

To Honorable Chair Carolyn Partridge and committee members:

On 1/26 I was able to listen to testimony to and questions from your committee regarding effects of neonicotinoid-treated seeds on wildlife, birds, mammals and soil biota. Below I provide quotes from several sources to respond to your questions.

Neonic effects on birds:

"...[N]eonicotinoids are lethal to *birds* as well as to the aquatic systems on which they depend. A single corn kernel coated with a neonicotinoid can kill a songbird....As little as 1/10th of a corn seed per day during egg-laying season is all that is needed to affect reproduction with any of the neonicotinoids registered to date."

"Depending on the specific insecticide, we have found that EPA underestimates toxicity by 1.5 - 10 fold if the intent of the exercise is to protect most potentially exposed bird species, and not merely mallards and bobwhites, the two test species.

"In addition, there is some evidence that the neonicotinoid insecticides will debilitate *birds* at a *much reduced fraction of a lethal dose* compared to other pesticides and this debilitation will be longer-lasting. Small non-lethal doses are likely to cause partial paralysis and other sub-lethal effects in birds. These effects slip under the radar screen in regulatory assessments based entirely on lethal levels.

"Regardless of the exact label directions and requirements, seed-treatment chemicals are widely available to birds. Seeds are never fully covered with soil, making them easy

to find by foraging birds. Spills are commonplace with current machinery. And many species have the ability to scrape and dig for planted seed.

Seed treatments, by definition, will result in a high exposure situation for birds."

(Source: Neonicotinoid Insecticides and Birds. *The American Bird Conservancy*, 2013. Written by Dr. Pierre Mineau and Cynthia Palmer. https://abcbirds.org/wp-content/uploads/2015/05/Neonic_FINAL.pdf)

effects on other wildlife:

"Studies have linked neonicotinoids to mortalities and adverse sublethal impacts for other types of bees, grasshoppers, beetles, and other insects, as well as other invertebrates critical to soil health, such as *nematodes and earthworms*. These insecticides cycle through ecosystems with additional documented harms to *amphibians, birds, fish, deer, and other organisms*.

"Several studies have also linked neonicotinoids to *adverse developmental and reproductive effects in mammals*. These findings have concerning potential implications for human health, particularly considering frequent human exposure to neonicotinoid compounds, often through contaminated water and residues on food. Monitoring of urine samples by the Centers for Disease Control and Prevention finds that roughly half the U.S. population shows recent exposures to neonicotinoid insecticides, with higher levels found in children."

(Source: Letter to New York Assembly Standing Committee on Environmental Conservation, September 2021)
attached

"Researchers are learning that insecticides like neonics can predispose *bat populations* to *white-nose syndrome* by further lowering the immune systems of exposed animals.

Moreover, neonics like Imidacloprid, Thiamethoxam and Thiacloprid have been shown to disrupt torpor (when a bat reduces its body temperature and metabolic rate over the winter), either by affecting the thyroid or prostaglandin systems. When a bat isn't able to go into and stay in torpor, its health is easily compromised. "

<https://blog.cwf-fcf.org/index.php/en/neonictinoids-and-bats-yet-another-danger-for-an-already-endangered-species/>

"Persistence in soils, waterways, and nontarget plants is variable but can be prolonged; for example, the half-lives of neonicotinoids in soils can exceed 1,000 days, so they can accumulate when used repeatedly. Similarly, they can persist in woody plants for periods exceeding 1 year. Breakdown results in toxic metabolites, though concentrations of these in the environment are rarely measured."

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4284396/>

Thank you for your thoughtful consideration of H.626, and for asking questions about the adverse impacts of neonicotinoid -treated seeds on wildlife and soil organisms. If I can help find more information on these issues, please let me know.

Best regards,
Sylvia Knight

Earth Community Advocate & Researcher
Burlington, VT 05408

(attached PDF)

September 20, 2021

Assembly Standing Committee on Environmental Conservation

Legislative Office Building

Albany, NY 12224

Re: Neonicotinoid Insecticides Pose Significant Threats to Pollinators and the Environment in New York State

Dear Chairman Englebright and the Assembly Standing Committee on Environmental Conservation,

We are scientists with expertise on pollinators and the environmental and health impacts of pesticides, writing to urge you to take action to reduce the unnecessary and harmful use of neonicotinoid insecticides in New York. Based on findings from numerous scientific studies on the negative impacts of neonicotinoid use and a recent cost-benefit analysis for New York State by Cornell University researchers, we urge the committee to take action to restrict the unnecessary and harmful use of neonicotinoids for seed treatment of corn, soybean, and wheat seeds as well as most non-agricultural turf and ornamental uses.

Pollinators, including managed honeybees and bumble bees, wild bees, butterflies, wasps, and myriad other insects, are critical for the survival of New York's agriculture and environment. There is strong scientific support indicating that widespread neonicotinoid insecticide use poses significant risks to pollinators, impairs water and soil quality, and threatens biodiversity.¹ In New York, some of the most common uses of these insecticides either provide no economic benefit or can be easily replaced with less risky alternatives.² New York's pollinator population has experienced concerning declines, threatening biodiversity and jeopardizing key pollination services the agricultural sector relies upon.³ As systemic insecticides, neonicotinoids are incorporated into plant tissues and contaminate pollen and nectar, on which pollinators feed and thus can experience exposure and resulting harm.⁴ Neonicotinoid insecticides additionally contaminate soil, leach into water supplies, and can persist in the environment for years.⁵ These multiple pathways of exposure often pose threats to non-target insects including honey bees, wild bees, and other pollinators. Neonicotinoid exposures at relatively low, field-relevant concentrations have been shown to impair honeybee activity, locomotion, metabolism, development, learning and memory consistently across studies.⁶ These pesticides also make honey bees more susceptible to pathogens and parasites, such as Varroa mites, which can pose a severe threat to entire colonies.⁷ In addition, studies have linked neonicotinoids to mortalities and adverse sublethal impacts for other types of bees,⁸ grasshoppers,⁹ beetles,¹⁰ and other insects,¹¹ as well as other invertebrates critical to soil health, such as nematodes¹² and earthworms.¹³ These insecticides cycle through ecosystems with additional documented harms to amphibians, birds, fish, deer, and other organisms.¹⁴

Several studies have also linked neonicotinoids to adverse developmental and reproductive effects in mammals.¹⁵ These findings have concerning potential implications for human health, particularly considering frequent human exposure to neonicotinoid compounds, often through contaminated water and residues on food. Monitoring of urine samples by the Centers for Disease 2

Control and Prevention finds that roughly half the U.S. population shows recent exposures to neonicotinoid insecticides, with higher levels found in children.¹⁶

In addition to their direct impacts on pollinators and other organisms, neonicotinoid insecticides contribute to persistent soil and water pollution. In New York, neonicotinoids have been observed regularly in surface waters at levels above the U.S. Environmental Protection Agency benchmark level for harm to aquatic wildlife and with concerning frequency in Long Island groundwater.¹⁷ Once introduced into the environment, neonicotinoids can take years to degrade and some secondary compounds resulting from the breakdown of neonicotinoids can further harm pollinators.¹⁸ Nationwide, over the past two decades, the acute toxicity loading of insecticides on agricultural land and surrounding areas has increased between 9-fold and 48-fold, driven largely by neonicotinoid insecticides.¹⁹ Therefore, ongoing use of neonicotinoid insecticides is likely to have long-lasting and harmful effects, and taking action to reduce their use is urgent to limiting additional accumulation in the environment.

As the committee has noted, last year, researchers at Cornell University published a report titled, *Neonicotinoid Insecticides in New York State: Economic Benefits and Risk to Pollinators*.²⁰ The report analyzed over 1,100 peer-reviewed studies on the risks to pollinators from neonicotinoid insecticides in field crop, fruit, vegetable, ornamental, and forestry uses, as well as the costs and benefits of neonicotinoid alternatives as compared to neonicotinoids. The report found that: (1) the use of neonicotinoid-treated corn, soybean, and wheat seeds pose a clear, substantial, and persistent risk to pollinators in New York; and (2) there is “no overall net income benefit” to using these neonicotinoid-treated seeds compared to untreated seeds.²¹ Similarly, use of neonicotinoids in non-agricultural ornamentals and turf settings show high risk to pollinators, but can be eliminated or replaced with effective alternatives that pose much lower risks to pollinators. These uses are distinct from limited uses against invasive species like emerald ash-borer and hemlock woolly adelgid, where neonicotinoid treatment may be warranted. While the public notice for this hearing states that “the report did not contain any recommendations,” these findings present the opportunity for a clear and straightforward solution to minimizing risks to pollinators through reducing the most harmful uses. In particular, the committee should seek to eliminate the use of neonic-treated corn, soybean, and wheat seeds and non-agricultural turf and ornamental uses of neonicotinoids, except for limited invasive species treatment.

Prohibiting unnecessary neonicotinoid uses would address the vast majority of neonicotinoids entering New York’s environment, without disadvantaging growers or significant disruption to other users. The conclusions of the 2020 Cornell report are supported by several other studies that show that use of neonicotinoid-treated corn and soybean seeds do not provide yield benefits or economic benefits,²² yet these seeds alone account for an estimated 73% of neonicotinoid use in New York state agriculture.²³ Similarly, neonicotinoid turf and ornamental uses likely constitute the vast majority of non-agricultural neonic uses in the state, but these uses are often not needed. Where insecticide use may be warranted—a number of effective, less risky alternatives exist.

There is strong scientific support linking neonicotinoid pesticides to risks to pollinators, soil and water quality, and biodiversity. We urge you to take action to eliminate needless or wasteful neonic uses—in particular, neonic-treated corn, soybean, and wheat seeds and non-agricultural turf and ornamental uses. We also encourage the state to review risks and benefits associated with 3

neonicotinoid use in other contexts and restrict or prohibit use where warranted to protect New York's pollinators, ecosystems, or public health.

If you have questions regarding neonicotinoids or the content of this testimony, we would welcome the opportunity to speak with you. Thank you for your time and attention to this important matter.

Respectfully,

Jean-Marc Bonmatin, Ph.D.

Researcher

Centre National de la Recherche Scientifique (CNRS)

Centre de Biophysique Moléculaire

France

David O. Carpenter, MD

Director

Institute for Health and the Environment

University at Albany

Michael J. DiBartolomeis, Ph.D., DABT Toxicology Research International

Dave Goulson, Ph.D.

Professor of Biology

School of Life Sciences

University of Sussex

Greg J. Hunt, Ph.D. Professor Emeritus

College of Agriculture Purdue University

Susan Kegley, Ph.D.

Principal Scientist

Pesticide Research Institute, Inc.

Philip J. Landrigan, MD, MSc, FAAP

Director, Program for Global Public Health and the Common Good

Director, Global Observatory on Pollution and Health

Professor of Biology Schiller Institute for Integrated Science and Society

Pierre Mineau, Ph.D.

Principal Senior Scientist, Pierre Mineau Consulting

Adjunct Professor, Department of Biology, Carleton University

Vice President of the Board, Salt Spring Conservancy