.

Admittedly Victoria does not grow cotton in but the yields of GM versus conventional cotton are revealing - Monsanto planted 500 hectares of GM cotton within 9 districts of Sulawesi, Indonesia in open 'field trials'. This came to light when the company invited journalists to one of the sites where it claimed the GM cotton out-performed the indigenous variety planted side-by-side. Konphalindo, a public interest organisation dedicated to environmental protection, demanded information from the Department of Agriculture, especially the risk assessment required for approval of the field trials. That was six months ago. The Department of Agriculture provided no information on risk assessment, despite repeated requests. Konphalindo wrote a letter to the top national newspaper Kompas, which triggered investigations by its journalist.

It transpires that the GM cotton failed to out-perform the indigenous variety in all but one of the 9 districts. Worse yet, the GM cotton succumbed to drought and the brown hopper. Vivid photographs showed the browned-out GM cotton field next to the lush green field of indigenous cotton, which is resistant to both drought and the brown hopper. One of the photos appeared in Kompas (8 Feb.) under the headline, "GM cotton in Sulawesi Suspected Illegal". Hira Jhamtani, founder of Konphalindo, said, "If Monsanto hadn't boasted of their 'success', we would never have found this out. We suspect that no safety assessment had been carried out at all."

No doubt you will be aware that SARDI in South Australia has developed a strain of drought resistant wheat using conventional breeding methods. This is a much more satisfactory method for farmers because it cuts out GM seed premiums and the additional herbicide they can spray on GM crops.

Gm Foods Affect health

If GM crops are safe to eat some explaining needs to be done in those cases where animals die, become seriously ill, or have a shortened lifespan. Some examples of these are provided.

An ISIS Press release dated 14th January 2004 stated that - Twelve dairy cows died after being fed GM maize and silage. This happened on a farm in Woelfersheim in the state of Hesse, Germany.

According to the report by Greenpeace Germany, "common errors in feeding and infections had by and large been ruled out as the cause of death", and the farmer involved, Gottfried Glöckner, a supporter of GM crops, now suspects that Syngenta's GM maize Bt 176 is to be blamed. Bt 176 contains multiple complex traits, including insect resistance – conferred by a toxin from the soil bacterium *Bacillus thuringiensis* – and tolerance to the herbicide glufosinate. It was produced initially by the company Ciba-Giegy in 1994, and acquired subsequently by biotech giant Syngenta.

Glöckner has been growing Bt 176 increasingly in his fields since 1997, and in 2000 and 2001, switched over entirely to GM maize. Shortly thereafter, five of his cows died within four months in 2001, and another seven in 2002. The rate of milk production decreased in some of the remaining cows and others had to be slaughtered because of unknown illnesses.

Here is a report that indicates human health could be compromised by eating GM corn - The Independent "Secret Monsanto study showed rats fed GM corn had abnormal kidneys and blood" 22 May 05

http://news.independent.co.uk/world/science_technology/story.jsp?story=640430

The most disturbing aspect of the revealed Monsanto report is that regulators in USA & EU failed to make public studies showing health impacts on rats. The fact that most of the GM corn and corn products have not been labelled in US and Canada means that the human effects will have gone undetected and the rat studies were labelled confidential business information to protect the sale of GM corn. (Professor Joe Cummins, Canada)

Revealed: health fears over secret study into GM food

Rats fed GM corn due for sale in Britain developed abnormalities in blood and kidneys

By Geoffrey Lean, Environment Editor
22 May 2005 The Independent

Rats fed on a diet rich in genetically modified corn developed abnormalities to internal organs and changes to their blood, raising fears that human health could be affected by eating GM food.

The Independent on Sunday can today reveal details of secret research carried out by Monsanto, the GM food giant, which shows that rats fed the modified corn had smaller kidneys and variations in the composition of their blood.

According to the confidential 1,139-page report, these health problems were absent from another batch of rodents fed non-GM food as part of the research project.

Although Monsanto last night dismissed the abnormalities in rats as meaningless and due to chance, reflecting normal variations between rats, a senior British government source said ministers were so worried by the findings that they had called for further information.

A study by a well-respected Russian researcher made the headlines in 2005 revealed that : –

Alarming findings dismissed by regulators

Female rats fed genetically modified (GM) soya gave birth to excessive numbers of severely stunted pups with over half of the litter dead by three weeks, and the surviving pups are sterile. These alarming findings came from the laboratory of senior scientist Dr. Irina Ermakova at the Institute of Higher Nervous Activity and Neurophysiology of the Russian Academy of Sciences in Moscow. The experiments began two years ago, and the initial findings hit the world press when Ermakova was invited to speak at the 11th Russian Gastroenterological Week in Moscow in October 2005. What is of interest are findings of a UK study of GM food fed to rats.

UK's Advisory Committee on Novel Foods and Processes (ACNFP) has been systematically biased in favour of studies that fail to show significant effects of GM food and feed right from the beginning. Not surprisingly, it continued to cite research that's seriously flawed as evidence against Ermakova's findings, and Ermakova has lodged her own protest. One particular study cited by the ACNFP to bolster its GM bias used a batch of GM soya harvested in a middle of a certain field in South Dakota, processed by a commercial company, and fed to mice of indeterminate age and body weight. These factors alone would make the experiments invalid and totally unreplicable. Furthermore, the remarkable similarities in the composition of the GM and non GM diet - both supposed to contain 21.35 percent soya meal - is simply beyond belief. There were no standard deviations to the figures provided; 59 out of 78 of the figures were identical to 2 - 3 significant figures, and the rest differed so slightly that they would have been within standard errors. Could it be that the researchers have been feeding both groups the same diet? There is no evidence that the two diets were different, no DNA tests on the food samples were performed to ascertain that one was GM and the other non-

GM. This contrasts with the investigations carried out by Ermakova, who has been updating her results on her website (<http://irina-ermakova.by.ru/eng/>), and urging other scientists to repeat the experiments; all the more important now, as since publishing the initial results, her funding has been cut, and she is strongly discouraged from pursuing this line of research. Suppression and victimisation of honest, independent scientists has now become routine while obfuscation and misrepresentation are perpetrated at the highest levels, most recently by UK Prime Minister Tony Blair, who once again, blames the controversy over GM foods, along with MMR vaccine, stem-cells and BSE (!) on the "anti-science brigade" that "threatens our progress and our prosperity".

Date: Wed, 17 May 2000 06:11:38 EDT

Subject: The Guardian on "organic food": not risky

GM TRIALS THREATEN UK HONEY BEE KEEPERS MOVE HIVES AWAY FROM GM SITES

Friends of the Earth is calling for an immediate ban on the outdoor testing of genetically modified oilseed rape and maize after shop-bought honey was found to contain GM pollen. The honey was purchased in an area where GM crops had been grown last year.

The British beekeeping industry is taking steps to ensure that its honey is free from GM contamination, and has advised its members to move hives at least 6 miles from the nearest GM trial site. However, if GM crops get full commercial approval the location of the GM sites will not have to be made public and beekeepers won't be able to move their hives.

The honey purchased by FOE was sent to Austria for analysis. Two samples (one from a jar of honey and one honeycomb) were found to contain genetically modified components from the biotech company Aventis (formerly AgrEvo) which tests its GM crops in the UK and is taking part in the Government's farm-scale trials programme. Last year Friends of the Earth discovered GM oilseed rape pollen in beehives over 2 and a half miles from the nearest GM trial site.

The discovery of honey containing GM pollen confirms fears that GM crops threaten the livelihoods of neighbouring farmers and bee keepers. Despite this, GM farmers are under no obligation to consult neighbouring farmers and beekeepers about the trials, and the Bee Farmers Association of the UK (which represents 350 commercial bee farmers throughout the country) has not been consulted about the siting or potential impact of GM sites.

Conclusion

There is sufficient reason to maintain a moratorium on crops produced by means of biotechnology using unproven methods of ensuring that transferred DNA will not result in adverse effects on the plants to which it is transferred.