



**FIRST REPORT
OF THE
STANDING COMMITTEE
ON
CLIMATE CHANGE AND ENVIRONMENTAL STEWARDSHIP**

First Session
Sixtieth Legislative Assembly
of the
Province of New Brunswick

November 2, 2021

MEMBERS OF THE COMMITTEE

Mr. Hogan, Chair
Ms. Bockus, Vice-Chair
Hon. Mr. Crossman
Hon. Mr. Holland
Hon. Ms. Johnson

Ms. Landry
Mr. LeBlanc
Mr. Mallet
Ms. Mitton
Ms. Conroy

November 2, 2021

To The Honourable
The Legislative Assembly of
The Province of New Brunswick

Mr. Speaker:

I have the pleasure to present herewith the First Report of the Standing Committee on Climate Change and Environmental Stewardship.

The report is the result of your Committee's deliberations on the use of pesticides and herbicides, including glyphosate, in the Province.

On behalf of the Committee, I wish to thank those individuals and organizations who appeared before the Committee or provided written submissions. In addition, I would like to express my appreciation to the members of the Committee for their contribution in carrying out our mandate.

Your Committee begs leave to make a further report.

Respectfully submitted,

Bill Hogan, MLA
Chair

November 2, 2021

To The Honourable
The Legislative Assembly of
The Province of New Brunswick

Mr. Speaker:

Your Standing Committee on Climate Change and Environmental Stewardship begs leave to submit their First Report of the session.

On December 12, 2019, during the Third Session of the 59th Legislative Assembly, all parties in the Legislative Assembly unanimously resolved that the government should refer the issue of glyphosate spraying to a legislative committee to hold public hearings, engage stakeholders, invite submissions, and make recommendations to government; and that a legislative committee dedicated to climate change and environmental stewardship should be created. The Legislative Assembly created the Standing Committee on Climate Change and Environmental Stewardship on December 19, 2019.

On January 16 and February 4, 2020, the Committee met to clarify its mandate, as outlined later in this report, and decided to study the use of pesticides and herbicides, including glyphosate, in the Province. The Committee scheduled departmental briefings and public hearings and invited written submissions.

On February 4-6, 2020, the Committee heard presentations on pesticide and herbicide use from the departments of Environment and Local Government; Natural Resources and Energy Development; and Agriculture, Aquaculture and Fisheries; and from NB Power.

Public hearings on pesticide and herbicide use were scheduled for the week of March 24, 2020; however, they were postponed due to the COVID-19 pandemic.

After the dissolution of the 59th Legislative Assembly and the Committee's reconstitution during the First Session of the 60th Legislative Assembly, the Committee met on March 8 and 11, 2021, and decided, among other things, to resume its study of the use of pesticides and herbicides, including glyphosate, in the Province.

On March 12, 2021, the Committee received an updated presentation from the Department of Agriculture, Aquaculture and Fisheries regarding glyphosate use in New Brunswick agriculture, and posed questions to the Department of Natural Resources and Energy Development regarding herbicide use in forestry.

The Committee held public hearings on June 22-25, September 7, 10, and 21, 2021. The Committee heard 23 presentations, including from conservation groups, forestry and agricultural industry representatives, academics, government agencies, individuals, and Indigenous representatives. The Committee also received 26 written submissions, in the form of emails, letters, and briefs from individuals and organizations in New Brunswick and across Canada.

The Committee met on September 21-23 and October 1 and 27, 2021, to consider the input received during the consultation process and to formulate a report with recommendations to the House.

The Committee wishes to express its appreciation to the presenters who appeared at the public hearings and to those individuals and organizations who provided written submissions.

The mandate adopted by the Committee is set out below. The first section of the summary that follows contains information from the government department and Crown corporation presentations from both 2020 and 2021. The second part is a summary of the input received from members of the public, stakeholders, and subject matter experts on the use of pesticides and herbicides, including glyphosate, in the Province. The report concludes with the Committee's recommendations.

MANDATE OF THE COMMITTEE

The mandate of the Committee, with respect to climate change and environmental stewardship, shall include the following:

- To receive updates from the Department of Environment and Local Government on progress towards the implementation of New Brunswick's Climate Change Action Plan;
- To call on specific departments, agencies, key stakeholders and subject matter experts to provide updates on implementation efforts;
- To gather factual information on climate change, environmental stewardship and any other related issues by engaging with experts and stakeholders in the fields of natural environment and natural resource management;
- To prepare reports with recommendations to the Legislative Assembly.

DEPARTMENTAL AND CROWN CORPORATION PRESENTATIONS

Department of Environment and Local Government

Officials from the Department of Environment and Local Government presented to the Committee regarding New Brunswick pesticide regulations. Pesticides are products that have been designed to manage, destroy, attack or repel pests. Herbicides, including glyphosate, are pesticides for the control of vegetation. Only those pesticides approved for registration by Health Canada's Pest Management Regulatory Agency (PMRA) may be used in the Province. The use of pesticides in New Brunswick is further controlled under the authority of the provincial *Pesticides Control Act* and regulations. The Act requires licensing of vendors and operators, use permits, and applicator certification for non-domestic (e.g., commercial) application of pesticides.

Department of Natural Resources and Energy Development

Officials from the Department of Natural Resources and Energy Development presented to the Committee about forest management, including herbicide use, particularly in New Brunswick's Crown forest. Herbicides are applied to softwood tree plantations on different areas each year

representing 0.5% of the Crown forest to control vegetation that would compete with planted seedlings. The Department views glyphosate use as an important part of forest management. It allows for the growth of more trees for harvesting in a smaller concentrated area. This allows more areas of the forest to be used for other objectives, such as conservation. The officials outlined controls in place around aerial herbicide application in the Crown forest, including planning, permitting, signage requirements, controlled access, GPS guidance, computer-automated controls, and post-operation reporting.

Department of Agriculture, Aquaculture and Fisheries

Officials from the Department of Agriculture, Aquaculture and Fisheries presented to the Committee on the topic of glyphosate use in New Brunswick agriculture. They described glyphosate as the most important and widely used herbicide in New Brunswick agriculture. It is a cost-effective manner of controlling weeds, for which there is no direct replacement. They explained the regulation of the use of glyphosate in New Brunswick agriculture, which requires users to comply with the detailed application instructions approved by Health Canada, and to train and pass an exam to receive an applicator certificate. The officials explained some of the technologies used to apply glyphosate in agriculture. Aerial spraying does not occur. The Department supports the PMRA's rigorous, science-based evaluation and continued approval of glyphosate for use in agriculture.

NB Power

Officials from NB Power presented to the Committee about its Integrated Vegetation Management program to control vegetation underneath the corporation's 28,000 kilometres of transmission and distribution lines. Manual, mechanical, and chemical methods are used to promote desirable, stable, low-growing plants that resist invasion of tall trees. As of 2020, only 28% of vegetation management is done using herbicides. On average, 1,000 to 1,500 hectares are treated. Herbicides are not used in urban areas or on distribution lines. They are applied manually, not by aerial spraying. Several Health Canada-approved herbicides are used, only some of which contain glyphosate. In 2019, no glyphosate-based herbicides were used. When they are applied, a qualified technician from NB Power accompanies the certified applicator, following newspaper advertisements and landowner notification, and after obtaining a use permit from the Department of Environment and Local Government. A report of areas treated and quantity used is provided to the Department.

PUBLIC HEARINGS

Conservation Groups

Representatives from three conservation groups spoke against the continued use of pesticides and herbicides, particularly glyphosate, in the Province. They listed negative impacts on the environment, animals, and human health as causes of concern, and critiqued Health Canada's process for evaluating the safety of these products. Arguing that the long-term outcomes of

exposure to glyphosate-based herbicides are not yet known, they urged legislators and regulators to err on the side of caution when making decisions about their use in the Province.

The issue of how the spray program is funded was also a key concern among conservation groups. According to a public poll, most New Brunswick citizens are concerned about the safety of glyphosate-based herbicides and do not want public funds spent on spraying Crown forests. They urged the Committee to listen to citizens' concerns and act accordingly.

Some conservation groups provided specific recommendations, which included updating the Crown Forest Management Plan and creating a Chief Forester position. The Chief Forester would integrate new science into forest management best practices, work with Indigenous communities to share knowledge, and be accountable for the actions outlined in the plan. They also recommended scaling back clearcutting and amending the *Crown Lands and Forests Act* with ecosystem protection, and fairness to Indigenous peoples as central features.

Conservation groups also addressed Quebec's glyphosate phase-out plan, where the process of banning its use in Crown forests occurred over a period of several years and began with public engagement. They suggested that this could be a model for New Brunswick to follow.

Health Canada

The Pest Management Regulatory Agency (PMRA), a branch of Health Canada, is responsible for pesticide regulation in Canada. Representatives from the PMRA discussed the approval process for pesticides, with emphasis on glyphosate-based herbicides.

The presenters first outlined the benefits of pesticides, including their use in agriculture, industrial processes and public health. However, they said that because such products are toxic, Health Canada governs their use under the legislative authority of the *Pest Control Products Act* and the *Food and Drugs Act*. Provinces have the power to adopt more restrictive, but not less restrictive, pesticide legislation than the federal government.

They explained the process that the PMRA uses when approving any pesticide. PMRA scientists perform a risk assessment of a product based on hundreds and sometimes thousands of scientific studies. They emphasized that this rigorous process ensures that the toxicity of any product approved by the PMRA is well below what would be harmful for humans if it is used according to the product's label.

Regarding the International Agency for Research on Cancer (IARC)'s 2015 classification of glyphosate as a probable carcinogen, they explained that IARC uses a hazard-based assessment system which does not take exposure levels into account, and this eliminates any real-world context.

The presenters said all products are up for review on a 15-year cycle, but this does not prevent them from conducting a special review if new evidence of a risk factor comes forward. They also assured the Committee that they evaluate the ingredients of each product when considering its toxicity. Also, they have specific data requirements for evaluating toxicity – this includes potential

effects on reproduction, neurotoxicity, genotoxicity, developmental effects, and short-term exposure effects at various levels.

PMRA representatives assured the Committee that no registration authority in the world says that glyphosate poses a cancer risk at the current levels at which it is used.

Agricultural Industry

Representatives from agricultural organizations offered their perspectives on the use of pesticides and herbicides, including glyphosate. Three presenters supported the continued use of these products, while one argued against their use.

The presenters discussed how local farms are in decline as the industry favours imported food over Canadian-grown food. Those in favour of the continued use of pesticides and herbicides said that to remain profitable, farmers need to be able to use the best tools available to get the best yield.

Those who favored the continued use of glyphosate-based herbicides said that pesticides are among the most regulated substances in the world and that the PMRA stands firmly behind their safety if used according to the product's label. One presenter also outlined how any New Brunswick farmer first must obtain a pesticide applicator certificate through a comprehensive course and then obtain a permit from the Department of Environment and Local Government to handle a non-domestic pesticide. The presenters emphasized that farmers are motivated to use these products according to the label, not only because the label itself is a legal document, but also because misuse could negatively affect both their own health and crop yields, which would be a costly mistake.

One group gave specific details about the application of glyphosate products in wild blueberry operations. The presenters clarified that in this industry, "swiping" rather than spraying is used, in which case sponges containing the herbicide only touch weeds and this method is not used when any fruit is present. This type of application is performed on a two-year cycle: weed control is done the first year and the crop is harvested the second year.

The group opposed to the continued use of glyphosate-based herbicides in the Province argued that more research needs to be done regarding the role that additives play in increasing the toxicity of glyphosate-based products. They also mentioned that other substances once deemed safe by Health Canada are now banned, so regulators should use caution when approving products whose full effects are not known.

Forestry Industry

Three groups of forestry industry representatives spoke during the Committee's public hearings. They all supported the continued use of pesticides and herbicides, including glyphosate, in the Province.

Two presenters gave an overview of how important lumber and wood products are to New Brunswick's economy. They said New Brunswick is the most forestry-dependent province in Canada with 24,000 people directly or indirectly employed in the sector.

The industry representatives described how vegetation management using glyphosate products is just one component of the overall forest management cycle. This process ensures specific crops are given the best possible conditions to grow quickly and sustainably, and this is particularly critical for the survival of young seedlings.

The presenters clarified that New Brunswick is a national leader in responsible forest renewal and management, with 67% of all harvested areas left to regenerate naturally, without using herbicides. Representatives from one group also clarified that less than 15% of Crown forest is planted today and only 20% will ever be planted over time. In addition, they said softwood and hardwood inventories have remained unchanged over the past 50 years.

They advised the Committee that in New Brunswick, the forestry industry selects the most appropriate, Health Canada-approved herbicides, which are applied using specialized aircraft or forestry tractors. Aircraft used for spraying are equipped with GPS technology that ensures accuracy and enables analysis immediately following application. Sprays containing glyphosate are applied in one location once or twice over 40 years. The Department of Environment and Local Government enforces operational conditions for herbicide use, including setbacks around residential areas and wetlands.

Universities/Research Organizations

The Committee heard from five groups of scientists from universities or federal research organizations. They each discussed a different aspect related to the use of glyphosate-based herbicides, and all focused primarily on their use in the forestry sector. One presenter made a recommendation to discontinue the use of glyphosate-based herbicides; one recommended further study; and the remaining three provided information but did not make specific recommendations about continuation or discontinuation.

One presenter gave an overview of how herbicides work; how they are applied in the forestry sector; and when they are typically used. He said that there is minimal risk when glyphosate sprays are used in forestry, but there is a need to be especially careful around aquatic environments. He pointed to a river monitoring study in New Brunswick that was recently completed (measuring a 2020 application of glyphosate-based herbicide) and found that out of 237 samples, there was one detection of glyphosate in the water and it was very small. He clarified that it is possible to detect glyphosate in very small quantities, and just because it is present does not mean it is a risk to human or animal health.

Presenters from a group that recommended discontinuing the glyphosate-based herbicide spraying program in the New Brunswick forestry sector described how glyphosate blocks amino acids, which are the building blocks of proteins and cells. By doing so, it kills all plants in its pathway, as well as microorganisms. They said that because this process can eliminate plants at the base of the food web, it can negatively affect animal populations. They also said that glyphosate can bind to minerals in soil, which can result in soil depletion. The presenters went on to say that conclusive information about the effects of glyphosate on human health is currently lacking and that the Committee should recognize this as a concern.

The presenter who provided specific recommendations has completed forest ecosystem studies in Oregon and New Brunswick. He presented findings from a study he conducted in Oregon that measured the impact of herbicide spraying on the biodiversity of the forests in test areas. While he found changes to plant life and bird populations, he did not find a major difference on tree yield between treated and control groups. He found similar results in bird population declines in New Brunswick and remarked that there has yet to be a full cost-benefit analysis in the Province that would determine the economic benefits of herbicide use in forestry. He recommended that this be done as soon as possible.

The Committee heard from a group that develops early intervention strategies for controlling spruce budworm populations. The presenters outlined the economic and atmospheric impacts of spruce budworm outbreaks and stressed that early intervention is integral to controlling them. They stressed that their goal is to contain outbreaks, not to completely eradicate the species. The insecticides used to combat spruce budworm outbreaks in New Brunswick have no known level of toxicity to humans and are narrow spectrum, meaning they target the specific biology of caterpillars.

The Committee also heard from aquatic science experts. They discussed how it is important to take water cycles and the hydrological characteristics of the land into account when developing spraying plans and setbacks for aerial pesticide and herbicide application. They also emphasized that it is difficult to measure the direct effects of chemical sprays on various bodies and cycles of water but confirmed that anything added to water over time could have a cumulative effect.

Indigenous Representatives

Organizations speaking on behalf of the Mi'gmaq and Wolastoqey First Nations in New Brunswick, as well as chiefs of individual First Nations communities, and representatives of a traditional Wolastoqey governance organization, spoke during the public hearings. All Indigenous representatives were opposed to the continued use of pesticide and herbicide sprays, including glyphosate.

The Indigenous representatives all said that the land comprising the Province of New Brunswick is their traditional unceded territory. They said that their connection to the land is deep and extends to all the plants and animals that are contained within it. They emphasized that the climate changes that are observable now are due to human activity, and interventions are needed now for future generations to benefit.

Presenters expressed the view that Indigenous perspectives are unique and should be taken into consideration when decisions are made that impact the forest they use for food and medicine. They also said that Indigenous peoples have sophisticated knowledge of the forest as a whole and this knowledge is a valuable and unique resource that should be considered alongside science when making decisions about how forests in New Brunswick are managed.

Many representatives also said that consultation and reconciliation should be actions instead of mere words. One presenter outlined an Indigenous-led framework that is currently in place for the Mi'gmaq community to determine if consent for a project will be granted. This presenter suggested that this framework could be applied to the issue of glyphosate-based herbicide spraying and forestry management practices.

Individuals

Two individuals presented to the Committee. Both opposed the continued use of glyphosate-based herbicides.

One individual, a former deer biologist, focused his presentation on concerns about the PMRA's approval process for pesticides. He emphasized that there is a lack of long-term studies on glyphosate and few that apply to New Brunswick specifically. In addition, he said the Auditor General of Canada revealed areas of concern regarding PMRA's approval process, including not considering the cumulative effects of glyphosate on human health. He went on to discuss his concerns about the impact of glyphosate spraying on deer populations.

The other individual, a hobby farmer, said that it is important for the Committee to take citizens' perspectives into account when making decisions about the use of glyphosate-based products in the Province. She emphasized that New Brunswickers are concerned because such herbicides are used on Crown land, and the spraying program is funded by taxpayers. She said that while the direct hazard of these products may not be obvious now, or backed by specific scientific studies, there have been changes to New Brunswick's forests that citizens like her have observed. She said the Committee should keep consulting the public and look for alternatives to clearcutting and spraying.

WRITTEN SUBMISSIONS

The Committee received 26 written submissions.

The vast majority (21) of the submissions expressed views opposed to the continued use of pesticides and herbicides in the Province, with particular emphasis on glyphosate-based herbicides. Four supported the continued use of these products and one submission, from an individual at a federal research organization, was neutral in opinion, arguing that silviculture practices are neither good nor bad but that more research is needed into alternatives to herbicides in forestry.

Submissions Opposed

Half of the submissions opposed to continued use of glyphosate-based herbicides in the Province reflected an individual opinion, while the other half were sent from individuals representing academic, scientific, or professional organizations.

Three main themes emerge as the primary concerns with the use of pesticides and herbicides in the Province, including glyphosate. These are: 1) negative impact on the environment (forests and waterways, and the animals that dwell in them), 2) negative impact on human health, and 3) criticism of Health Canada's evaluation process.

1. Negative Impact on the Environment

A recurring argument in the written submissions was that glyphosate-based herbicides contribute to biodiversity loss in forests and freshwater ecosystems. Some submissions also argued that this

lack of biodiversity creates changes to diet sources for animals such as deer, birds and fish, which can negatively impact their populations. Others cited recent research that has linked glyphosate-based herbicides to lowered biodiversity of phytoplankton.

2. Negative Impact on Human Health

While some submissions that expressed concern about human health were based on individual opinion, most provided sources. One submission outlined published results regarding the toxic mechanisms of glyphosate and its impact on human health. Another discussed the need to take the different ingredients in glyphosate-based herbicides into consideration when evaluating the safety of such products, as they often contain substances that may be more toxic to humans than the glyphosate itself. A further submission outlined investigations that have linked glyphosate to toxic effects on the microbiome of humans and animals, which could result in chronic health conditions.

3. Criticism of Health Canada's Evaluation Process

Concern over how the PMRA evaluates the safety of glyphosate-based herbicide products figured prominently in many submissions. Criticism of the PMRA focused mainly on the view that the agency does not systematically assemble peer reviewed science but relies on the studies provided by the company that submits a product for approval. Those who expressed concern over this process outlined how these studies could be funded by the chemical companies themselves, and thus be biased toward a favourable outcome. Other criticism of the PMRA included its reliance on studies that are not based in Canada and that are significantly outdated.

Submissions in Support

The four submissions that supported the continued use of pesticides and herbicides in the Province centred around their proven safety and their effectiveness.

One submission argued that in agriculture, glyphosate-based products provide the best results when reducing weed pressure and clearing weeds, and they are the only products that eradicate certain types of invasive species' root systems. Another submission said that if New Brunswick farmers did not have access to the same herbicides as international competitors, they would be unable to compete in the global economy.

The Canadian Army uses glyphosate-based herbicides to manage weeds in training areas. Their submission argued that eliminating unwanted vegetation increases the safety of the training area where heavy artillery and other weapons are used.

Three submissions supported the view that Canada's *Pest Control Products Act* is sound and that the approval process is rigorous. Another said that there is public misconception about the cancer risk of glyphosate products and that the PMRA uses the best available science to make regulatory decisions.

CONCLUSION

The Committee wishes to report the public concern regarding the use of pesticides and herbicides, and particularly glyphosate, in the Province. While Health Canada has recently re-evaluated and approved the continued use of glyphosate based on extensive scientific data, and while federal and provincial regulations already impose rigorous requirements for the use of pesticides in the Province, these public concerns remain. As several presenters pointed out, other pesticides used in the past were thought to be safe at the time, but scientific understanding evolved and eventually judged them unsafe.

Consequently, the Committee recommends a cautious approach toward the use of pesticides, including glyphosate. This should include increased restrictions on spraying, and exploration of alternatives where these exist; more frequent re-evaluation of the safety of glyphosate based on the latest data, including data specific to New Brunswick; and this should also involve provincial agencies that will monitor evolving data and advise government on best practices for safe use of pesticides and proper management of Crown forests. Greater public education and awareness of the regulations that control pesticide use and of the areas where pesticides are applied in New Brunswick are also necessary to address public concerns.

The Committee has identified gaps in the information provided to it on the subject of glyphosate in particular, including evidence regarding its long-term effects on human health and that of wildlife in New Brunswick; perspectives from additional participants in the agricultural sector regarding glyphosate usage and alternatives; and data regarding the costs and benefits of its use in intensive forest management as compared to alternative methods. The Committee therefore wishes to make initial recommendations based on the input it has received to date; however, the Committee emphasizes that it is prepared to revisit this topic in the future and make further recommendations if warranted.

RECOMMENDATIONS

Based on the input received to date, the Committee makes the following initial recommendations:

Pesticides Advisory Board

1. THAT the Minister of Environment and Climate Change re-activate the Pesticides Advisory Board and ensure it remains active.
2. THAT the Minister task the Pesticides Advisory Board with investigating issues and gaps in information regarding the use of pesticides, which includes herbicides, in the Province as identified by the Standing Committee on Climate Change and Environmental Stewardship.
3. THAT, within six months of the tabling of this report, the Minister review the composition of the Pesticides Advisory Board as prescribed in the *Pesticides Control Act* to determine whether any amendments are needed to ensure adequate independent expertise is represented.

Crown Lands and Forests Advisory Board

4. THAT the Crown Lands and Forests Advisory Board be re-activated within six months of the tabling of this report.
5. THAT the Minister of Natural Resources and Energy Development review the composition of the Board to ensure diversity of expertise.
6. THAT the Board ensure stakeholders who use Crown Lands are doing so in a responsible manner to meet stated objectives established by the Minister and/or in legislation.

Forest Management and Ecosystem Protection

7. THAT, for the purpose of evaluating the impact of eliminating herbicide spraying, the government initiate a comprehensive cost-benefit economic study comparing the usage and non-usage of herbicide in managing tree plantations in New Brunswick within 12 months of the tabling of this report.
8. THAT remaining old hardwood, mixedwood, and softwood forest be maintained (not converted). This would require (1) ecologically based forestry, and (2) additional protected natural areas (reserves).
9. THAT the government ensure protected natural areas have connected corridors, where needed, and minimize edge habitat for the purpose of biodiversity.

Increased Restrictions on Spraying

10. THAT setbacks for aerial spraying be increased from 500 metres to 1 kilometre from dwellings.
11. THAT the government require a spraying setback of 100 metres from protected natural areas.
12. THAT the government require a minimum 100-metre aerial spraying setback from water and wetlands and/or require spray plans that may vary depending on the landscape and the hydrological characteristics of the land.
13. THAT the government ban spraying of pesticides in protected watersheds as designated under the *Clean Water Act*.
14. THAT the Minister of Natural Resources and Energy Development request of NB Power that it immediately begin phasing out spraying of pesticides under transmission lines.

Further Monitoring and Research

15. THAT the Legislative Assembly appoint a Legislative Officer charged with the responsibility for Crown Lands and Waters with an appropriate budget beginning in the next fiscal year.

16. THAT the Department of Natural Resources and Energy Development partner with educational institutions and non-governmental organizations, where applicable, to study the effects of spraying pesticides in forestry on wild game, other food and Indigenous medicines in New Brunswick.
17. THAT the government request that Health Canada evaluate the registration of glyphosate every five years and with research conducted in and applicable to New Brunswick.
18. THAT the Department of Environment and Local Government be mandated to routinely sample and test water and sediment for glyphosate and related components adjacent to areas where glyphosate has recently been applied, and to report annually.
19. THAT for the purpose of evaluating the impact of eliminating glyphosate, the government undertake a comprehensive cost-benefit economic study comparing the usage and non-usage of glyphosate in the agricultural sector in New Brunswick within 18 months.

Public Education and Awareness

20. THAT, within six months of the tabling of this report, the Department of Natural Resources and Energy Development create a public dashboard regarding all aspects of Crown forest utilization, including pesticide spraying, for the purpose of increasing public education and awareness.

**APPENDIX A:
PUBLIC HEARING PARTICIPANTS**

Agricultural Alliance of New Brunswick

Atlantic Forestry Centre, Canadian Forest Service, Natural Resources Canada

Betts, Matthew G., Ph.D., Professor, College of Forestry, Oregon State University

Bleuets NB Blueberries

Canadian Rivers Institute, University of New Brunswick

Conservation Council of New Brunswick

CropLife Canada

Cumberland, Rod

Department of Chemistry and Biochemistry, Université de Moncton

Eel Ground First Nation

Forest NB

Forest Protection Limited

Fort Folly First Nation

Geest, Moranda van

Groupe ÉcoVie

J.D. Irving, Limited

Mi'gmawe'l Tplu'taqnn Incorporated

National Farmers Union in New Brunswick

Pabineau First Nation

Pest Management Regulatory Agency, Health Canada

Stop Spraying NB

Wolastoq Grand Council

Wolastoqey Nation in New Brunswick

**APPENDIX B:
WRITTEN SUBMISSIONS**

Boudreau, Isabelle

Canadian Army, 5th Canadian Division Support Base Gagetown

Canadian Cancer Society

Centre for Health Science and Law

Citizens Group for the Safeguarding of Deer and its Habitat in the Edmundston Region

Daigle, Yvon

Ecohealth Research Collective on Pesticides, Policies and Alternatives (CREPPA), Université du Québec à Montréal

Fleming, Melanie

McIntosh, Charlie

New Brunswick Lung Association

Pest Management Regulatory Agency,
Health Canada

Prevent Cancer Now

Richard, Roberte

Safe Food Matters Inc.

Savidge, Rodney, Ph.D.

Scott, Evelyn

Seneff, Stephanie, Ph.D.

Steeves, Greg

Steeves, Janet

Stop the Spray BC

Stop the Spray Ontario

Syngenta Canada Inc.

Thiffault, Nelson, ing.f., Ph.D.

Vrain, Thierry, Ph.D.

Ward, David

Webber, Charles