CAPE
Canadian Association of Physicians for the Environment
Association Canadienne des Médecins pour l'Environnement
ACME

Submitted via email

Pest Management Regulatory Agency Publications Section
Pest Management Regulatory Agency (PMRA)
Health Canada
2720 Riverside Drive
Ottawa, Ontario
K1A 0K9

E-mail: hc.pmra.publications-arla.sc@canada.ca

July 20, 2021

Re: Proposed Maximum Residue Limit PMRL2021-10, Glyphosate

The Canadian Association of Physicians for the Environment (CAPE-ACME) welcomes the opportunity to provide a response to the Proposed Maximum Residue Limit PMRL2021-10, Glyphosate. Please accept the following comments and related references in keeping with the consultation process.

CAPE-ACME is a national physician-led organization working at the intersection of health and environment. As physicians with a record of research and advocacy around evidence-based concerns relating to critical environmental health issues in Canada, CAPE recommends serious consideration of a number of factors with regard to the proposed maximum residue limits (MRLs) on glyphosate. This change would affect several foods regularly consumed by Canadians, including oats, wheat, barley, beans, lentils, peas and tree nuts.

The scientific literature of health impacts and recognition of differential and disproportionate impacts of glyphosate by individuals and populations, including those made more vulnerable by both biological and social conditions, are crucial in the assessment of risks associated with glyphosate exposures.

In particular, we wish to highlight adverse health outcomes - both known and suspected - associated with glyphosate. Importantly, where there are gaps in the literature but where health impacts are suspected, we also compel the application of the precautionary principle. While this comment document does not address the full scope of the literature nor of all concerns related to glyphosate levels and associated health effects, it does outline critical elements that should bring into question the allowance of glyphosate use and specifically the allowable limits of residues.

Glyphosate, first sold in 1974, has since become the most commonly and intensively used herbicide worldwide. The widespread application of glyphosate and GBH to crops has spurred the spread of tolerant and resistant weeds in the US, and worldwide, which in turn has created the need for more frequent applications at higher concentrations.[1]

Glyphosate is the most widely used herbicide in Canada. It is sprayed on major staple food crops including corn, soy, canola, wheat, oats and barley. Glyphosate is found in our waterways, drinking water, and about one third of our food products.

Gaps, flaws and weaknesses have been noted in Health Canada's system of pesticide regulation that undermine confidence in pesticide registration decisions. Missing data, inadequate attention to epidemiological studies, lack of evidence on cumulative exposures, failure to consider the effect of additives that intensify toxic effects, delays in re-evaluating older pesticides, and lack of transparency have led physicians to suggest that the system is "not reliably health-protective".[2] Canadians must be assured of protection from glyphosate risks by government and Health Canada decisions based on credible, independent science, not through an interest in glyphosate's performance on the market.[3]

Exposure to glyphosate can occur through various routes including in food and drinking water, in the air we breathe, and in occupational and environmental settings.[4] During and after spraying is of particular concern.[5] Glyphosate levels are measurable in human beings. Of concern, there are no occupational exposure limits for glyphosate in Canada or any other international jurisdiction.[6] The toxic effects on human health may persist for many generations and therefore use must be scrutinized against costs to current and future human health and environmental effects.[7]

The International Agency for Research on Cancer (IARC) has classified glyphosate as "probably carcinogenic to humans."[8] IARC concludes from "strong evidence" that glyphosate exposure is genotoxic through mechanisms known to be associated with human carcinogens (DNA damage, oxidative stress). IARC considered a total of 118 genotoxicity assays, analyzed another 81 assays exploring other possible genotoxic mechanisms and placed considerable weight on studies in exposed human populations. IARC' assessment relied on peer-reviewed studies of which 70% were positive for genotoxicity, encompassing data from typical dietary, occupational, and elevated

---

[1] https://ehjournal.biomedcentral.com/articles/10.1186/s12940-018-0435-5#ref-CR1

[2]https://edmontonjournal.com/opinion/columnists/opinion-children-face-health-risks-from-non-essential-use-of-pesticide

[3]https://cape.ca/wp-content/uploads/2019/01/News-Release-Health-Canada-rejects-glyphosate-concerns-January-2019.pdf

[4] Office of Chemical Safety And Pollution Prevention. Glyphosate. Dietary exposure analysis in support of registration review. In. Washington, DC: United States Environmental Protection Agency; 2017. p. 1–20.

[5]Mesnage, R., Moesch, C., Grand, R., Lauthier, G., Vendômois, J., Gress, S., & Séralini, G. (2012). Glyphosate exposure in a farmer's family. J Environ Prot, 3(9), 1001.

[6] https://www.carexcanada.ca/profile/glyphosate/

[7]https://www.healthandenvironment.org/environmental-health/environmental-risks/chemical-environment-overview/pesticides

[8] https://www.iarc.who.int/featured-news/media-centre-iarc-news-glyphosate/

exposure scenarios.[9] A growing number of studies associate exposure to glyphosate with an increased risk of non-Hodgkin lymphoma.[10]

The proposed maximum residue limits stem from the FAO/WHO a report[11], using data that fails to consider a full scope of dietary considerations beyond soybeans, nor the existing climate conditions that might influence application volumes and conditions.

Children are particularly vulnerable to glyphosate. Glyphosate in oats and bran in cereals marketed as for children are already at levels of concern for their health.[12] An increase in allowable glyphosate residue levels increases these health concerns. Children consuming grain as recommended in the Canada Food Guide[13], and in particular people whose diets are predominantly plant based, vegetarian or vegan and for those whose food comes from “conventionally” grown (i.e. not organic) legumes and nuts, are at risk of consuming more glyphosate under the proposed increased limits. It therefore appears urgent to us to quickly clarify the possibly increased risk for people having a diet rich in legumes and other food products with a high residue of glyphosate.[14]

Women exposed to herbicides during pregnancy in areas where glyphosate (Roundup Ready) soy is heavily grown gave birth to children with higher levels of malformations[15], including craniofacial defects, small head circumference, more or less fingers, cleft palate and congenital heart defects compared to controls.[16] Higher incidence of attention deficit hyperactive disorder in children of applicators of glyphosate has also been documented in the scientific literature.[17] In a study of farmers in the Ontario region, a fertility decrease of 20% was associated with female exposure to glyphosate based herbicides.[18] Other Ontario based research found an increased incidence of breast cancer among women who lived or worked on farms, and parallel qualitative research noted glyphosate use.[19]

Endocrine disruption was excluded from the PMRA in the 2017 assessment. Yet the most recent scientific knowledge shows that glyphosate has eight of the ten characteristics specific to endocrine disruptors and that new prospective studies of

---

[9] https://enveurope.springeropen.com/articles/10.1186/s12302-018-0184-7

[10] https://www.sciencedirect.com/science/article/abs/pii/S1383574218300887

[11] https://www.who.int/foodsafety/areas_work/chemical-risks/2019-extra-jmpr-report.pdf

[12]https://www.ewg.org/childrenshealth/monsanto-weedkiller-still-contaminates-foods-marketed-to-children?utm_source=getresponse&utm_medium=email&utm_campaign=meg&utm_content=Corrected%20%E2%80%93%20Health%20Canada%20Proposes%20to%20Increase%20Glyphosate%20in%20Food%20~%20Have%20Your%20Say%21

[13] https://food-guide.canada.ca/en/

[14] https://pubmed.ncbi.nlm.nih.gov/32267686/

[15] http://scielo.iics.una.py/scielo.php?script=sci_arttext&pid=S1683-98032007000200002

[16]https://www.telegraph.co.uk/news/science/science-news/8518048/GM-soy-the-high-cost-of-the-quest-for-green-gold.html

[17] Garry, V. F., Harkins, M. E., Erickson, L. L., Long-Simpson, L. K., Holland, S. E., & Burroughs, B. L. (2002). Birth defects, season of conception, and sex of children born to herbicide applicators living in the Red River Valley of Minnesota, USA. Environmental health perspectives, 110(Suppl 3), 441.

[18] Curtis, K. M., Savitz, D. A., Weinberg, C. R., & Arbuckle, T. E. (1999). The effect of herbicide exposure on time to pregnancy. Epidemiology, 112-117.

[19] https://pubmed.ncbi.nlm.nih.gov/23164221/

cohort would be necessary to obtain a more accurate assessment of the real risks incurred by human populations[20]. Current data suggest an association between exposure to glyphosate and the risk of birth defects, miscarriages and reduced fertility.[21]

Glyphosate could negatively affect bacteria that colonize the human digestive system by inhibiting cytochrome P450 enzymes. Since these enzymes perform important roles in the balance of some of the human body's systems, this interference could cause major human health problems, including gastrointestinal problems, diabetes, obesity, etc. heart disease, depression, autism, and types of cancer.[22]

CAPE expresses concern that these health risks are not part of the evaluation used in consideration of the proposed maximum residue limits.

While the health risks evidenced in the scientific literature should be reason enough for pause in extending glyphosate limits, the suspected health concerns - including suggested endocrine disrupting potential[23] - should add weight to the argument that lowering limits - and even arguably a ban on its use - through the application of the precautionary principle is the sound public health approach.

Environmental health advocates have long argued for the application of the precautionary principle in the face of threats to human health stemming from exposure to pollution and toxins. The precautionary principle states that “when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.”[24]

Given the known and suspected health risks associated with glyphosate, and in consideration of a proposed increase in limits, caution is warranted, and the precautionary principle should guide the decisions against an increase. “The precautionary principle is meant to represent the public good in all decisions made under scientific uncertainty. When there is substantial scientific uncertainty about the risks and benefits of a proposed activity, policy decisions should be made to err on the side of caution with respect to the environment and the health of the public”.[25]

CAPE is seriously concerned about the potential risks associated with increased exposure to glyphosate, which would result from increased MRLs. In this sense, the organization wishes to propose a short series of recommendations to Health Canada in order to protect human health:

1. take a precautionary approach with regard to MRLs on glyphosate;
2. modify the assessment requirements for glyphosate to incorporate a comprehensive assessment of the impacts of exposures, including cumulative impacts, specific windows of vulnerability for populations at risk (including

[20]https://www.sciencedirect.com/science/article/abs/pii/S0045653520328149
[21] https://www.figo.org/removal-glyphosate-global-usage
[22] https://www.mdpi.com/1099-4300/15/4/1416
[23] https://www.sciencedirect.com/science/article/abs/pii/S0045653520328149
[24] https://ehp.niehs.nih.gov/doi/10.1289/ehp.01109871
[25] https://ehp.niehs.nih.gov/doi/10.1289/ehp.01109871

pregnant women, children, and workers), and multiple routes of exposure (water, air, diet);

3. reassess the human health impacts of increased exposure to glyphosate against the standards proposed in 2021, standards that are two to three times higher than those used in the 2017 assessment;
4. commission independent studies to fill the gaps in the characterization of the risks to human health associated with increased consumption of glyphosate;
5. commission independent studies on chronic exposure to glyphosate, as an active agent and in its commercial formulation, in order to take into account the possible additive impact of the co-agents that the commercial formulation contains;
6. and to clarify the potential of glyphosate as an endocrine disruptor through new independent scientific studies conducted on prospective cohorts

Consistent with prior reports[26] and submissions[27] by CAPE on the known and suspected environmental health impacts associated with glyphosate, we strongly urge you to conduct a fulsome investigation of adverse health impacts in the risk assessment process related to the proposed increased limits of glyphosate residues.

We look forward to seeing the government follow through in assessing the substantial risks posed to health and the environment by glyphosate. We support the government in its efforts to protect people and the environment from toxic chemicals.

Signed,

Dr. Claudel Pétrin-Desrosiers, MD
Board member, CAPE

Dr. Anjali Helferty, PhD
Executive Director, CAPE-ACME

Dr. Jane E. McArthur, PhD
Toxics Campaign Director, CAPE-ACME

[26] https://cape.ca/wp-content/uploads/2018/10/Backgrounder-Glyphosate-5-sept-2018.pdf

[27] https://cape.ca/wp-content/uploads/2018/03/1.Letter-to-Minister-Philpott-re-Final-Notice-of-Objection-to-Glyphosate-Re-evaluation-Decision-July-2017.pdf