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Gene Ethics Submission on
Victoria's Draft Biodiversity Strategy
"Biodiversity is Everyone's Business"
June 16, 2010

Genetically Manipulated Organisms: real threats to Victorian biodiversity

Introduction

In the United Nations International Year of Biodiversity 2010, Victoria's biodiversity strategy must take into consideration all threats to biodiversity, including the specific threats posed by genetic manipulation (GM) and genetically manipulated organisms (GMOs). The international community and parties to the Convention on Biological Diversity (CBD) have recognized these threats by negotiating the Biosafety Protocol, the first and only treaty negotiated by parties to the CBD. Yet the draft strategy "Biodiversity is Everyone's Business" does not even mention GM or GMOs, let alone the real threats posed by the international transfer, handling and use of GMOs.

The Biosafety Protocol

The draft produced by the Victorian government claims to meet our obligations under the UN CBD but makes no mention of the UN Biosafety Protocol, the first and only treaty negotiated under the CBD. Yet the Biosafety Protocol is an integral part of the CBD, with 156 states as members.

Australia has not signed or ratified the Biosafety Protocol but as a party to the CBD our national and state governments are obliged to adopt its rules. Australian biodiversity policy documents that do not include the impacts of GM and GMOs on biodiversity are significantly and seriously deficient. Yet the Australian Government's biodiversity documents and policies, including the 2009 National Biodiversity Strategy Review draft (and the current Victorian 'Biodiversity is Everybody's Business') consistently ignore the UN Biosafety Protocol and downplay issues of the ecological threats posed by GM and GMOs.

Government documents, which purport to fulfill our obligations under the UN CBD, must at least acknowledge the existence of the Protocol and mandate the development and implementation of biosafety policies and regulations designed to safeguard biodiversity from the ravages of GMOs. Though Australia has a national system of GM regulation, we cannot afford to be smug or complacent about the impacts that GMOs may have on natural ecosystems and biodiversity. There is an overwhelming international consensus in the UN CBD that GMOs pose a global risk to biodiversity that must be managed by an international treaty, and Australian governments should join this consensus and act on it.

Biodiversity threats include GM and GMOs

Gene Ethics advocates that GMOs and GM be included in the legislation so that any adverse impacts arising from these biodiversity-threatening processes and products can be effectively managed and monitored. We advocate that the release of GMOs into the environment be banned but if governments choose to license their general and unrestricted release, impacts on the environment and/or biodiversity must be monitored. New and emerging threats identified at the 2008 conference of parties to the UN CBD (COP9-MOP4) included GM fish, trees, viruses and pharmaplants.[1]

Regulating biodiversity protection

When parties to the UN CBD meet in Japan in October 2010 for the biannual conference of the parties (COP10), more than one of the three weeks of meetings will be spent negotiating biosafety regulations for GM. A large part of the CBD is about facilitating access to genetic resources and how these may be used by the GM industry. And during the week-long negotiations on the Biosafety Protocol (MOP5), parties to the CBD will craft regulations for the safe transboundary movement, handling and use of GMOs (called Living Modified Organisms (LMOs) in the Protocol) and international trade in GMOs. Liability and redress for any damage caused by GMOs will also be subject to negotiations.

UNEP Green Customs initiative, quarantine and GMOs

The Biosafety Protocol is also part of the UNEP Green Customs initiative. Although Australia has strict quarantine and customs regulations against the introduction of exotic organisms, plants and animals into Australia's uniquely biodiverse environment, similar regulations for protecting our biodiversity are not applied to GMOs. But GMOs are novel organisms which never existed in the environment so they must be treated and regulated with precaution. The Australian government, including AQIS, OGTR and the Department of Environment, should treat GMOs with the caution now applied to exotic species with the potential to be invasive.

GMOs pose unique and unpredictable risks

GMOs are unique so they can pose unexpected, unpredictable and uncertain risks. This was recognised by the parties to the CBD which negotiated the Biosafety Protocol treaty. For example, the 'ice minus' GM microorganism would not nucleate ice crystals. The proposed industrial use of this GMO was to spray it onto strawberries and tomatoes to prevent frost damage. Its release was disallowed over biosafety concerns that in the wider environment it might adversely affect ice formation in clouds and adversely affect hydrological cycles.

A stated goal in the draft policy is: "proactive and strategic intervention in planning and management processes that can potentially impact on biodiversity;" If this goal is to be met, the threats that GM and GMOs pose to biodiversity must be ameliorated.

The 'vision' of the draft includes: "Public, corporate and other organisations apply institutional processes that deliver the essential biodiversity outcomes." However, biodiversity outcomes will not be fully achieved unless the serious threats posed by GM and GMOs are part of the government's response to invasive species. Both the Australian and Victorian governments are out of step with the international community and UN CBD biosafety regulations.

1 http://www.cbd.int/doc/meetings/bs/mop-04/official/mop-04-10-en.pdf

Precautionary Principle

The draft strategy's strong guiding principles and goals, outlined in the seven categories, must be applied to regulating GMOs. The risk management principles in the draft include the Precautionary Principle (Principle 15 of the Rio Declaration) and other risk management principles. To adequately protect biodiversity, they must also be applied to GMOs. The CBD parties adopted this approach when negotiating the Biosafety Protocol, also applying the Precautionary Principle to the international transfer, handling and use of GMOs.

Again, our preferred position is to ban the introduction of GMOs into our food supply and our environment. However, if Governments license GMOs for release they need also to monitor and manage the numerous threats and risks to biodiversity. As it is, commercial GM crop licences are unconditional and do not include any monitoring, reporting or precautionary actions. The Victorian biodiversity strategy should reflect these imperatives, by including processes to monitor and manage the impacts of GM and GMOs on biodiversity.

Agriculture, biodiversity and GMOs

The draft strategy says: "There is a challenge for the agricultural sector to maintain high levels of productivity whilst ensuring sustainable practices that also include dividends for biodiversity values ... There is an increasing recognition of the inextricable link between ecosystem health and farm productivity which has led to new farming practices being adopted that work in partnership with natural systems." This trend should be encouraged by the investment of public research and development resources but Victorian government policy disproportionately backs GMOs. They are designed to entrench and intensify industrial practices, despite oil and phosphate reserves sharply declining and climate change making intensive agriculture less viable.

The IAASTD is the largest to-date intergovernmental study on future directions in agricultural science, technology and development. It concluded that GM is unlikely to provide effective solutions for global agriculture and, by overemphasizing and promoting intellectual property rights ahead of publicly-owned research, create obstacles to global food security. Recent editorials in the Scientific American (Editorial, August 2009) and Nature Biotechnology (volume 27 number 10, October 2009) report that GM patent owners refuse to supply the seed and approvals needed for independent health and environmental research and also prevent negative evidence from being published. Farming systems that are ecology-friendly and promote biodiversity should be nurtured and promoted by governments.

Australia lacks biosafety regulations and triggers for the EPBC Act

There has never been a thorough assessment of the impacts of GM canola on any Australian ecosystem or species. A scientific literature review shows there is limited information about the potential impacts of growing GM canola on biodiversity and the matters of national environmental significance listed under the EPBC Act. Australian assessments of the biosafety of commercial GMOs are deficient. The commercial cultivation of GM Roundup tolerant canola (*Brassica napus*) could impact environments of national significance listed under the EPBC Act.

In May 2002, the OGTR published "The biology and ecology of canola (Brassica napus)". The 32 page document makes no reference to biodiversity. Yet it reports: "… viable seeds of canola persisting in disturbed soils for at least 5 years and possibly up to 10 years or more in undisturbed soil (Masden 1962); (Pekrun et al. 1997b); (Vaughan et al. 1976) ... Despite the lack of Australian data, overseas studies suggest that high temperatures and low soil moisture availability experienced after harvest in Australia, may provide conditions to induce secondary dormancy which may

contribute to higher persistence rates than under European or Canadian conditions ... The persistence of viable canola seed in the soil under Australian field conditions is poorly understood and further research is needed." This research has never been done.

Most studies on GM canola test for acute toxicity and safety issues, not long-term and cumulative ecological impacts. Most research used to justify GMO approvals is not Australia specific and is mostly industry or industry-sponsored research. It tends to be biased, with results favourable to industry. However, a significant and growing body of peer-reviewed literature shows that a variety of harms are likely to be associated with the growing of GM crops, particularly GM canola. GM canola may hybridise with related weeds such as wild radish, turnip and charlock, that can invade natural environments. Resistance to Roundup herbicide (glyphosate) is already common in grasses and weeds in Australia. From the North American experience of cultivating GM crops, it seems probable that Roundup resistance will be increased by the introduction of Roundup tolerant GM varieties. Additional weed problems are likely in disturbed environments, on some public land and areas of national environmental significance. Experience in North America also suggests that herbicide tolerant GM canola will also likely lead to increased herbicide use, especially the use of more toxic herbicides as the efficacy of Roundup declines. Both glufosinate and glyphosate have negative impacts on wildlife and glufosinate is banned from broadacre agriculture in the EU.

The use of GM that results in the intensification of industrial farming practices is incompatible with long-term sustainable and environmentally friendly farming systems. For instance, a changed spectrum of pest insects and soil pathogens is now in Australian cotton that requires new chemical treatments (CSIRO: Emerging Cotton Pests, www.csiro.au/resources/pfre.html); GM soy is hastening the deforestation of Amazonia, new diseases and pests are in GM crops in India, and glyphosate tolerance has led to reintroduction of previously banned and more dangerous chemicals.

GM trees, GM fish, GM animals, GM insects

The development of GM trees also poses unique threats to forests while GM eucalypts are being released in the southern USA. GM trees are among the high risk areas of GMO release, identified by CBD parties at the most recent COP as requiring further expert advice. The release of any GM fish, GM animals or GM insects may also have serious impacts on biodiversity. Recognition of these threats and emerging issues, and regulations for managing them, need to be included in any government policy on biodiversity, to more adequately reflect CBD priorities.

GMOs as invasive species

The environmental release of GMOs is comparable to introducing new exotic species, some of which may be invasive. The policy document should recognise and incorporate these threats to biodiversity. For instance, the document says: "Global trade continues to provide potential pathways for new exotic organisms to invade terrestrial, freshwater, estuarine and marine habitats. New invasive species are constantly being discovered. Increased prevention and early detection measures are required to reduce the risk these species pose to biodiversity. For example, Japanese Wakame Seaweed (*Undaria pinnatifida*) was recently discovered at Apollo Bay. Unfortunately, the discovery of this pest occurred after the period when eradication may have been feasible."

These cautionary comments also apply to GMOs, which may pose unique and uncertain risks to biodiversity, as they are novel organisms which may not be substantially equivalent to their parent lines. This should be explicitly stated and discussed in the biodiversity strategy.

GM as biosecurity threat

GMOs pose threats to our state's biodiversity comparable to other serious biosecurity threats. Concerning biosecurity, the draft document says: "In response to the need for greater institutional co-ordination to tackle the state's biosecurity risk profile, the 2009 Biosecurity Strategy for Victoria advocated a 'whole-of-community' approach." GMOs deserve the same treatment.

GM as a driver of species persistence

GM and its acceleration of monocultures are recognised as posing a unique threat to the maintenance of genetic diversity within and between species. GM may confer survival advantage on manipulated organisms. GM constructs are also recognised as being able to move between species via Horizontal Gene Transfer. These aspects of GM need to be taken into account and mentioned in the section on 'drivers of species persistence' and the sections on maintaining functioning ecosystems and ecological processes, including maintenance and protection of genetic diversity. For instance in strategy's diagram on 'drivers of species persistence', GM and the introduction of any GMOs into the environment would affect on areas such as “Genetic inheritance of the species”; “Physical environment”;”Species interaction”;”New species interactions”;”New disturbances” and other areas moving into the future.

Recombinant DNA pollution/GM pollution

GMOs are living organisms which, like other exotic organisms, cannot be recalled once released into the environment. Moreover, unlike chemical pollution, recombinant DNA and GMOs are self-replicable so have the potential to exponentially increase their ecological effects. GM constructs and GMOs also become part of the food chain and ecological food web and may affect other species. Horizontal gene transfer and the movement of novel traits between species is also possible.

The emerging scientific field of 'gene ecology' studies these impacts. The biodiversity strategy document should recognise and include organisms with ecologically-affecting processes, such as GMOs. Failure to include or recognise them has negative flow-on effects such as failing to identify potentially threatening processes and take proactive cost-effective preventative measures. If we remain out of step with international biosafety science Australia's scientific expertise may also fall behind in important areas.

Conclusion

The draft document sections on Leadership, Mainstreaming and Working Together, Standards, Knowledge Management, Modernising Legislation etc, should all give full consideration to GM and GMOs. Strategic thinking about Victoria's biodiversity future and biodiversity policy will fail if it doesn’t include GMOs.

'Modernising Legislation' means Victoria's biodiversity policy must reflect current international standards. This approach will apply the CBD's Biosafety Protocol and the Precautionary Principle to genetic manipulation and its living GM products, and to international trade in GMOs.

Australian government’s policies on biodiversity ignore or minimize the internationally recognised and agreed threats posed to global biodiversity by GMOs. The CBD is in large part concerned with managing these threats via international cooperative efforts among all the parties. The Australian Government, as a party to the CBD, should also sign and ratify the Biosafety Protocol.

The Victorian government strategy cannot satisfy CBD requirements, as it does not adequately

reflect CBD priorities, including biosafety. Victoria is meanwhile investing heavily in GM organisms when its scarce research and development resources should be invested in making Victorian farms sustainable and compatible with biodiversity goals. Additional investments in biosafety and a more robust regulatory environment should also be priorities.

The State government should abandon its naïve and simplistic view of the potential for GMOs to contribute to sustainability and biodiversity goals. Biotechnologists have failed to produce evidence that their enterprise will produce positive results and ignore the impacts of existing commercial GMOs on the environment and biodiversity.

The draft document on Biodiversity fails completely to address GM issues. GM and GMOs must be included in Victoria's biodiversity policy and strategy, to conserve and protect the state's unique and precious biodiversity.

The draft strategy's strong goals and guiding principles for biodiversity strategy must be fully applied to GM and GMOs. Unless it does so, the Victorian government will be unable meet its obligations under the UN CBD and we will continue to challenge its veracity.