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Comments from the Saskatchewan Environmental Society on the Proposed Pest Management Regulatory Agency Re-Evaluation Decision for Imidacloprid

Dear Health Canada Pest Management Regulatory Agency Staff,

We are writing on behalf of the Saskatchewan Environmental Society to strongly support the Pest Management Regulatory Agency's proposal to phase-out all the agricultural uses of imidacloprid, as well as a majority of this neonicotinoid's other outdoor uses.

In our judgment, imidacloprid poses a significant risk to Canada's environment.

We recognize that the impacts of imidacloprid on bees and other pollinators is being reevaluated in a separate pollinator risk assessment, so we will not touch on the risks to pollinators from imidacloprid exposure in these comments.

The Saskatchewan Environmental Society agrees with the 'risks of concern' associated with the use of imidacloprid that PMRA has identified for both aquatic and terrestrial environments.

Here we offer some observations on the scientific literature and on our concerns about the continued use of imidacloprid in a Saskatchewan context.

Imidacloprid was the first neonicotinoid launched in the global marketplace. It had low acute toxicity to the standard aquatic species used in regulatory testing of chemicals, namely the waterflea *Daphnia magna*. It thus appeared at first that imidacloprid would have a low impact on aquatic systems. However, research over the past decade



has revealed that many other aquatic species are far more negatively impacted by imidacloprid than *Daphnia magna*.¹ In fact, sensitivities can differ by several orders of magnitude. In the judgment of the Saskatchewan Environmental Society, the negative impacts of imidacloprid on aquatic ecosystems were underestimated during the initial licensing process.

Common uses of imidacloprid in Saskatchewan are its application as a coated seed in the planting of canola and wheat. In Saskatchewan, thousands of acres of canola are planted annually, much more than in eastern provinces such as Ontario or Quebec, and our understanding is that it is currently not an option for producers to purchase untreated canola. It is now well established that the vast majority of the insecticide in coated seeds remains in the soil at the end of the cropping season.² Imidacloprid, like other neonicotinoids, is water soluble. Given these factors, imidacloprid has very high potential to move beyond the treated area and run into soil and aquatic habitats. It can run off fields during storm events or can move into ground water. It has a high index rating for groundwater leaching.³ Wild plants growing in agricultural field margins can take up the insecticide, and downstream aquatic organisms and inhabitants of riparian zones can be negatively affected.

In Saskatchewan, one or more neonicotinoids are now being regularly detected in prairie wetlands located in fields of canola, soybeans, oats, wheat and barley.⁴ This is a worrisome trend.

'Mean concentrations' of imidacloprid in water samples taken during the summer months from wetlands that drain wheat fields in Saskatchewan are far in excess of the concentrations known to have negative effects on aquatic life and on birds. So too, are 'maximum concentrations' of imidacloprid in water samples taken from wetlands that drain canola fields.⁵ Moreover, when average concentrations of several neonicotinoids combined are considered, the results are even more troubling.

Evidence in the United States is beginning to capture the scale at which aquatic organisms can be impacted by imidacloprid. Surveys in Maryland suggest up to 40 per cent of aquatic species are seriously affected in streams, where average residue levels of imidacloprid are 5.4 parts per billion

¹ "Contamination of the Aquatic Environment with Neonicotinoids and its Implication for Ecosystems", Francisco Sanchez-Bayol, Koichi Goka and Daisuke Hayasaka, *Front. Environ. Sci.*, November 2, 2016.

² "Pesticides linked to bird declines", Dave Goulson, *Nature: The International Weekly Journal of Science*, July 17, 2014, p. 295. Refer to Figure 1 titled: The environmental fate of neonicotinoids. The description with the diagram notes: "When neonicotinoids are applied as a seed dressing to crops, the bulk of the active ingredients (80-98%) enter the soil and soil water." And "Contamination of the Aquatic Environment with Neonicotinoids and its Implication for Ecosystems", *ibid*, November 2, 2016.

³ "The Environmental Fate of Imidacloprid", Scott Wagner, Environmental Monitoring Branch, Department of Pesticide Regulation, Sacramento, California available at: http://www.cdpr.ca.gov/docs/emon/pubs/fatememo/Imidacloprid_2016.pdf. Wagner states that Imidacloprid has a Groundwater Ubiquity Score leaching potential index of 3.76.

⁴ "Widespread Use and Frequent Detection of Neonicotinoid Insecticides in Wetlands of Canada's Prairie Pothole Region", Anson Main, John Headley, Kerry Peru, Nicole Michel, Allan Cessna and Christy Morrissey, *PLOS*, March 26, 2014. doi: 10.1371/journal.pone.0092821

⁵ *Ibid*. Refer to Table 2 titled: Summary of detections, arithmetic means and maximum concentrations of total neonicotinoids and active ingredients in water from Prairie wetlands of central Saskatchewan (2012-2013). The mean concentration of imidacloprid in wetlands that drain wheat fields in the summer of 2012 is listed as 15.9 ng/L, while the maximum concentration recorded was 256 ng/L. In the case of wetlands that drain canola fields, the mean for imidacloprid in the same period was 1.8 ng/L and the maximum was 67.9 ng/L.



(and can be as high as 131 parts per billion). A second example is provided by three farming valleys in California, where imidacloprid is currently impacting up to 11 per cent of aquatic species.⁶

Evidence in Europe suggests that when imidacloprid is present in surface waters at concentrations of 20 parts per billion or more, insect eating birds suffer. For example, at these concentrations for imidacloprid, a Dutch study found a decline in bird populations averaging 3.5 per cent per year.⁷ This decline appeared only after imidacloprid was introduced in the Netherlands in 1994. The authors note: "local population trends were significantly more negative in areas with higher surface-water concentrations of imidacloprid."

The findings of the Dutch study are worrisome in a Saskatchewan context, since Saskatchewan wetlands provide important habitat for large numbers of water birds.

Another major concern for the Saskatchewan Environmental Society is the mounting evidence from around the world that the negative impacts of imidacloprid and other neonicotinoids cascade through ecosystems, weakening their stability. Research has demonstrated that important soil and freshwater functions can be disrupted, including litter break down, nutrient cycling, biological pest control and pollination services.⁸

Given that imidacloprid is regularly applied on the Canadian prairies, and given international scientific research findings, there is every reason to be very concerned that the continued application of imidacloprid in prairie agriculture and in many other outdoor settings has the potential to weaken the stability of prairie ecosystems. This is a risk that is simply not worth taking.

The Saskatchewan Environmental Society is therefore of the view that the proposed PMRA re-evaluation decision for imidacloprid is fully justified on the basis of the scientific literature and the concentrations of the insecticide being found in Canada's terrestrial and aquatic environment.

We want to commend Health Canada's Pest Management Regulatory Agency for its work on this file and urge that the phase out of imidacloprid for the applications PMRA has identified be completed within the next three years. We would also like to recommend that PMRA move promptly to assess the sustainability of other neonicotinoids, since in our judgement several other neonicotinoids also pose significant risks to the prairie environment. Clothianidin and thiamethoxam are two examples of other neonicotinoid compounds that are structurally similar to imidacloprid and are regularly showing up in Saskatchewan wetlands. Clothianidin and thiamethoxam have quite long half lives in soil, leading to environmental persistence and high potential for movement into surface waters. These two neonicotinoids are more widely applied in Saskatchewan than imidacloprid, and thus their potential damage to the environment is even greater. The Saskatchewan Environmental Society is particularly concerned about the negative combined cumulative effects of imidacloprid, clothianidin, thiamethoxam and other neonicotinoids on the Saskatchewan and Canadian environment.

⁶ "Contamination of the Aquatic Environment with Neonicotinoids and its Implication for Ecosystems", *ibid*, November 2, 2016. The authors cite: Johnson and Pettis, 2014 and Stamer and Goh, 2012.

⁷ "Declines in insectivorous birds are associated with high neonicotinoid concentrations", Caspar Hallmann, Ruud Foppen, Chris van Turnhout, Hans de Kroon and Eelke Jongejans, *Nature: The International Weekly Journal of Science*, July 17, 2014, p. 341.

⁸ "Conclusions of the Worldwide Integrated Assessment on the risks of neonicotinoids and fipronil to biodiversity and ecosystem functioning" J.P. van der Sluijs et al., *Environ Sci Pollut Res*, June 2014, DOI a0.1007/s11356-014-3229-5



These considerations are also relevant to your government's commitment to address the threat of climate change. As the effects of imidacloprid and other neonicotinoids cascade through ecosystems, our natural environment becomes less resilient to the additional pressures it will face under climate change and extreme weather events.

Thank you for considering our submission. We would be grateful if you could confirm receipt of our submission and provide us with an update when a final Health Canada PMRA decision is made.

Yours sincerely,

A handwritten signature in black ink that reads "Peter Prebble".

Peter Prebble, Board Member

A handwritten signature in blue ink that reads "Murray Hidlebaugh".

Murray Hidlebaugh, Board Member

A handwritten signature in blue ink that reads "Hayley Carlson".

Hayley Carlson, Policy Coordinator

The Saskatchewan Environmental Society (SES) is a non-profit, registered charity that is committed to supporting sustainable living and sustainable resource use in Saskatchewan. We work with, and on behalf of, communities, organizations, businesses and policy makers to encourage informed decision-making that moves us towards sustainability. SES's current action areas include sustainable energy and climate solutions, water protection, resource conservation, biodiversity preservation, and reduction of toxic substances.