

George Eustice MP
Minister of State for Agriculture, Fisheries and Food
DEFRA
Nobel House,
17 Smith Square,
Westminster
London,
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15th August 2019

Dear Minister,

We are writing to you to express our concerns over the current re-approval procedure of the organophosphate insecticides chlorpyrifos-ethyl and chlorpyrifos-methyl and ask you to support a non-renewal for both substances. At the time of writing, the European Food Safety Authority (EFSA)'s peer-review of the risk assessment report is overdue. This not only means that there is a serious risk that the deadline set for the renewal of both insecticides (31st January 2020) will be missed, but also that these hazardous substances, which are known neurodevelopmental toxicants and endocrine disrupting chemicals (EDCs) could be tolerated on the European market for yet another year.

Breast Cancer UK is dedicated to the prevention of breast cancer, by tackling the environmental and behavioural risk factors associated with the disease, including exposures to carcinogenic and endocrine disrupting chemicals which include chlorpyrifos-ethyl (herein referred to as chlorpyrifos) and chlorpyrifos-methyl¹.

There is a strong body of independent scientific evidence that links exposure to chlorpyrifos at low, environmentally relevant concentrations, to neurodevelopmental disorders among children². Although chlorpyrifos-methyl is less well documented, it has a similar mechanism of action and is likely to have similar toxicity. Chlorpyrifos and chlorpyrifos-methyl are classified as an acetyl cholinesterase inhibitors and neurotoxicants³. Beyond neurotoxicity, chlorpyrifos may also be associated with cancers, metabolic disturbances and male infertility. Both forms of chlorpyrifos are EDCs which affect a number of hormones including thyroid. Chlorpyrifos has been shown to disrupt oestrogen⁴.

We at Breast Cancer UK are especially concerned that exposure to chlorpyrifos may increase breast cancer risk. Chlorpyrifos can act as a potential disruptor of oestrogen *in vivo*⁵ and *in vitro*⁶, altering levels of circulating and bioavailable sex hormones, including oestrogen. Elevated levels of oestrogen are known to increase breast cancer risk; similarly, chemicals which mimic or interfere with oestrogen and oestrogen pathways may also enhance risk⁷. Chlorpyrifos alters mammary gland

¹ TEDX (2019). The Endocrine Disruption Exchange. <https://endocrinedisruption.org/interactive-tools/tedx-list-of-potential-endocrine-disruptors/search-the-tedx-list#sname=chlorpyrifos&searchfor=any&sortby=chemname&action=search&searchcats=all&sortby=chemname> (Accessed August 14th, 2019)

² Bellanger, M. et al. (2015). Neurobehavioral Deficits, Diseases, and Associated Costs of Exposure to Endocrine Disrupting Chemicals in the European Union. *Journal of Clinical Endocrinology and Metabolism* 100(4): 1256–1266. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4399309/>

³ PPBD database (2019). Pesticide Properties Database. University of Hertfordshire <https://sitem.herts.ac.uk/aeru/ppdb/en/Reports/155.htm>

⁴ Kojima H. et al. (2004). Screening for estrogen and androgen receptor activities in 200 pesticides by in vitro reporter gene assays using Chinese hamster ovary cells. *Environmental Health Perspectives* 112(5): 524-531. <https://www.ncbi.nlm.nih.gov/pubmed/15064155>

⁵ Ventura, C. et al. (2016). Pesticide chlorpyrifos acts as an endocrine disruptor in adult rats causing changes in mammary gland and hormonal balance. *Journal of Steroid Biochemistry & Molecular Biology* 156: 1-9. <https://www.ncbi.nlm.nih.gov/pubmed/26518068>

⁶ Ventura, C. et al. (2012). Differential mechanisms of action are involved in chlorpyrifos effects in estrogen-dependent or -independent breast cancer cells exposed to low or high concentrations of the pesticide. *Toxicological Letters* 213(2): 184-93. <https://www.ncbi.nlm.nih.gov/pubmed/22771950>

⁷ Diamanti-Kandarakis, E. et al. (2009). Endocrine-disrupting chemicals: An Endocrine Society scientific statement. *Endocrine Reviews*, 30(4): 293–342. <http://www.ncbi.nlm.nih.gov/pubmed/19502515>

development and promotes mammary tumour development in rodents⁸ and epidemiological studies⁹ suggest environmental exposure to chlorpyrifos may increase breast cancer risk in women. Furthermore, *in vitro* studies show chlorpyrifos induces breast cell proliferation and oxidative stress, and genotoxicity¹⁰, which may also contribute to increased cancer risk.

Chlorpyrifos is highly toxic to mammals and is classified as a reproductive toxicant. Chlorpyrifos and chlorpyrifos-methyl are skin irritants and sensitisers. They are highly toxic to fish, aquatic invertebrates and honey bees and moderately toxic to birds, aquatic plants, algae and earthworms.

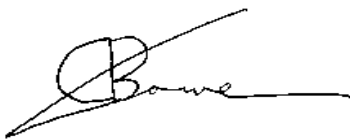
Independent re-evaluation of the data¹¹ has shown severe flaws in the last approval processes of chlorpyrifos and chlorpyrifos-methyl.

According to EU official monitoring data, chlorpyrifos is common in fruits sold on the EU market, including the UK, irrespective of the status of national authorisations^{12 13}. Banning both chlorpyrifos and chlorpyrifos-methyl provides a Europe-wide opportunity for health and would prevent potential regrettable substitution of the former by the latter.

Support exists for such a ban. Over 212,700 people have already signed a petition launched by SumOfUs, the Health and Environment Alliance (to which Breast Cancer UK belongs), Générations Futures, Ecologistas en Acción, and the European and German branches of the Pesticide Action Network¹⁴.

The European Commission has publicly indicated that it is considering drafting a non-renewal proposal for chlorpyrifos, and possibly for chlorpyrifos-methyl. Earlier this month the European Food Safety Agency (EFSA) acknowledged in a public statement that chlorpyrifos is harmful to human health and does not meet the criteria for renewal on the European market¹⁵. We urge you to back the ban of both substances and oppose any extension of the current approval.

Yours sincerely,



Kit Bowerin

Public Affairs Officer

⁸ Ventura, C. et al. (2019). Effects of the pesticide chlorpyrifos on breast cancer disease. Implication of epigenetic mechanisms. *Journal of Steroid Biochemistry & Molecular Biology* 186: 96-104. <https://www.ncbi.nlm.nih.gov/pubmed/30290214>

⁹ Engel, L. S. et al. (2017). Insecticide Use and Breast Cancer Risk among Farmers' Wives in the Agricultural Health Study. *Environmental Health Perspectives* 125(9). <https://ehp.niehs.nih.gov/doi/pdf/10.1289/EHP1295>

¹⁰ Mužinić et al. (2019). Chromosome Missegregation and Aneuploidy Induction in Human Peripheral Blood Lymphocytes *In vitro* by Low Concentrations of Chlorpyrifos, Imidacloprid and α -Cypermethrin. *Environmental & Molecular Mutagenesis* 60(1):72-84. <https://www.ncbi.nlm.nih.gov/pubmed/30264469>

¹¹ Mie, A. et al. (2018). Safety of Safety Evaluation of Pesticides: developmental neurotoxicity of chlorpyrifos and chlorpyrifos-methyl *Environmental Health*. 17(1): 77. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6238321/pdf/12940_2018_Article_421.pdf

¹² Chlorpyrifos residues in fruits, the case for a EU-wide ban to protect consumers, published June 2019 by the Health and Environment Alliance (HEAL) and Pesticide Action Network Europe. https://www.env-health.org/wp-content/uploads/2019/06/June-2019-PAN-HEAL-Briefing-chlorpyrifos_web.pdf (Accessed August 14th, 2019).

¹³ UK Department for Environment, Food and Rural Affairs (2019). Pesticide residues in food (updated August 14th, 2019). <https://data.gov.uk/dataset/5d5028ef-9918-4ab7-8755-81f3ad06f308/pesticide-residues-in-food> (Accessed August 14th, 2019).

¹⁴ SumOfUs petition: No more toxic chlorpyrifos in our food: <https://actions.sumofus.org/a/chlorpyrifos> (Accessed August 14th, 2019).

¹⁵ EFSA statement (2019) 'Chlorpyrifos: assessment identifies human health effects' <https://www.efsa.europa.eu/en/press/news/chlorpyrifos-assessment-identifies-human-health-effects> (Accessed August 14th, 2019)