November 2, 2022

To: Forest Stewardship Council Board of Directors

RE: The need to stop the Genetic Engineering Learning Process

Dear FSC Board of Directors,

We are writing to share our analysis of the Forest Stewardship Council's Genetic Engineering Learning Process (GELP), including our response to the draft participation framework presented by the appointed panel of experts.

We are deeply concerned about the GELP and ask the FSC Board to decide against proceeding with Phase Two of the process. We believe this decision is necessary to protect forests from the concrete risks of the GELP activities.

The GELP asks FSC to accept the "possible" risks that accompany GE field trials. We argue that these risks are not, in fact, acceptable.

As observers to the FSC General Assembly, we participated in the two sessions about the Genetic Engineering Learning Process. These discussions increased our alarm about the GELP and lead us to articulate our concerns to you in the gravest terms. We are very concerned about the approach presented by the GELP expert panel.

The GELP proposes to establish an FSC governance model/participation framework for overseeing select field tests of genetically engineered (GE or genetically modified) trees. This engagement with field tests has been proposed as necessary to inform FSC's discussions of genetic engineering and of any possible changes to FSC's current policy prohibiting the commercial use of GE trees. However, field tests themselves present risks to forests and forest ecosystems. Any negative environmental and social impacts resulting from such tests would be the responsibility of the Forest Stewardship Council.

Field trials of GE trees pose risks to forests

Slides presented at the GA by the GELP panel of experts state that there are "possible" risks associated with confined field trials of GE trees. This acknowledgement of the risks reflects the recurring escape and spread of genetically modified organisms (GMOs) or genetic material from field tests and other sources.

In fact, our inability to contain genetically modified organisms (GMOs) – genetically engineered plants in particular - is a learning that is already available to the FSC; it needs to be considered by the FSC Board in deciding the future of the GELP.

Type of study	Potential risks?
Social, economic, and/or ecological issues (non-experimental)	Almost none
Confined laboratory/greenhouse	Extremely unlikely
Confined field trials	Possible
Unconfined field trials (ongoing)	Probably higher

From GELP expert panel presentation to FSC GA, October 9, 2022

In 2019, the Canadian Biotechnology Action Network (CBAN) published a report detailing the known escape and contamination incidents with GMOs in Canada:

- Some escapes were isolated incidents while others were widespread or ongoing contamination cases.
- Some events occurred with GMOs that were approved by regulators for cultivation (canola and flax), and others were unapproved experimental GE plants and animals (wheat and pigs).
- Escapes were observed from laboratory experiments, field tests, and commercial cultivation.
- Escape incidents occurred with large and small organisms.
- Escapes were due to diverse causes, some of which remain undetermined.

Our examination of these and other escape events around the world, leads us to conclude that human error, biology, pollinator and wind movement, extreme weather events, and other factors all make GE contamination likely and, in some cases, inevitable.

This key lesson of our inability to contain GMOs has been learned over and over, by companies, universities, farmers, and governments. In 2002, experimental GE pigs were accidently (illegally) placed in the Canadian food chain (the first of two incidents, at two different institutes) instead of being destroyed as biowaste; the Vice President of Research at the University of Guelph where the incident occurred, told the national newspaper *The Globe and Mail*, **"Things you don't expect to happen can happen."**

This example, along with others like it, illustrates the basic truth that the **containment of GMOs may fail even when containment seems feasible.** The incident also offers a warning to FSC that if there are negative impacts of field testing under the GELP, such outcomes are likely to be exposed publicly and FSC will be asked to account for the consequences.

Proposals to make GE trees sterile are common (including in the GELP draft framework *Annex 1: Examples of potential learning projects involving field trials*) because **the threat of escape is widely recognized**, but these technologies would not be reliable and would pose their own serious environmental and socio-cultural risks. It is extremely difficult to totally suppress reproduction, and **even a small amount of gene flow can result in the eventual spread of GE traits into the wild**.

Containment is a proposal rather than a guarantee. For example, Canadian regulation asks proponents to remove the root systems and monitor the ground for developing suckers for three consecutive years after field tests of GE poplar trees. These roots are numerous and tiny, increasing the likelihood of human failure in this management of plant material. This is just one example of a pathway of possible escape from field testing. The risks of escape are differentiated by variables such as tree species, ecosystem context, and the containment measures attempted, but cannot be entirely eliminated.

The "possible" risks of containment failure named by the GELP panel could have profoundly negative consequences. **The stakes are high because it can be difficult or impossible to recall GMOs once released.** GE contamination is living pollution that can self-replicate. Once GE contamination in forests begins, it may not be possible to stop its spread. If GE trees contaminate native forests, these forests will themselves become contaminants, creating a never-ending cycle. The impacts of such potential contamination are unknown and could remain unknown for generations.

Field testing GE trees can, additionally, pose other risks such as harm to organisms interacting with GE trees in trial sites. Unintended changes made to the tree through the processes of genetic engineering could, for example, result in altered nutrition or toxic compounds being expressed in leaves, impacting any food web intersecting with the trial site. (For some discussion of these risks, please see pages 23-27 of our report.)

Given the existing learnings on GMO escape and contamination, the key questions for the FSC Board are:

- *Does the Board, on behalf of FSC, FSC members, and the world's forests, accept the environmental risks posed by GE tree field trials?*

- *Do the benefits of the possible learnings warrant taking these risks?*

The draft participation framework says the GELP "governance structure" will be "in compliance" with the Precautionary Principle but the process does not uphold the Precautionary Principle. Given the risks posed by confined field tests and the vast unknowns relating to the environmental impacts, engaging with such tests itself runs counter to the Precautionary Principle. A member of the GELP panel also explicitly articulated this interpretation at the GA.

In addition to our concern over the risks posed by confined field trials, we share the following:

The approach of the GELP panel of experts is high-risk

- **The panel's approach shows a high tolerance for risk-taking**

Several GELP expert panel members who were present at the GA explicitly stated, several times, that **the greater the risks, the greater the learning**. This statement is correct but is a dangerous approach to the question of experimenting with genetically engineered trees. In our view, this approach suggests either an ignorance of the potential impacts of GE trees or a dangerously cavalier attitude towards the consequences for forests.

The expert panel's presentation to the GA posed the new question of whether or not to include unconfined field trials in the GELP as well as confined trials (those outdoor trials implementing containment measures as outlined by national governments). The fact that this question was asked raises serious concerns about the panel's understanding of the possible serious negative impacts of GE trees to forests and forest ecosystems, and their willingness to accept ever higher levels of risk.

In raising this question, the panel is asking FSC to consider accepting "possibly higher" risks than those "possible" risks of confined field trials. Unconfined field tests are those that have no government stipulations for any containment and where there is no government oversight. Such tests are not reported to government. Unconfined field trials of GE trees are a new and worrying development that is specific to those national governments removing regulation from (some or all) gene-edited seeds. (To our knowledge, the United States is the only country currently allowing unconfined GE tree field tests.)

- **The panel lacks the appropriate expertise to weigh the risks of GE trees to forests**

This high tolerance for risk-taking may be explained by the expertise in the panel. The stated goal of the learning process is to provide sufficient and trusted knowledge to FSC on genetic engineering but few panel members have expertise relating to the technology and biology, or to forests and ecosystems.

The paucity of expertise in forest ecology on the panel is of great concern because it appears, as discussed above, that the panel is ill-equipped to adequately understand the nature and consequences of the risks posed to forests by the proposed GELP activities.

Furthermore, the expertise on genetic engineering in the panel is dominated by one expert, Steven Strauss of Oregon State University in the U.S., who has spent two decades arguing that FSC should accept GE trees in its certification program. He has also argued that accepting contamination levels ("Low Level Presence") in some cases for GE grasses and trees could reduce the legal risks and costs of field testing. (His statements on FSC certification and government regulation are documented at www.stopgetrees.org/strauss-profile.)

The GELP learnings will be limited

- **Learnings from GELP field trials will be extremely limited**

The proposed GELP will likely result in ad-hoc, uneven learnings that may have little utility for FSC discussions of genetic engineering. Any learnings from the field tests will be limited to the specifics of those selected experimental trials. These trials will focus on select questions relating to certain GM traits in certain species, for a limited amount of time, in very specific and limited geographical and environmental contexts. The draft participation framework's *Annex 1: Examples of potential learning projects involving field trials* illustrates this limitation by listing six categories of GM traits that could be the potential subjects of tests.

This Annex also includes "the types of questions that might be pursued within them." However, the questions pursued in the trials will also be a select, few questions. These questions will be proposed by the product developers and will most likely also serve product development purposes. Questions proposed will also need to be limited to those that can be answered in the short three-year time frame proposed.

More generally, it is widely understood that field testing can provide only limited information about the potential impacts of commercially releasing GE trees. With GMOs, and GE trees in particular, the full environmental impacts will only emerge in the years and generations following release, and some impacts may remain unobserved, misunderstood, or may manifest only under very specific conditions (such as environmental stress).

- **Attracting GELP participants and accessing their information may require negotiation**

At the GA, the expert panel correctly raised doubts about the willingness of GELP participants (companies and research institutes) to conform to the draft participation framework. The panel noted the potential challenge of attracting applicants to the GELP and asked, "What are the benefits to participants – are these higher than the costs of participation?". This question raises a concern about actions that could be taken to attract participants.

GELP participants would not only be asked to manage their selected field tests as outlined in the framework - including designing and implementing additional processes for management and reporting - but would also be asked to share their information with the public: "all results, methods, and reports from approved projects will need to be made publicly available." The panel presentation of the GA stated one of five "novel and valuable" contributions of the GELP would be that it: "Creates mechanisms to allow access to reliable data and information (much of which is currently held in commercial-in-confidence), thus increasing transparency between industry and forestry-related stakeholders and communities." However, securing FSC-wide or public access to such information is unlikely.

Given the global experience with tight corporate control over patented GMOs, and in light of the public controversy over genetically engineered trees in particular, it should be expected that product developers will be reluctant to share their information publicly. In our view, **the possibility of negotiating access to private data raises concerns about the influence that participants could exert over the GELP**. Such influence could be magnified if participants provide some funding for the GELP as proposed.

We are concerned that the GELP will involve negotiations over the release of information and that **the panel of experts will be placed in a position to decide which information the FSC gets from participants and which will remain confidential business information.** Such mediation of access by a small group of people (with uneven expertise in the relevant fields) **could result in the provision of incomplete, possibly biased and unreliable, information.**

- **FSC is not a research organization and is ill-equipped to manage the roles and responsibilities required by this research project**

The draft participation framework states: "GE research, including field trials, is already permitted for certified companies in the FSC system, and we know that companies are conducting such research.

FSC currently has no involvement in the design of this research…" but we ask: Why would FSC expect or desire a role in designing GE tree field tests conducted by companies and research institutes?

FSC is not a research organization, nor is it set up to become one. FSC is not equipped to be involved in the design of experiments with GE trees. FSC does not have the necessary tools or expertise to oversee and evaluate the primary scientific research that the learning process proposes.

In our view, the GELP does not fill this gap. In particular, leaving the work of selecting field test applications and preventing harm from these tests to a small group of people underestimates the risks and the stakes involved.

The GELP could facilitate GE tree development and deployment

- **The GELP could create the impression that FSC is endorsing certain GE tree projects**

The Board should consider the possibility that the GELP may be seen as an FSC endorsement of the selected GE tree development projects. For example, the draft participation framework *Annex 1: Examples of potential learning projects involving field trials* includes the examples of testing herbicide tolerant trees and genetically engineered sterility (for example, stopping trees from producing flowers or pollen). **Does FSC support the development of these GE traits?**

FSC's engagement may not only be seen as an endorsement of such projects but may, in reality, serve to **sanction and concretely assist the development of extremely risky GE technologies.**

In fact, the panel presentation slides to the GA stated that, "We propose FSC to recognize that learning can occur, and shared value can be created, at all stages within the development pipeline of a GE product." This statement suggests that the panel understands the GELP as accompanying product development. This reflects the reality that field tests are part of the product development process and that most or all GELP participants would be product developers with commercial goals. FSC engagement could thereby serve to directly support the commercial pursuit of certain GE trees.

- **The development and use of GE trees is not inevitable**

As expressed in the GELP Frequently Asked Questions, the learning process is premised on the assumption that, "Genetic engineering in forestry is likely to continue to happen with or without FSC," along with the question of FSC's possible contribution in shaping this future. However, our new report "The Global Status of GE Tree Development: A Growing Threat" examines this question and finds that **the future for GE trees is highly uncertain**.

Aside from the first, and so far only, GE tree commercially planted (in China), even those GE trees that have been approved for planting have not yet been commercially released. The GELP panel presentation to the GA stated that, "some governments have approved specific varieties of GE trees for planting." However, to be precise: the Peoples Republic of China approved two GE insect-resistant poplars that were planted (2002), and regulators in Brazil approved a GE fast-growing[1]

[1] For discussion of the status of this trait, see page 29 http://www.stopgetrees.org/global-status-report.

eucalyptus from Suzano (2015) that is not commercially planted as well as varieties of Suzano's GE glyphosate-tolerant eucalyptus that are also not yet commercially released. In 2015, the US government confirmed that a GE loblolly pine from the company ArborGen was outside the mandate for government regulation and it is therefore legal to plant without any government risk assessment - however this GE tree has also not been commercially released. In fact, there are significant technical and political obstacles to the commercial use of GE trees, including FSC's current policy. Our research suggests that the release of GE trees is not inevitable, but that the implementation of the GELP may play a role in supporting their future.

In fact, the development and use of GM crop plants for over twenty years shows that **even the current reality of GM crop plants is limited**: Four genetically engineered crops account for 99% of global crop production; almost all GE crop plants are genetically engineered with either one or both of two GE traits; and just five countries account for around 90% of GE hectares around the world. Furthermore, just a few powerful companies – the biggest seed and agrochemical companies in the world – control the global market for GM seeds. Please see our attached background *The Global Status of GMOs*.

Conclusion

The GELP will be unable to ensure "risk avoidance" and is unlikely to meet its other stated goal of securing transparency about GE products and effects on the environment.

Learnings from the GELP will be limited and could come at a great cost; any learnings could come at the expense of forests.

In deciding whether or not to proceed with Phase Two of the GELP, the Board will need to accept taking the "possible" risks of field testing GE trees, and be prepared to be accountable for any potential consequences.

Sincerely,

Lucy Sharratt & Kaitlyn Duthie-Kannikkatt
Canadian Biotechnology Action Network

The Canadian Biotechnology Action Network (CBAN) is home to diverse, extensive experience monitoring and evaluating the environmental and social justice issues raised by the use of genetic engineering. CBAN brings together 15 groups from across Canada, to research, monitor and raise awareness about the impacts of genetic engineering on food sovereignty and environmental justice. CBAN members include farmer associations, environmental and social justice organizations, and regional coalitions of grassroots groups, and works in partnership with many allied groups internationally. CBAN is a project on the shared platform of MakeWay, a registered charity in Canada. www.cban.ca/trees

The Global Status of GMOs

Four genetically modified (GM or genetically engineered) crops account for 99% of global crop production. Almost all GM crops are genetically engineered with either one or both of two GM traits. Just five countries account for a majority of GM hectares around the world.

The limits of GMOs in food and farming

Just four crops – corn, canola, soy and cotton – account for 99% of the GM crops grown around the world. Most are used as animal feed, processed food ingredients, and biofuels. There are very few GM crops consumed as whole foods.

Eight crops account for the remaining 1% of GM crop production globally. These are a small amount of GM sweetcorn (grown in the US and Canada), GM virus-resistant squash varieties (grown in the US), GM virus-resistant papaya (grown in the US and China), GM eggplant (grown in Bangladesh), GM non-browning apple (grown in the US), GM sugar beet (grown in Canada and the US), GM potatoes (grown in the US), and GM alfalfa (grown in Canada and the US).

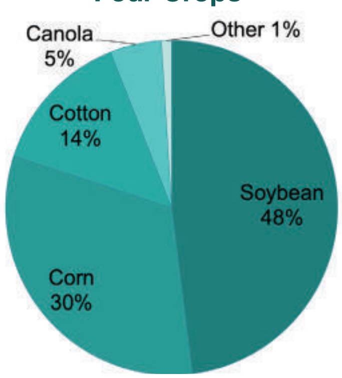
There is one GM animal currently produced for food: a fast-growing Atlantic salmon that is being produced in Canada and the US.

Two GM traits

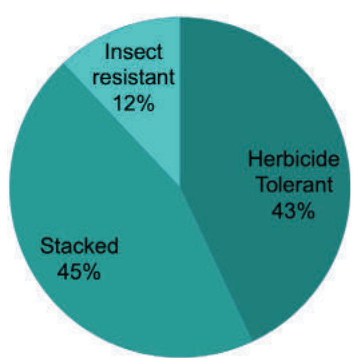
Almost all the GM crops grown around the world have either one or both of just two GM traits: herbicide tolerance and insect resistance.

88% of all GM crops are herbicide-tolerant, meaning that the plants are genetically engineered to survive spraying by specific, (mostly glyphosate-based) herbicides. Some of these crops are also “stacked” with the insect resistant trait, which means they are genetically engineered to be toxic to certain insect pests. The remaining 12% of the world’s GM crops are only insect-resistant. Less than 1% of GM crops have other GM traits, such as virus-resistance.

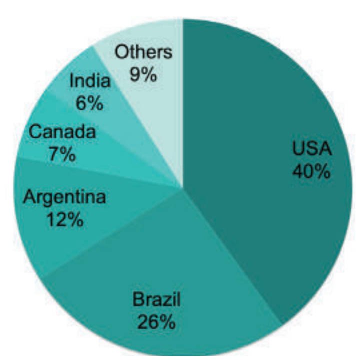
Four Crops



Two Traits



Five Countries



Five countries

Approximately 87% of all GM crops are grown in North and South America.

Just five countries – the US, Brazil, Argentina, Canada and India – grow 91% of all the GE crops in the world. The United States alone accounts for 40% of global GE crops, and Brazil grows another 26%.

Six companies

Six GM seed companies control 58% of the global seed market and 78% of the global pesticide market. The top three – Bayer, Corteva, and Syngenta – control 47% of the global commercial seed market and 52% of the global pesticide market.

The company Bayer (which bought Monsanto) now owns 23% of the global seed market and 16% of the pesticide market.

The companies SinoChem and ChemChina now exist under the umbrella of the Syngenta Group and account for 25% of the global pesticide market.

The new company Corteva (formerly DowDupont) is now the 2nd largest seed company and 4th largest pesticide company in the world. Corteva holds more patents on the genome editing CRISPR technology than any other company or institution in the world.

Sources:
http://www.cban.ca/grocerychainranking
http://www.etcgroup.org/content/food-barons-2022

GM crops and herbicides

Most herbicide tolerant crops in the world are engineered to be tolerant to glyphosate. The widespread and frequent use of certain herbicides, such as glyphosate, has led to some weeds developing herbicide resistance.

Biotechnology companies have responded to the emergence of glyphosate-resistant weeds by developing GM seeds that are tolerant to older, more toxic herbicides such as 2,4-D and dicamba, and by “stacking” multiple herbicide-tolerant traits together in one seed so that the GM crop plant can survive being sprayed by many different herbicides.

Herbicide use increased significantly with the use of GE herbicide-tolerant crops in North America and South America. Pesticide use in soybean production in Brazil increased three-fold between 2000 and 2012 after the introduction of GE (Roundup Ready) soy. Official statistics show rates of glyphosate use increased significantly in both Brazil and Argentina where glyphosate-tolerant soy is 85% and 100% of all soy grown respectively.

(See http://www.stopgetrees.org/global-status-report)

The Canadian Biotechnology Action Network (CBAN) brings together 15 groups across Canada to research, monitor and raise awareness about issues relating to genetic engineering in food and farming. CBAN is a project on the shared platform of MakeWay Charitable Society.

www.cban.ca