Friends of Merrymeeting Bay

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Testimony in Support of LD 1323

An Act to Prohibit the Use of Neonicotinoid Pesticides and the Use and Sale of Neonicotinoid-treated Seeds

Ed Friedman, Chair, Friends of Merrymeeting Bay (FOMB) 4/12/25 before the Agriculture, Conservation & Forestry Committee

Senator Rachel Talbot Ross, Rep. Bill Pluecker & members of the ACF Committee,

I'm Ed Friedman, chairman of Friends of Merrymeeting Bay writing in support of LD 1323 because of the widespread known adverse effects of neonicotinoid insecticides on the environment. I also submit these comments as a longtime small vegetable farmer, manufacturer of a food product and apiarist of over 30 years.

The American Bird Conservancy (ABC) designated Merrymeeting Bay as a Globally Important Bird Area in recognition of its value to the conservation of birds and their habitats. The Bay is part of an international network of key sites designated as such in an effort to further global bird conservation. Most of these places are exceptionally important - even essential - for bird conservation. But birds are just one part of our complex food web. By definition, this web or chain is affected throughout by adverse impacts to the base, whether through increasing levels of biologically active anthropogenic radiofrequency radiation from wireless technology, interruption of valuable nutrient flows through soil depletion and damming of rivers or in this case pesticide use and in particular neonicotinoids.

Neonicotinoids are a class of insecticides that damage the central nervous system of insects, causing tremors, paralysis, and death at very low doses. The primary neonicotinoids registered for use in the U.S. are six relatively new (within the last 20 years) active ingredients: acetamiprid, clothianidin, dinotefuran, imidacloprid, thiacloprid, and thiamethoxam. All are "systemic," meaning they are absorbed into treated plants and distributed in their vascular systems with water that moves up through the plant. Treating a plant or just coating a seed with neonicotinoids can render parts of the plant—including the roots, leaves, stems, flowers, nectar, pollen, and guttation fluid—toxic to insects. The toxicity of the plant varies over time depending on the part of the plant, the amount of neonicotinoid applied, and other factors. Neonicotinoids are persistent in soil and easily transported via air, dust and water to habitats in or near crop fields. There, they can kill or weaken beneficial invertebrates, as well as birds and other wildlife, through direct and indirect effects. Sublethal doses can result in honey bee (Apis mellifera) colony damage through chronic effects, including compromising the behavior, health, and immunity of colonies, thus causing them to collapse due to pathogens and parasites. Neonic doses can result in honey bee (Apis mellifera) colony damage through chronic effects, including compromising the behavior, health, and immunity of colonies, thus causing them to collapse due to pathogens and parasites.[i]

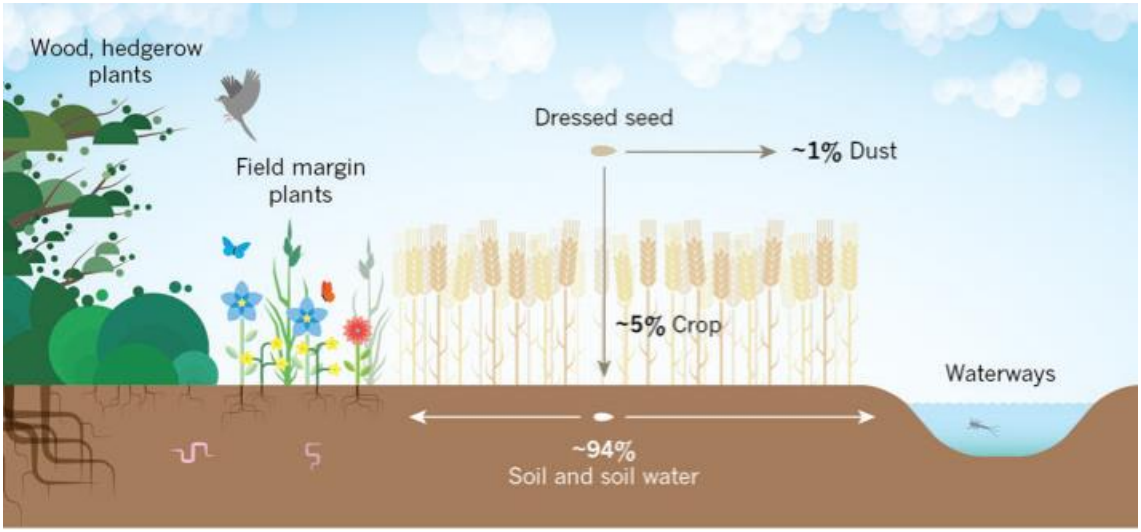
LD 1323 is important because it supplements Maine law passed in 2021 that while limiting some neonic uses, neglected to regulate their use as seed treatments or coatings. Will eliminating neonic seed coatings diminish yields? The European Union banned most uses of neonics ten years ago. New York, Vermont, Quebec and

Ontario have done this as well. In Quebec, farmers had an option to continue use of treated seed if they got a "prescription" of need from a licensed agronomist. It was found most farmers didn't bother because it wasn't needed and neonic use on corn seeds dropped from nearly 100% to 2%. A Cornell study found that use of neonic treated seed in corn and soybeans "provided no overall net income benefit to farmers."[ii]

Independent scientists have been saying it for a while now: neonicotinoid pesticides aren't all they're cracked up to be. And finally, scientists and economists at the Environmental Protection Agency (EPA) are showing signs that they're listening to the science.

The EPA has found that imidacloprid likely harms 80% of all threatened and endangered species, including 70 mammals, and 77 birds. They are the most widespread insecticides in agricultural use in Maine, most often as a seed treatment, a use that the EPA has exempted from reporting requirements. In October, 2024, EPA released preliminary findings on neonic-coated soybeans — a small part of the agency's broader review of neonicotinoids. EPA's headline finding? Neonicotinoid seed treatments "provide negligible overall benefits to soybean production in most situations." The EPA also highlighted the potential for these treatments to harm nontarget organisms and ecosystems, including aquatic insects, birds, and small mammals.[iii]

The diagram below illustrates the environmental fate of neonicotinoid insecticides when applied to crop seeds. Only 5% of the pesticide goes where it is wanted, in the crop, a figure calculated by manufacturer Bayer's own scientists [Sur & Stork 2003]. Most ends up accumulating in the soil, from where it can be absorbed by the roots of wildflowers and hedgerow plants, or can leach into streams [Wood & Goulson 2018]. Neonicotinoids are water soluble, leaching from soils into streams and rivers. There is also a fundamental problem with this mode of application, since it is necessarily prophylactic: it is impossible for the farmer to know whether the crop will be attacked by pests before he has sown the seeds. Prophylactic use of pesticides is contrary to all of the principles of Integrated Pest Management, a widely-accepted approach that seeks to minimize pesticide use. [iv]



The decline of insects began several decades ago and is caused by a multitude of factors with cumulative effects [9–11]. The main causes are the use of pesticides and the destruction, degradation, or fragmentation of natural habitats, and to a lesser extent, invasive species, climate change and overexploitation [12]. Pollutants whose occurrence in nature has drastically increased in recent decades are also likely implicated: endocrine disruptors, heavy metals and electromagnetic fields [13–15]. Agrochemicals have synergistic toxic effects: two pesticides,

each administered at a dose that kills 10 % of test animals, can kill up to 90 % when administered simultaneously [16].[v]

Maine agriculture and forest health depend in large part on healthy pollinators. Specifically, honey bees play a pivotal role in blueberry and orchard crops. Multi-stress conditions are considered the most putative cause of honeybee decline. The ongoing reduction of domestic and natural pollinators is considered a very severe signal of the current loss of biodiversity, and it requires a broad research effort to clarify the causes. In research by Lupi, et al, the combined effects of two possible stress sources for bees, pesticides and electromagnetic fields (multi-stress conditions) were analyzed by a field trial. After one year of monitoring, a complex picture of several induced effects was present, especially in the multi-stress site, such as disease appearance (American foulbrood), higher mortality in the underbaskets (common to pesticide-stress site), behavioral alterations (queen changes, excess of both drone-brood deposition and honey storage) and biochemical anomalies (higher ALP activity at the end of the season). The multi-stress site showed the worst health condition of the bee colonies, with only one alive at the end of the experimentation out of the four ones present at the beginning.[vi]

Maine agriculture and forestry and thus economic health are under considerable and multiple stresses including climate change, pesticide use, spruce budworm, ash borer, increasing electromagnetic radiation, drought and species decline. We also have seen major declines in health, particularly in children and immune-compromised populations. Neonicotinoids are an important contributor to the decline in our wide worlds of biological and economic health.

By reducing neonic use, LD 1323 can help us all. Please vote Ought to Pass on this LD.

Thank you.

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[i] HEAVY COSTS: Weighing the Value of neonicotinoid insecticides in agriculture. 2014, Center for Food Safety

[ii] Grout, et al. 2020. Neonicotinoid Insecticides in New York State: economic benefits and risk to pollinators. Cornell University

[iii] Benefits of Neonicotinoid Seed Treatments to Soybean Production 2024

[iv] Goulson, D. FRES, 2019. Insect Declines and Why they Matter, The Wildlife Trust, Somerset, UK

[v] Thill, et al 2023 Biological effects of electromagnetic fields on insects: a systematic review and meta-analysis. Rev Environ Health 2023; aop

[vi] Lupi, et al 2021 Combined Effects of Pesticides and Electromagnetic-Fields on Honeybees: Multi-Stress Exposure

Friends of Merrymeeting Bay (FOMB) utilizes research, education, advocacy, and land conservation to preserve, protect, and improve the unique ecosystems of Merrymeeting Bay and Gulf of Maine.