NRDC ACTION FUND

April 21, 2025

Sen. Aric Putnam
Chair, Committee on Agriculture, Veterans, Broadband, and Rural Development
Minnesota State Senate

RE: Testimony of NRDC Action Fund SUPPORTING SF3083

Dear Chair Putnam and Members of the Committee:

On behalf of the NRDC Action Fund and its thousands of members and advocates in Minnesota, I submit the following testimony in strong support of SF 3083. Building from past recommendations of the Minnesota Department of Agriculture (MDA), this common-sense bill ensures that the most widespread uses of toxic insecticides, like neurotoxic neonicotinoids, are regulated and used only where they benefit farmers.

As explained at length in the following testimony, the science is now unequivocal that neonics are a lead cause of dramatic losses of bees and other pollinators, which cut into farmers' bottom lines and threaten the viability of our food systems and ecosystems. Already, pollinator losses undermine food production, threatening the availability of healthy and affordable foods.

Equally concerning is the profound scope and depth of the harms neonic pollution inflicts on the state's environment and its people. Neonics extensively contaminate Minnesota's water, soil, plant life, and even Minnesotans themselves. Neonics show up in Minnesota's surface water, ground water, and even rain, as well as 94% of deer from all over the state. Scientific evidence links such contamination to mass losses of birds and fish, the hollowing out of ecosystems, and birth defects and death in white-tailed deer.

Worse still, Centers for Disease Control and Prevention (CDC) monitoring finds neonics appear in the bodies of half the U.S. population at any given time, as other research links neonics to neurological and developmental disorders in people, including malformations of the developing heart and brain. More recent research detected neonics in the bodies of more than 95% of pregnant women tested, presenting further cause for concern about developmental harms.

90 percent or more of the neonics entering Minnesota's environment come from crop seeds—mainly corn and soybean—coated with neonics. Nearly 100% of corn and up to 75% of soybean is grown from neonic-coated seed. Despite their widespread use, research increasingly demonstrates that these leading neonic seed coating uses provide no net benefits to farmers. This means that farmers are paying a premium for chemical treatments with disastrous effects on the environment and risks to human health, without seeing economic returns.

Treated seeds are not just harmful and frequently needless—they are largely unregulated in Minnesota. While MDA regulates pesticide use statewide, the agency does not regulate treated seeds as "pesticides," and they escape safeguards designed to protect people and the environment from chemicals designed to kill.

HF 3083 does not prohibit any pesticide use. It simply creates a program to allow MDA to regulate treated seeds, and ensures that these seeds are used only where they actually benefit farmers. NRDC Action Fund strongly urges your support for this common-sense bill.

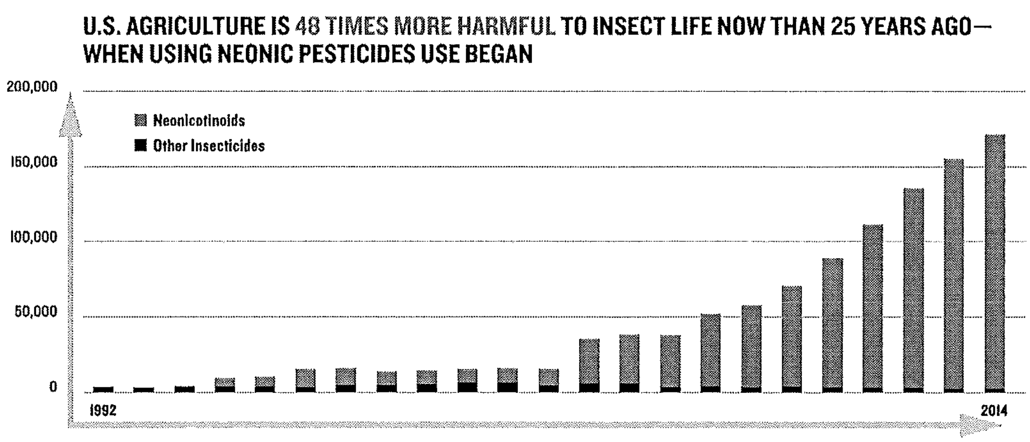
Neonics Are Toxic, Persistent, and All Around

Neonics are neurotoxic pesticides that kill insects by permanently binding to, overstimulating, and ultimately destroying their nerve cells.[1] Insects poisoned with neonics often exhibit twitching, followed by paralysis and then death.[2] There are three factors that make neonics especially problematic for the environment and public health.

First, neonics are extremely toxic to insects and other invertebrates. Just one square foot of lawn treated with a neonic product at EPA-approved rates can contain enough neonic to kill over one million bees.[3] And even at miniscule, non-lethal doses, neonics weaken critical functions, such as an insect's immune system, navigational ability, stamina, memory, and fertility—making it harder or impossible for them to survive.[4] Recent research has shown that a single exposure to a neonic can reduce population growth rates for multiple generations.[5]

One study estimates that since neonics were first introduced, U.S. agriculture has become 48-times more harmful to insect life.[6] 98% of this increase was attributable to neonics, the number one use of which is on treated seeds.

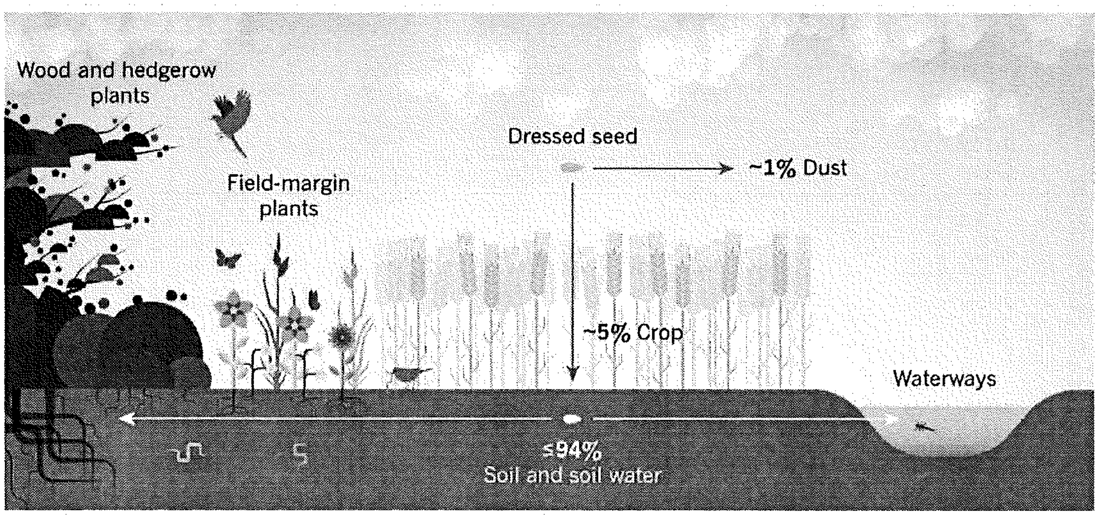
TOTAL ACUTE ORAL INSECT-TOXICITY LOAD OF INSECTICIDES IN U.S. AGRICULTURE BY YEAR (IN LD_{50}-DAYS)



Data from Michael DiBartolomeis et al., "An Assessment of Acute Insecticide Toxicity Loading (AITL) of Chemical Pesticides Used on Agricultural Land in the United States," *PLoS One* (August 6, 2019).

Second, neonics are exceptionally good at contaminating the entire environment. Unlike older, conventional insecticides, neonics designed to be "systemic," meaning they are absorbed by plant tissues in order to make the plant itself—including its nectar, pollen, and fruit—toxic. This property allows neonics to be applied as a coating on a plant's seed, which the plant then absorbs as it grows.

Treated seed applications are remarkably inefficient and likely to lead to widespread pollution. Of the typical neonic treatment on a corn or soybean seed, only 2-5% of the active ingredient is absorbed into the target plant—leaving the other 95+% in the soil,[7] where the chemicals persist for years.[8] Once in the soil, neonics are easily carried considerable distances by rain or irrigation water to contaminate new soil, the plants in that soil (as they absorb the chemicals and also become toxic), and water supplies.[9]



Reprinted by permission from Springer Nature: Dave Goulson, "Pesticides Linked to Bird Declines," *Nature* 511, no. 7500 (July 2014): 295-96, https://go.nature.com/2rNOZcK.

Third, neonics are the most widely used insecticides in the United States. Nearly all conventional corn and 75% of conventional soybean seeds are pretreated with neonics,[10] meaning neonics are used on over 12 million acres in Minnesota—on corn and soybean alone. But they are approved for use on over 140 crops, as well as on lawns and gardens nationwide. The five major neonic chemicals approved for outdoor use—acetamiprid, clothianidin, dinotefuran, imidacloprid, and thiamethoxam—appear in more than a thousand products.

Because neonics build up in areas of year-after-year use[11] and spread out with each rainfall or watering, their extensive and continual use means that there are large portions of the country where neonic contamination of soil, water, and plant life is virtually ubiquitous. Evidence of widespread contamination is especially strong in Minnesota. Testing of white-tailed deer by the Minnesota Department of Natural Resources (DNR) has detected neonics in 94% of Minnesota's deer, with 64% at levels that have been shown in other studies to increase fawn mortality.[12] And water testing has frequently detected neonics in surface waters and groundwater throughout the state—and even in rain.[13] A recent analysis found that of sites regularly sampled by MDA for neonics, 95% have neonic detections.[14] This is consistent with independent testing finding at least one neonic in 97% percent of creek and river samples across the state.

Neonics Drive Pollinator Losses, Threatening Farmers' Bottom Lines and Food Security

Pollinators are critical to agricultural production. Yet, since the mid-2000s—when annual losses of honey bee colonies skyrocketed nationwide—Minnesota beekeepers have consistently lost

40% or more of their colonies each year.[15] Last year, amid historic bee losses nationwide, Minnesota beekeepers lost an estimated 75% of their colonies: the worst year on record.[16]

While total bee colony levels remain steady due to the considerable, expensive, and potentially unsustainable efforts of beekeepers to breed and replace lost colonies, the same is not true for disappearing populations of the state's 450+ wild bee species and other pollinators that contribute significantly to crop pollination. For example, Minnesota's state bee, the rusty patched bumble bee, has declined by nearly 90% in recent decades. The U.S. Fish and Wildlife Service has identified pesticides, and specifically neonics, as a likely driver of this precipitous decline.[17]

Among all the stressors affecting bees, only the dramatic uptick in the use of neonicotinoid pesticides in the mid-2000s—mainly from increased use on corn and soybean seeds[18]—matches the dramatic uptick in bee losses witnessed at precisely that time.[19] Since that time, a large and growing body of research confirms neonics are a leading cause of bee and other pollinator declines, including several comprehensive global literature reviews[20] and the largest neonic field study to date—actually funded by the pesticide industry itself.[21] In 2020, Cornell University published its own review of over 1,100 studies finding substantial harms from a broad variety of neonic uses, [most notably from treated corn, soybean, and wheat seeds as well as] including non-agricultural turf and ornamental uses.[22]

Populations of bees, butterflies, and other beneficial insects across the globe have rapidly declined in the time since neonics were first introduced—a trend sometimes likened to an "insect apocalypse." Research increasingly identifies neonics as a leading cause.[23] In 2024, researchers identified increase neonics use as "a major driver of changes in occupancy across hundreds of wild bee species."[24] Neonic use is also linked to significant declines in butterflies,[25] particularly monarchs,[26] which can encounter harmful or deadly levels of neonics in farm fields or nearby wild plants that can absorb neonics and stay toxic for years. In fact, neonic treated seeds were recently identified as the number one factor correlated with monarch butterfly declines in the Midwest.[27]

These neonic-driven pollinator losses are already harming farmers. A 2023 study estimates that inadequate pollinator populations are reducing production of fruits, vegetables, and nuts by 3-5% worldwide.[28] Reduced production of these health foods is, in turn, leading to an estimated 427,000 additional preventable deaths annually.[29] And these deaths are disproportionately in wealthier countries like the United States, where reduced access to healthy foods is more likely to shift people's diets to cheaper, unhealthy alternatives.

Similarly, a major 2020 pollination study shows that many top fruit crops are "pollinator limited" across the nation, meaning that a lack of bees (including wild bees) and other pollinators is currently lowering crop yields.[30] Aside from the immediate economic impacts to farmers, Dr. Winfree—a leading pollinator researcher and one of the study's authors—spoke about the long-term implications of the study's findings for food security:

> Honeybee colonies are weaker than they used to be and wild bees are declining, probably by a lot. . . . Even if honeybees were healthy, it's risky to rely so much on a single bee

> species. It's predictable that parasites will target the one species we have in these monocultural crop fields.
>
> The trends we are seeing now are setting us up for food security problems. . . . We aren't yet in a complete crisis now but the trends aren't going in the right direction. Our study shows this isn't a problem for 10 or 20 years from now – it's happening right now.[31]

Accordingly, the current impact to farmers' bottom lines and the cost and availability of fresh, healthy foods—both of which likely disproportionately harm already vulnerable and disadvantaged communities—will likely worsen given current trends.

While statewide pollinator losses affect farmers whether or not they use neonics on their farm, studies show that—by driving pollinator losses—neonics can decrease yields even on the crops to which they are applied.[32] Off the farm, 87.5% of flowering plants require pollination by bees and other pollinators to reproduce, so further losses not only threaten Minnesota's food system, but also its ecosystems.[33]

Beyond pollination, neonics harm other beneficial insects essential for farming—such as nematodes,[34] earthworms,[35] and pest predators[36]—and can disrupt other key components of soil health. Pest predators are especially at risk from eating contaminated insects, as the harmful neonic levels can remain in insect prey,[37] leading to decreased yields as the beneficial predator populations die out.[38] Perhaps unsurprisingly, a study of northern Great Plains farms found that fields using neonics and other conventional insecticide treatments had 10 times the insect pressure and fewer profits compared with those employing regenerative farming methods, likely due to lower input costs, more "good bugs" that keep pest populations under control, and better crop marketability.[39] Research also shows that neonics may harm soil health directly by changing the composition of soil microbial communities—harming beneficial bacteria crucial for plant growth and health and soil fertility and quality.[40]

Neonics Contribute to Mass Losses of Birds

As losses of insects multiply, insect-eating animals suffer too. Birds appear particularly vulnerable—96% of land-based birds feed insects to their young, with many species also relying on insect food sources as adults.[41] In North America, 30% of birds have disappeared in the past fifty years,[42] with research linking neonics to large losses in bird biodiversity, including annual losses of up to 12% in grassland species and 5% in insect-eating species.[43] Likewise in Europe, Dutch researchers have linked declining populations of insect-eating birds to the introduction of neonics—even in areas with exceptionally low neonic levels (20 parts per *trillion* in water)[44]—and the pesticides are also believed to play a key role in declines of French farmland birds.[45]

Neonics harm birds directly, too. Eating just one neonic-treated crop seed is enough to kill some songbirds.[46] And at nonlethal doses, neonics can damage birds' immune and reproductive systems, cause rapid weight loss, and impair navigation and migration ability—all reducing the likelihood of their surviving and reproducing in the wild.[47] With hundreds of millions of acres of U.S. farmland sown with neonic-treated seeds every year, birds are broadly at risk—particularly when, as commonly occurs, piles of seed are left out in the open or planted shallowly enough for birds to eat.[48] At least one assessment has made the case that bats can also be harmed directly or indirectly.[49]

Neonics Threaten the Health of Minnesotans, Especially Children

Neonicotinoids are chemically similar to nicotine, attacking nerve sites that insects and humans share, and which play a central role in the operations of our brain and nervous systems.[50] More specifically, critical parts of the brain are densely populated with nerves containing the particular nACh receptor area targeted by neonics (the α4β2 subunit), including: the cortex (responsible for planning, judgment, creativity, inhibition, attention, memory, language); the thalamus (emotion, memory); and the cerebellum (posture, balance, coordination, speech).[51]

Health experts have long been concerned about the impact of nicotine-like substances on the brain—a reason they have long warned pregnant women to avoid nicotine.[52] Perhaps unsurprisingly, then, a growing body of research now links neonic exposures to elevated risk of developmental or neurological damage in humans, particularly in infants and young children.[53] These include malformations of the developing heart and brain, autism spectrum disorder, and a cluster of symptoms including memory loss and tremors.[54] Animal testing shows an even broader range of concerning injuries with implications for human health, including: multiple birth defects and increased rates of death for the fawns of white-tailed deer fed "field realistic" (i.e., "real world") levels of neonics in water;[55] reduced thyroid functioning in deer;[56] and in toxicology experiments with pregnant rats exposed to neonics resulted in offspring with statistically significant deficits such as thinner brain cortexes and other brain abnormalities, altered behavioral reflexes, and decreased sperm and testosterone levels.[57]

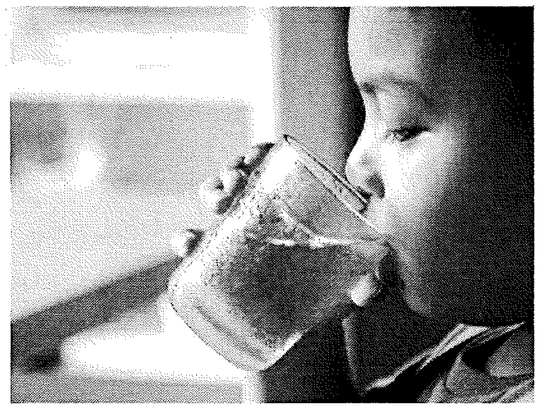
Information and studies collected by the U.S. Environmental Protection Agency (EPA) reaffirm the risks posed by neonics, yet these risks are often undercounted and ignored in regulatory decisionmaking. EPA poisoning reports reveal that hundreds of people have been poisoned with neonics, with some fatalities reported.[58] And a recent analysis of pesticide manufacturer-submitted toxicity studies concluded that EPA is ignoring statistically significant harms in those studies, meaning EPA's regulatory standards are likely inadequate to protect Americans from widespread exposure.[59]

These data likely raise concerns for all Minnesotans. In 2019, the Centers for Disease Control and Prevention (CDC) published the updated results of its national biomonitoring program, which measures pesticides in the urine of thousands of Americans age three and older.[60] The update included data from 2015-16, and was the first to include neonics. The results showed that roughly half of the U.S. general population is exposed to neonics on a regular basis, with children having higher levels than adults.[61]

More recent data suggests that neonic exposures have grown significantly in recent years, with risks of exposure especially acute for pregnant women and young children. A 2022 multistate study of 171 pregnant women found that over 95% had neonics or neonic degradates in their bodies.[62] Levels detected were generally greater than those detected by the CDC, and further, levels steadily increased over the course of the four-year study period, with Hispanic women having the highest levels. Similarly, surveys of deer in Minnesota show increasing contamination over time—from 61% of deer in 2019 to 94% in 2021.[63]

These widespread and growing exposures are a considerable concern for childhood neurological development, as we now know the pesticides pass readily from pregnant women to unborn fetuses. A 2022 study shows that neonics flow through the placenta along with oxygen and critical nutrients from mothers to their fetus, and then to all the fetal tissues including the developing brain and nervous system.[64] Previously, Japanese researchers had identified neonics in the urine of newborn babies, further supporting the idea that neonics pass from a pregnant mother to her developing fetus.[65] This is highly concerning given the multitude of studies suggesting developmental risks from neonic exposure.

People are commonly exposed to neonics through food and water.[66] Conventional chlorination alone, without carbon filtration treatment, generally fails to remove neonics from drinking water.[67] More concerning still, neonics break down in water, forming chemicals that can be several hundred times more toxic to people than the original neonic chemical, which then may be made more toxic still through the chlorination process.[68]



Emerging research links neonic exposures to elevated risk of developmental and neurological damage in humans, particularly in infants and young children.

Neonic-Treated Seeds Often Provide No Benefits for Farmers

Peer-reviewed research demonstrates that the most common uses of neonic-treated seeds—those on corn and soybean—often provide *no economic benefit for farmers. See* Grout et al. 2020 (review of 1,100+ peer-reviewed studies finding neonics provide "no overall net income benefit" to growers); Smith et al. (2020) (4-yr study of 160 corn and soybean fields in Ontario finding "that widespread use of seed-applied insecticides in corn and soybean is unlikely to provide benefit to producers"); Labrie et al. (2020) ("neonicotinoid seed treatments in field crops in Quebec are useful in less than 5% of cases, given the very low level of pest-associated pressure and damage, and [] they should not be used prophylactically."); Pacenka et al. (2021) (4-yr Purdue University study finding "the absence of a neonicotinoid [corn] seed treatment had no impact on yields"). That is especially true in northern climates, like Minnesota.[69] Despite this lack of efficacy, neonic seed treatments are used on nearly all conventional corn, and more than half of conventional soybean acres. [70]

Furthermore, research in Quebec, Canada, suggests that *any* insecticide seed treatment is unnecessary in the vast majority of circumstances. Labrie et al. demonstrated that although targeted pests (like wireworm) were more prevalent in fields without neonic seed treatments, yield was unchanged.[71] In other words, the presence of pests targeted by seed treatments did not reduce crop yields. Insecticide seed treatments were simply not necessary.

Though seed prices vary, farmers are likely paying a premium for seeds that ultimately do not provide an economic return. Using prices provided by Bayer CropScience, one study found that untreated corn seeds cost $20.15 less per acre than neonic-treated seeds, and fungicide-only seeds cost $6.80 less.[72] For soybeans, untreated seeds cost $20.70 less than neonic-treated seeds, and fungicide-only seeds cost $5.10 less based upon farm-level data from independent research.[73]

Other Systemic Insecticides Threaten to Replace Neonic Seed Treatments, but Pose Many of the Same Risks

Currently, neonics are by far the most commonly used insecticides in seed treatments. But newer classes of pesticides, like diamides, are similarly approved as seed treatments. Both neonics and diamides are systemic pesticides, meaning they are similarly adept at contaminating the environment. Diamides like chlorantraniliprole are generally more persistent in the environment than neonics[74] and research suggests they present significant risks to monarchs and other butterflies.[75]

At the same time, research suggests that diamides are similarly not beneficial to farmers because, as explained above, presence of early-season soil pests targeted by seed treatments do not decrease crop yields. It is, therefore, important to not only address neonic-seed treatments, but systemic insecticides generally, to ensure that newer, similarly harmful pesticides do not simply replace neonics on millions of acres across Minnesota.

SF3083 Helps Eliminate High-Risk, Low-Benefit Pesticide Uses That are Largely Unregulated

Among other things, SF 3083 directs MDA to develop a regulatory program to address harmful pesticide contamination stemming from widespread and largely unnecessary use of pesticide-coated seeds. MDA currently does not exercise its regulatory authority over pesticide-coated seeds. As a result, it does not know what pesticides are used on treated seeds or where they are used and fails to mitigate harms associated with treated seed use.

The regulatory program in HF 2761 would also include a "verification of need" program for seeds treated with systemic insecticides, like neonics and diamides. This provision would guard against widespread use of harmful pesticides that provide no actual benefits to farmers—as is currently the case on millions of acres across Minnesota. MDA proposed developing a verification of need program for all neonics in 2016 because of their widespread prophylactic use in circumstances when no insecticide is needed.

Quebec Provides a Model for Successful Action

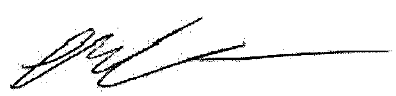
If SF 3083 were enacted, Minnesota would not be alone in tackling the neonic problem. Quebec, Canada, provides one model for implementing a verification of need program like the one contemplated by this bill. In 2019, the province began requiring farmers to obtain an agronomic justification before using neonic seed treatments in corn and soybean. The program was wildly successful. Neonic contamination has since plummeted, while crop yields have been unaffected by the new restrictions. Quebec is now moving to expand the program to all insecticide seed treatments,[76] consistent with the research showing that insecticide seed treatments in corn and soybean generally do not benefit farmers.

Last year, New York and Vermont became the first states to pass bills to limit neonic-treated seed use. While it remains to be seen how those bills will be implemented, they may look similar to the Quebec model discussed above.

Conclusion

Treated seeds likely make up more than 90% of neonic use in Minnesota. Ubiquitous neonic contamination drives declines in pollinators that are critical to food production, threats wildlife from birds to fish, and presents serious risks to the health of Minnesotans, especially children and pregnant women. Despite these risks, MDA currently exercises no regulatory authority over pesticide-treated seeds. SF 3083 would direct MDA to address this massive regulatory loophole and ensure that these harmful pesticides are used only where they benefit farmers, all in a way that works for Minnesota. **For these reasons, NRDC Action Fund strongly supports SF 3083 and urges your support for this crucial bill.**

Respectfully,



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Senior Advisor, NRDC Action Fund

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Letter of Support for SF3083: Develop Pesticide Management Plan for Pesticide-Treated Seed

To: Senator Aric Putnam, Chair
Agriculture, Veterans, Broadband, and Rural Development Committee
Minnesota State Senate

Date: April 18, 2025

Dear Senator Putnam and Committee Members,

My name is **Brian Fredericksen**, and I am the owner and head beekeeper at **Ames Farm** in Delano, Minnesota. I am writing to express my full support for **SF3083**, which calls for the development of a pesticide management plan for pesticide-treated seeds, including those treated with neonicotinoids.

I've been keeping bees in Minnesota for over two decades. What I've witnessed over those years—and especially in the past 12 months—is nothing short of catastrophic. This past winter alone, over **1.25 million commercial honeybee colonies were lost** nationwide, representing **nearly half** of all managed hives in the U.S. This is a collapse not just of bee colonies, but of an entire agricultural support system.

Neonicotinoid-treated seeds are a key contributor to this collapse. These systemic chemicals, absorbed by the plant and expressed in its pollen, nectar, and tissues, deliver sublethal and lethal doses to bees and native pollinators alike. They persist in the soil and water for years and are now found throughout our ecosystems—even in the organs of Minnesota's wild deer. Yet, because these seeds are treated before sale and not sprayed in the field, they fall into a **regulatory loophole** that prevents meaningful oversight by the Minnesota Department of Agriculture.

It's time we close that loophole.

The science is clear. The Minnesota Department of Natural Resources' 10-year Bee Survey shows that **entire counties in southwestern Minnesota now have zero native bees**—what I call the "Pollinator Death Zone." That should alarm anyone who cares about the future of agriculture and food security in this state. The Minnesota Department of Agriculture's own data confirms high levels of neonics in our waterways during corn and soybean planting seasons, directly linked to treated seed usage. These levels are toxic to the aquatic insects that form the base of our food webs.

Minnesota once produced **20 million pounds of honey** annually. Today, due to pollinator declines and habitat loss, we struggle to produce even a quarter of that. Commercial beekeeping operations are shrinking under the weight of repeated losses, rising costs, and falling honey prices. This is not sustainable.

We must stop pretending that beekeepers and pollinators can survive on the periphery of a system that gives them nothing to live on—from spring to fall. If Minnesota is to live up to its values of stewardship and innovation, we must lead—not lag—on protecting pollinators. That starts with passing SF3083 and taking concrete action to **monitor, regulate, and reduce** the impact of neonic-treated seeds.

We also need to rethink how we support pollinator habitat. We should be incentivizing rural landowners and agricultural producers to plant diverse, native species that bloom across the growing season. We need public education campaigns, corporate accountability, and policies that reward regenerative and pollinator-inclusive practices. It's time we stopped talking about "saving the bees" and started asking: **What are we doing to support pollinator habitat?**

At Ames Farm, we've committed our own land and resources to habitat restoration. We partner with landowners who allow our bees to thrive in natural, healthy environments. But we can't do it alone. We need leadership at the state level—leadership that values science, biodiversity, and the long-term health of Minnesota's farms and communities.

SF3083 is a step in the right direction, and I urge you to support its passage.

Sincerely,
Brian Fredericksen
Owner / Beekeeper
Ames Farm
www.amesfarm.com
2425 County Road 127
Delano, MN 55328

Audubon UPPER MISSISSIPPI RIVER | Save Our Sky Blue Waters | CENTER for BIOLOGICAL DIVERSITY | American Bird Conservancy | Zumbro Valley Audubon

To: Senate Agriculture Committee

From: Minnesota Bird Conservation Groups

Subject: **Bird Conservation Groups Support MN SF 3083**

Dear Chair Putnam, Vice Chair Kupec, Ranking Member Westrom, and Senators Anderson, Dahms, Dornink, Gustafson, Kunesh, and Seeberger,

The undersigned groups representing over 100,000 members in Minnesota and millions nationally, write in strong support of SF 3083, A bill for an act
relating to agriculture; adding pesticides from treated seeds to the commissioner's pesticide management plan requirements. Neonicotinoid insecticides present a unique threat to birds in Minnesota and across the country. SF 3083 presents a commonsense approach to limit the impact of these toxic chemicals to birds and other wildlife.

SF3083 would instruct the Minnesota Department of Agriculture to address the ongoing threats posed by neonicotinoids, especially when used as a seed treatment. It would create a program to give growers all information necessary before deciding to use a neonicotinoid seed treatment by requiring a verification of need prior to planting. In real-world cases, verification of need programs have found that fewer than 3% of corn field needed, reducing the use of neonics by 97%.[i]

BACKGROUND

Neonicotinoids are the most widely used systemic insecticides in the country. "Neonics" are deployed both as a spray and a seed coating, whereby they are coated onto a seed before it gets planted in the ground. Neonics are highly toxic in small amounts – a single seed has enough chemical on it to kill a songbird.[ii]

When the seeds are planted, the chemical comes off as dust and can contaminate nearby habitat. The coating also easily sloughs off and contaminates soil and water, killing beneficial non-target insects which are vital as food for birds.[iii]

Neonicotinoid seed coatings typically offer no economic benefit for major row crops.[iv]

The Minnesota Department of Agriculture has found that during the course of regular planting, neonic-coated seeds were spilled and left exposed in 35% of fields studied, and that the deadly active ingredient persisted in soil for as long as 30 days.[v]

IMPACT TO BIRDS

MN DNR studies also challenged the belief that neonicotinoid seed treatments are "safe" for vertebrate wildlife at simulated spills, 16 species of birds were documented consuming seeds at levels high enough to elicit sublethal effects.[vi] Furthermore, laboratory tests on birds are under representative of real-world impacts; for small bodied birds, neonics are much more toxic than other chemicals.[vii]
Coated seeds and non-agricultural applications are also problematic for birds in the way they deplete insect prey resources. Lack of adequate prey leads to generational loss of birds which are not able to have large enough egg clutches or brood sizes.[viii] Minnesota's state bird, the Common Loon, relies on insects, crayfish, and other mollusks, all of which are sensitive to neonicotinoids.[ix]

Neonicotinoid contamination has been recorded in gamebirds in Minnesota including pheasants,[x] grouse, and prairie-chickens, possibly decreasing population sizes and impacting hunting quarry availability for sportspeople.[xi]

Wildlife viewing in the state along brings in over **$620 Million** every year[xii], and nearly 1/3 of all Americans identify as birders, contributing over $250 billion to the United States economy every year.[xiii]

CONCLUSION

As supporters of birds, their habitat, the ecosystem services they provide, and the economic benefits they bring to Minnesota, we strongly support SF 3083 and ask that you favorably report it out of committee.

Sincerely,

American Bird Conservancy
Audubon Upper Mississippi River
Center for Biological Diversity
Save our Sky Blue Waters
Zumbro Valley Audubon Society

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April 21, 2025

Senator Aric Putnam, Chair
Senate Agriculture, Veterans, Broadband, and Rural Development Committee
3215 Minnesota Senate Bldg.
St. Paul, MN 55155

Re: Support for SF 3805

Dear Chair Putnam and Members of the Senate Agriculture, Veterans, Broadband, and Rural Development Committee,

The undersigned 29 groups and our thousands of Minnesota members write in strong support of SF 3083, which will eliminate harmful and unnecessary uses of a class of neurotoxic pesticides called neonicotinoids ("neonics"). Neonics are best known as a leading driver of mass pollinator losses, but their harms are much broader; they pose risks to children's health, degrade soil health, and contaminate waters at levels likely to cause ecosystem-wide harms. Meanwhile, the most widespread uses in Minnesota fail to economically benefit the farmers that use them. SF 3083 takes common-sense steps to rein in these unnecessary uses for the benefit of all Minnesotans.

Neonic contamination in Minnesota is widespread and getting worse. In 2022, the Minnesota Department of Natural Resources (DNR) detected neonics in the bodies of 94% of white-tailed deer tested in the state, up from 61% just two years before. And as detailed in a recent report, neonics are also ubiquitous in Minnesota's waters. Widespread neonic contamination poses serious risks to people and the environment:

- **Neonics hollow out aquatic ecosystems.** They are highly toxic to aquatic invertebrates that fish,[1] birds,[2] and other wildlife rely on for food. For example, they have been implicated as a cause of declines in mayflies that are an important food source for Minnesota's trout.
- **Neonics threaten children's health.** A 2022 study found neonics in the bodies of over 95% of pregnant women tested.[3] Prenatal exposure to these neurotoxins is linked with malformations of the heart and brain, while other studies link neonic exposure with additional neurological, reproductive, and developmental harms.
- **Neonics decimate pollinators like honey bees, wild bees, and butterflies**. They are toxic to bees in extremely low amounts. In fact, a single corn seed treated with a neonic product at approved rates can contain enough pesticide to kill a quarter of a million honey bees. But at even lower levels of exposure, neonics still harm bees' ability to forage, groom, and navigate, making them more susceptible to varroa mite and other threats.[4] As a result of their toxicity to insects, neonics have been identified as a driving factor behind declines in wild bees[5] and midwestern monarch butterflies.[6]
- **Neonics threaten the future of our food systems**. Neonics wipe out pollinators, degrade soil health, and kill pest predators—all of which farmers rely on to grow their crops.
- **Neonics contribute to massive bird declines.** A third of North America's birds have disappeared in the past fifty years, and neonic use has contributed significantly to these declines in recent decades. According to one study, neonic use is linked with a twelve and five percent annual decline in grassland and insect-eating birds, respectively.[7]

Neonic-coated corn and soybean seeds are likely responsible for 90% or more of the neonic contamination entering Minnesota's environment. They are used on nearly all conventional corn and half or more of soybean acres, covering upwards of 12 million acres of neurotoxic neonics each year. Despite their widespread use, studies show that they provide little to no benefit to farmers in many circumstances—especially in corn and soybean in northern states like Minnesota.[8] Equally concerning, MDA has declined to subject treated seeds to common-sense regulations that protect people and the environment from other pesticides.

SF 3083 would, among other important steps, direct the Minnesota Department of Agriculture (MDA) to develop a regulatory program for treated seeds. Critically, it would direct MDA to ensure that pesticide-treated seeds are used only where needed while granting MDA broad discretion to implement such a program in a way that works for Minnesota farmers. It will eliminate the vast majority of neonic contamination by reining in high-cost, low-benefit coated seed uses.

Other jurisdictions are beginning to address the neonic crisis, and Minnesota should be next. In 2019, Quebec, Canada implemented a verification of need program for neonic-treated corn and soybean seeds.[9] The program has successfully reduced neonic contamination while preserving farmer yields—and the province is planning to expand the program to all insecticide seed treatments later this year. New York and Vermont have also passed legislation to rein in unnecessary neonic-treated seed use; those programs will be implemented in the coming years.

It is time for Minnesota's leaders to act—for children, for pollinators, and for the future of Minnesota's food systems. We urge your support for this crucial bill, which takes a common-sense approach to tackling the neonic contamination problem.

Respectfully,

American Bird Conservancy
Audubon Upper Mississippi River
Austin MN Chapter 10 Izaak Walton League of America
Clean River Partners
Clean Water Action
CURE
Environment Minnesota
Environmental Working Group
Friends of Minnesota Scientific and Natural Areas
Institute for Agriculture and Trade Policy
Metro Blooms
Midwest Farmers of Color Collective
Minnesota Center for Environmental Advocacy
Minnesota Division Izaak Walton League of America
Minnesota Environmental Partnership
Minnesota River Valley Audubon Chapter
NRDC Action Fund
Pesticide Action & Agroecology Network
Pollinate Minnesota
Pollinator Friendly Alliance

Renewing the Countryside
Roots Return Heritage Farm
Sierra Club North Star Chapter
Vote Climate
Wes Libbey Northern Lakes Chapter of Izaak Walton League
Wild Farm Alliance
Wild Ones Prairie Edge Chapter
Wild Ones St. Croix Oak Savanna Chapter
Xerces Society for Invertebrate Conservation

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[1] *See, e.g.*, Masumi Yamamuro et al., *Neonicotinoids Disrupt Aquatic Food Webs and Decrease Fishery Yields*, Science (Nov. 1, 2019), https://bit.ly/34rKCSG.

[2] Yijia Li et al., *Neonicotinoids and Decline in Bird Biodiversity in the United States*, Nat. Sustain. (Aug. 10, 2020), https://go.nature.com/2F3MzOu.

[3] Jessie Buckley et al., Exposure to Contemporary and Emerging Chemicals in Commerce among Pregnant Women in the United States: The Environmental influences on Child Health Outcome (ECHO) Program, Environ. Sci. Technol. 56(10), 6560-6579 (2022), https://pubs.acs.org/doi/10.1021/acs.est.1c08942.

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[5] Laura Guzman et al., Impact of pesticide use on wild bee distributions across the United States, *Nat Sustain* 7, 1324–1334 (Aug. 2024), https://doi.org/10.1038/s41893-024-01413-8.

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[7] Yijia Li et al., *Neonicotinoids and Decline in Bird Biodiversity in the United States*, Nat. Sustain. (Aug. 10, 2020), https://go.nature.com/2F3MzOu.

[8] *See, e.g.*, Jocelyn Smith et al., *Quantifying Early Season Pest Injury and Yield Protection of Insecticide Seed Treatments in Corn and Soybean Production in Ontario, Canada*, J. of Econ. Entomology 113(5), 2197-2212 (Oct. 2020), https://bit.ly/3G4GDl3; Jacob Pacenka et al., *IPM Reduces Insecticide Applications by 95% While Maintaining or Enhancing Crop Yields Through Wild Pollinator Conservation*, PNAS 118 (44) (Oct. 25, 2021); Mourtzinis et al., *Neonicotinoid Seed Treatments of Soybean Provide Negligible Benefits to U.S. Farmers*, Scientific Reports 9 (11207) (2019), http://bit.ly/3tvOUH8; Genevieve Labrie, *Impacts of Neonicotinoid Seed Treatments on Soil-Dwelling Pest Populations and Agronomic Parameters in Corn and Soybean in Quebec (Canada)*, PLoS ONE 15(2): e0229136 (2020), http://bit.ly/3g2FDn1.

[9] Louis Robert, Commentary: Québec's experience with pesticide ban offers a glimpse of what New York can expect, *Albany Times Union* (Oct. 2023), available at https://www.timesunion.com/opinion/article/quebec-s-pesticide-ban-experience-previews-n-y-18397410.php.

April 21, 2025

Senator Aric Putnam

Chair of the Senate Committee on Agriculture,
Veterans, Broadband, and Rural Development
95 University Avenue W.
Minnesota Senate Bldg., Room 3215
St. Paul, MN 55155

RE: Testimony of KaZoua Berry, Farmer, in Support of SF3083

Dear Chair Putnam and Members of the Committee:

My name is KaZoua Berry and I am a vegetable and honey bee farmer and I submit the following testimony in strong support of SF3083. My husband and I, along with our four children practice sustainable and regenerative agriculture wherever we grow. For 3 years we grew at Big River Farms, located in Marine on St. Croix, where we farmed organically and also raised bees. 2 years ago, we moved our farm production to Maplewood, where we bought a house and are turning that into our little homestead to continue to grow vegetables and raise bees. We also created an environment that is supportive to other pollinators such as hummingbirds, bumble bees, butterflies, moths, ladybugs, and many other animals.

In 2020, when we were at the beginning of the COVID19 pandemic, we did not have bee keepers and other pollinators come to the farm due to the uncertainty of the disease and we did not know what farming was going to be like that year. We noticed a significant decline of fruit yields and production for both our annual crops and our orchard. My husband and I decided to start raising bees in 2021 and also invited other bee keepers back to the farm and we noticed significant fruit production in 2022.

We raise bees because we know that it is good for our crops and the ecosystem around us and they also provide honey and wax where we can use that as added value for our farm business and our needs of our communities. We know the value of pollination and pollinators, but we also noticed that it's getting harder to keep bees alive due to the nearby environments and the use of pesticides.

This bill isn't only good for pollinators like honeybees, but its also good for protecting the soil and all the organisms that go into creating a healthy and interconnected ecosystem. Have you ever heard of a burying beetle or a sexton beetle? They may seem insignificant, but burying beetles are really important for our ecosystem because they are living decomposers! They help cycle nutrients from dead things and turn it into food for plants, worms, insects, and other animals to thrive. We found a burying beetle hanging out on the tip of our bucket as we were getting ready to plant last season. It's the picture of a beetle that looks like a bumble bee! How does Neonics effect these insects? They overwinter by burying into the soil. Since neonics also contaminates the soil and stays in the soil for years, it poses a risk and endangerment to these insects as well as many other beneficial living things that depends on the health of the soil. They also decompose animals that consume the vegetation and other insects that may have been contaminated by neonics.

All fruits, corn, beans, nuts, grains, coffee, vanilla, cacao beans (chocolate) and many more things that you love to eat requires pollination. Please help us keep the honeybees, burying beetles, pollinators, and all the living creatures that we don't see with our naked eyes alive and create sustainable economic and ecosystem. I do truly believe that we can still practice agronomy and agroecology sustainably without sacrificing people's lives, health, the soil, land, water, animals, and all living things. Please help us protect the future of our food system, forests, lakes, and farms. Thank you for your consideration.

KaZoua Berry

kazouaberry@gmail.com

Figure 1 Burying Beetle

Figure 2 Bumble Bee getting nectar from my Provider Bean Flower at 8am

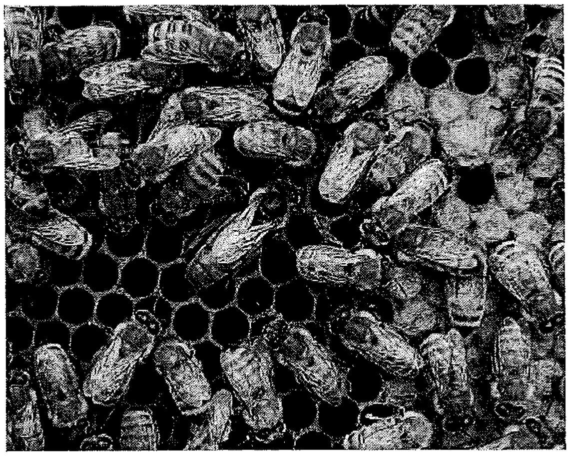
Figure 3 our Honey Bees- Can you spot the Queen?

PennState
College of Agricultural Sciences

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P (814) 865-1895
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April 21, 2025

Senator Aric Putnam, Chair
Agriculture, Veterans, Broadband, and Rural
Development Committee
Minnesota State Senate

Re: Neonicotinoid-Treated Field Crop Seed Use Conflicts with Soil Health, Climate-Smart Agriculture, and Integrated Pest Management—Context for Consideration of SF 3083

Dear Senator Putnam and Committee Members

I write to provide information and context for your consideration of SF 3083. Specifically, I write regarding the relationship of neonicotinoid-coated (i.e., "treated") field crop seeds to soil health, climate-smart agricultural practices, and integrated pest management (IPM)—current use patterns for neonicotinoid-treated corn and soybean seeds contradict all three.

To introduce myself, I am a professor of entomology in the Department of Entomology at the Pennsylvania State University, an extension specialist with Penn State Extension, and State IPM Coordinator and Director of the Pennsylvania IPM program. Much of my work is applied, working directly with farmers on management options for pests in field crops like corn and soybeans. My lab has examined the use of neonicotinoid seed coatings in these crops, and I am well-versed in the extensive academic literature on the subject.

The unequivocal weight of the evidence demonstrates that the **widespread and prophylactic use of neonic treatments on corn and soybean seeds does not provide consistent enough economic benefits to farmers in Northern states.** This is the conclusion of Cornell University's extensive 2020 literature review ("Cornell Report"),[1] which examined over a thousand peer-reviewed papers on neonicotinoids, including multiple field studies representing hundreds of side-by-side North American field trials.[2] Since that time, the evidence for this conclusion has only become stronger.[3] Indeed, over the past decade in Pennsylvania, we have yet to detect an economic advantage to using these neonic-coated seeds.

Regardless, because insecticide-coated corn and soy seeds are deployed irrespective of need—having almost nothing to do with risk from pest populations—the use of these coated seeds has dramatically increased since 2004, with no sign of abating. In the early 1990s, before neonic use, only about 30% of U.S. corn acreage, and only about 2% of soybeans were treated with an insecticide all season. Now, however, we estimate that almost 100% of non-organic corn seed and over half of such soybean seed in the U.S. receives a seed coating. Because these treatments' potential "protection window" lasts a maximum of 2–3 weeks,[4] they are often *in addition* to later season insecticide applications, such as cyhalothrin-lambda or cyfluthrin, which remain as or more common today than before the introduction of seed treatments.[5] Further, about 98% of the insecticides coated on corn seeds are not absorbed by the young plant, but stay in soil where they are subject to leaching and off-target movement.[6]

The unprecedented scale of neonic use on seeds has led to their ubiquity in the environment, contributing to insect declines and creating more toxic agricultural lands[7] in ways that harm the environment and agricultural production directly. A considerable body of evidence now links neonics to loss of bees and other pollinators,[8] as other studies show fruit and vegetable production down because of a lack of pollinators.[9] Research has demonstrated that neonics poison and kill aquatic invertebrates that are vital food sources for fish,[10] birds and other wildlife leading to declines in the abundance and diversity of birds[11] and the collapse of a commercial fishery in Japan.[12]

Near ubiquitous neonic pollution is also in direct conflict with farming for "soil health," which involves improving the amount of life (bacteria, fungi, worms, arthropods, etc.) to better support plant growth. Farmers can foster soil health by reducing or avoiding tillage, planting cover crops, and using a diverse rotation. Many of these practices are the same as those used to capture and store carbon in the soil, and often referred to as "climate smart" agriculture.

Because these same practices also manage pests ostensibly targeted by neonic seed treatments, eliminating prophylactic neonic seed treatment use would likely encourage *more* soil and climate-friendly practices, not less. For example, a 2018 literature review from the USDA Agricultural Research Service recommends practices like no-till and crop rotation to address early-season pests like seedcorn maggot and wireworms.[13] Our own research has found that no-till fields planted with cover crops and managed with no insecticides or IPM had equivalent yields, but tended to have fewer pests than those planted with neonic-treated seeds. Moreover, use of neonic-coated seeds can actually *decrease yields* in some cases.[14] This is because neonic-treated fields have fewer predatory arthropod species that help control pests like slugs, which are not susceptible to neonic insecticides.

Our research has also shown that fields planted with neonic-coated seeds can have fewer decomposing species, like springtails and mites, resulting in slower decomposition,[15] and some newer data that we have collected suggest that fewer decomposers can lead to lower aggregate stability—soil's ability to hold together, a key measurement of "soil health."

It is also important to recognize that use patterns of corn and soybean seed coated with neonic insecticides are also wholly divorced from IPM, which is an approach to managing pests that is based on understanding local pest populations, managing their numbers with a variety of biological and cultural tactics, and relying on insecticides only as last resorts if it makes economic sense. Neonic seed coatings follow the opposite pattern—they are deployed with no regard for insect pest populations or the economics of pest control, which do not support their current use.

Jurisdictions that have prohibited or effectively phased out neonic seed treatments in corn and soybeans do not appear to show reduced yields or lower rates of practices like no-till or cover cropping.[16] These include the European Union, which banned such treatments in 2013, and Ontario and Québec, which have cold climates similar to Minnesota. Indeed, in Québec, where farmers may still use neonic-treated seeds with a valid "prescription" from a state-certified agronomist, use rates continue to drop year over year—falling from near 100% use on corn seed and 50% on soybean seed in 2015 to less than 0.5% on corn and 0% on soybean in 2021, the most recent year for which data is available[17]—in an apparent real-world example of what the scientific research shows.

In summary, current use of neonics as seed coatings on corn and soybean seeds is inefficient, ineffective, divorced from IPM, and more harmful to non-target insect populations than any benefits gained from pest control. Further, neonic-coated seeds limit soil health, at least by our measures, and appear to negatively influence non-target insect populations in crop fields and habitats near, or even far from, crop fields. If farmers are interested in "climate-smart" agriculture, IPM, or developing soil health to its fullest, the research indicates they should limit insecticide use, neonics or otherwise.

Thank you for considering the details in this letter.

Sincerely,

John Tooker
Professor / Extension Specialist
tooker@psu.edu

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Testimony to support Bill #SF3083: Develop pesticide management plan for pesticide-treated seed.

To: Senator Aric Putnam, Chair of Agriculture, Veterans, Broadband, and Rural Development Committee

Date: April 17, 2025

I write today as an angler concerned about neonic treated seeds and to express strong support of SF 3083 which will eliminate harmful and unnecessary uses of neonicotinoid treated seeds

As an angler I am concerned about neonic treated seeds because there has been a significant degradation of water quality in Southeast Minnesota, and Neonicotinoids are a major factor contributing to this problem. Having been born and raised in MN I have seen a dramatic decline in aquatic insect life during my 50 years fishing Minnesota trout streams. In the 1960-70's we saw the unintended catastrophic negative effects of the insecticide DDT on the environment which has taken decades to recover from. We must act now and responsibly regulate Neonicotinoid insecticides to avoid a similar disaster.

Neonics are highly toxic to aquatic invertebrates that form the base of aquatic food webs. MDA's own data show "elevated and concerning" neonic concentrations in Minnesota's surface waters. Levels routinely exceed the U.S. Environmental Protection Agency's chronic aquatic life benchmark (ALB) for harm to aquatic invertebrates. MDA concluded that its analysis strongly suggests that clothianidin and imidacloprid concentrations over the EPA's chronic ALB are sustained for periods more than 21 days in rivers and streams across western and southern Minnesota." These elevated neonic concentrations are correlated with corn and soybean planting season, which "strongly suggests that neonicotinoids from seed treatments are the primary source of detections and are rapidly transported to rivers and streams after planting."

Neonics are "systemic," meaning they are water soluble, and long lasting. This allows them to rapidly contaminate surface and groundwater and stick around for up to three years. Recent research in Minnesota showed neonics in 97% of water samples from rivers and streams, and 74% of groundwater samples, including at levels above the tolerance level of aquatic insects. Data collected by MDA confirms that neonic-treated seeds are the leading source of harmful neonic contamination in Minnesota waters. Highest levels are detected in May, June and July and following the agricultural crop planting season.

MDA's current approach to pesticide-treated seeds is failing to protect Minnesota's trout streams and waterways from the harms of neonicotinoid contamination and legislation is needed to monitor and regulate them. We urge you to stand up for all Minnesotans and take swift action to address this crisis.

Thank you.

Anthony Stans

1039 Weatherhill Lane SW

Rochester, MN 55902

Dear Senator Aric Putnam, Chair of Agriculture, Veterans, Broadband, and Rural Development Committee,

I write today as an angler concerned about neonic treated seeds and to express strong support of SF 3083 which will eliminate harmful and unnecessary uses of neonicotinoid treated seeds
As an angler I am concerned about neonic treated seeds because the contaminants released into our surface and groundwater may be negatively affecting aquatic life. This is unacceptable.
As a biologist and aquatic contaminant specialist much of my career I am still saddened to see how big businesses can insert another harmful contaminant into the environment. This has got to stop! Please regulate these chemicals to prevent harm to the aquatic life and humans, too.
Neonics are highly toxic to aquatic invertebrates that form the base of aquatic food webs. MDA's own data show "elevated and concerning" neonic concentrations in Minnesota's surface waters. Levels routinely exceed the U.S. Environmental Protection Agency's chronic aquatic life benchmark (ALB) for harm to aquatic invertebrates. MDA concluded that its analysis strongly suggests that clothianidin and imidacloprid concentrations over the EPA's chronic ALB are sustained for periods more than 21 days in rivers and streams across western and southern Minnesota." These elevated neonic concentrations are correlated with corn and soybean planting season, which "strongly suggests that neonicotinoids from seed treatments are the primary source of detections and are rapidly transported to rivers and streams after planting."
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MDA's current approach to pesticide-treated seeds is failing to protect Minnesota's trout streams and waterways from the harms of neonicotinoid contamination and legislation is needed to monitor and regulate them. We urge you to stand up for all Minnesotans and take swift action to address this crisis.

Thank you.

Bradley Frazier

1323 Highland Pl

Faribault, MN 55021

Date: April 17, 2025

Dear Senators Putnam, McEwen, Kunesh, Johnson Stewart, Marty and members of the committee,

My name is Lee Stoe. I'm a member of Minnesota Trout Unlimited, and I've been fly fishing Minnesota's streams for over 30 years. I strongly support SF 3083. My support is rooted in knowing, and seeing firsthand, the impacts of neonics on stream health. During my many years on the stream, I have seen a significant decline in insect hatches. Many fly fishers in my circles tell me how they have also noticed a significant decline in the number and intensity of insect hatches on the stream. Trout depend upon these hatches for food, and therefore, survival. Minnesota's trout are threatened by our largely unregulated use of neonicotinoids.

Trout are an indicator species, and we need to pay attention and take action when we see their survival being threatened. When we find neonics in the stream water, there is little doubt that neonics are also present in our drinking water, especially in private wells and especially those within the ecologically fragile Driftless Region of SE Minnesota with its Karst geology. SF 3083 is a double win: one for the fish and two for our citizens.

SF 3083 provides critical measures to strengthen monitoring and accountability for dangerous neonicotinoids, directing actions to stem further stream and drinking-water contamination.

One piece of SF 3083 that I feel is critical is the requirement to demonstrate the need before applying neonicotinoids. This amounts to a subscription of sorts. This can also be a win for farmers who pay for seed treatments. Why should they pay for unnecessary seed treatments? This piece of SF 3083 limits the use of highly mobile neonics, thereby minimizing the amount traveling through our steams and helps safeguard our drinking water.

Please support this bill to prevent further degradation of our streams and drinking water supply, and safeguard Minnesota's fishing heritage for future generations.

Respectfully submitted,

Lee Stoe
13826 Eveleth Court
Apple Valley, MN 55124

Dear Sen. Aric Putnam and Committee Members:

I am a member of Trout Unlimited and an avid fly fisherman. The food supply for trout is aquatic insects and in recent years, the size of insect hatches on Minnesota trout streams has dropped precipitously.

I am writing to support the administrative petition calling on your agency to take action to address widespread contamination of Minnesota's environment by neonicotinoid pesticides ("neonics") which are highly toxic to aquatic insects. These elevated neonic concentrations are correlated with corn and soybean planting season, which strongly suggests that neonicotinoids from seed treatments are rapidly transported to rivers and streams after planting.

Recent research in Minnesota showed 97% of water samples from streams, and 74% of groundwater samples, had neonics above the tolerance level of aquatic insects. Data collected by MDA confirms that neonic-treated seeds are the leading source of harmful neonic contamination in Minnesota waters.

MDA's current approach to pesticide-treated seeds is failing to protect Minnesota's trout streams from the harms of neonicotinoid contamination and I urge you to take action.

Thank you for considering my letter.

Sincerely,
Joe Maccani
9540 Yosemite Rd.
Bloomington, MN 55437

Testimony to support Bill #SF3083: Develop pesticide management plan for pesticide-treated seed.

To: Senator Aric Putnam, Chair of Agriculture, Veterans, Broadband, and Rural Development Committee
Date: April 17, 2025

I write today as an angler and outdoor enthusiast concerned about neonic-treated seeds and to express strong support for SF 3083, which will eliminate harmful and unnecessary uses of neonicotinoid-treated seeds

As an angler, I am concerned about neonic-treated seeds because the impacts to the smallest, most sensitive insects will cause the greater ecosystem to come apart. Fish, pheasant chicks, bats - all harmed by these chemicals.

Neonics are highly toxic to aquatic invertebrates that form the base of aquatic food webs. MDA's own data show "elevated and concerning" neonic concentrations in Minnesota's surface waters. Levels routinely exceed the U.S. Environmental Protection Agency's chronic aquatic life benchmark (ALB) for harm to aquatic invertebrates. MDA concluded that its analysis strongly suggests that clothianidin and imidacloprid concentrations over the EPA's chronic ALB are sustained for periods more than 21 days in rivers and streams across western and southern Minnesota." These elevated neonic concentrations are correlated with corn and soybean planting season, which "strongly suggests that neonicotinoids from seed treatments are the primary source of detections and are rapidly transported to rivers and streams after planting."

Neonics are "systemic," meaning they are water soluble and long-lasting. This allows them to rapidly contaminate surface and groundwater and stick around for up to three years. Recent research in Minnesota showed neonics in 97% of water samples from rivers and streams, and 74% of groundwater samples, including at levels above the tolerance level of aquatic insects. Data collected by MDA confirms that neonic-treated seeds are the leading source of harmful neonic contamination in Minnesota waters. Highest levels are detected in May, June and July and following the agricultural crop planting season.

MDA's current approach to pesticide-treated seeds is failing to protect Minnesota's trout streams and waterways from the harms of neonicotinoid contamination and legislation is needed to monitor and regulate them. We urge you to stand up for all Minnesotans and take swift action to address this crisis.

Thank you.
Megen Kabele
La Crescent, MN

TESTIMONY OF MICHAEL D. MADIGAN

April 18, 2025

Good Afternoon Chair Putnam and Senators:

My name is Michael Madigan. I reside at 2366 Hidden Lake Cove, Woodbury, MN. I am the Treasurer and a member of the State Council of Minnesota Trout Unlimited. Thank you for the opportunity to address the Committee regarding neonicotinoids and their detrimental impact on coldwater ecosystems.

As other speakers have noted, we are experiencing an alarming decline in pollinators. Honeybee officials are raising the alarm about severe colony losses in 2024 and 2025. The extent of the bee deaths is still being tallied, but one estimate suggests more than a million colonies have died nationwide. There has been a massive die off of bees this year. In addition, butterflies and other pollinators have suffered similar die-offs. Those of us with a few grey hairs have witnessed in our lifetime the dramatic decline in Monarch populations.

But I would like to address the less well-known decline in aquatic insects and the detrimental impact on Minnesota's coldwater ecosystems. Statewide, there are more than 3,800 miles of trout streams, with more than 700 miles in southeastern Minnesota alone. These are rare and precious resources. Trout fishing in Minnesota contributes significantly to the state's economy, with an estimated impact of $1.6 billion annually in the Driftless Region alone. Trout streams are fragile due to their sensitivity to environmental changes and the potential impact of human activities. Trout as a cold-water species, have specific habitat requirements, making them vulnerable to issues like increased water temperatures, pollution, and habitat degradation. In particular, trout streams are susceptible to various forms of pollution, including agricultural runoff, industrial discharge, and sewage contamination, which can harm their health and reproductive success.

As with pollinators, we have recently seen a dramatic decline in aquatic insect populations. I have fished for trout for over 50 years. Our trout streams used to experience regular and heavy hatches of mayflies, caddis flies, and other aquatic insects, particularly in the driftless area. In just the last 20 years, hatches of Hendricksons, Hexes, and the Mother Day's caddis, as well as other mayflies have become far more sparse or nonexistent. This decline is a result of several factors but the use of synthetic pesticides, such as neonicotinoids, has been a major driver. Neonicotinoids or "neonics" are the most commonly used insecticides nationwide and likely the most ecologically harmful pesticides since DDT. Prior to being banned, many of us will remember how DDT had a devastating effect on bird, fish, and other aquatic life populations, in particular eagles and other raptors.

Neonics are ubiquitous in farm country. They are water soluble, and long lasting. They rapidly contaminate surface and groundwater and remain for up to three years. Recent research in Minnesota showed neonics in 97% of water samples from rivers and streams, and 74% of groundwater samples, including at levels above the tolerance level of aquatic insects. Data collected by the Minesota Department of Agriculture confirms that neonic-treated seeds are the leading source of harmful neonic contamination in Minnesota waters. The highest levels are detected in May, June and July and following the agricultural crop planting season.

The Minnesota Department of Agriculture does not regulate treated seeds. Most of the corn and soybean seeds sold in Minnesota are treated with neonics but escape regulation. When neonics are applied to seeds, they can be absorbed by the plant as it grows, providing systemic protection against insect pests. However, most of these chemicals are not absorbed by the plants. Typically, less than 10% is absorbed, leaving over 90% on the surface of the seeds or in the surrounding soil. When it rains or when irrigation water is applied, these surface residues can be washed off the treated seeds and soil and into nearby streams and water bodies. MDA water samples have shown spikes in neonics following rainfall-runoff events.

I am not insensitive to the challenges faced today by Minnesota farmers. Growing up, about half of our family were dairy farmers and I spent a good part of my youth on a farm. But Neonics make no economic sense. Neonic treated seeds have not been shown to offer any overall economic benefit to farmers compared to untreated seeds. The increased cost of treated seeds is greater than any marginal increase yield. Additionally, use of neonic on lawns and gardens is unnecessary.

The Department of Agriculture has steadfastly refused to regulate these harmful pesticides although its own studies have documented the environmental damage being done by neonics. Regulating these chemicals is long overdue and can be accomplished without damaging our farmers. 12 states have already done so and others are currently debating the topic. I would respectfully urge this Committee and the Legislature to enact legislation regulating these harmful pesticides in order to protect threatened pollinator and aquatic insect populations. Thank you for your time and consideration.

April 21, 2025

Chair Aric Putnam, Chair
Agriculture, Veterans, Broadband, and Rural Development Committee
Minnesota Senate
95 University Avenue W.
Minnesota Senate Bldg., Room 3215
St. Paul, MN 55155

Testimony of Louis Robert, Former Agronomist at the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ), and Dr. Geneviève Labrie, PhD, Research Associate, Université du Québec à Montréal (UQAM)

Dear Chair Putnam and Members of the Committee:

The undersigned individuals provide the following testimony regarding our experience with neonicotinoid-treated corn and soybean seeds in Québec, the science regarding their lack of benefit to farmers, and our personal experience with industry interference in exposing the truth of that science.

Louis Robert is an agronomist and grain crops specialist, who worked with the Department of Agriculture[1] in the Province of Québec, Canada, for 33 years. Dr. Geneviève Labrie, PhD, is a researcher affiliate with Université du Québec à Montréal in Québec, Canada. Dr. Labrie has published extensively on the subject of crop pests and pest control methods.

The Experience in Québec and the Science Regarding Neonicotinoid-Treated Seeds

As of April, 2019, the Department of Environment of the Province of Québec made it mandatory for anyone wishing to use neonicotinoids to produce a written recommendation from one of the Province's 3,300 registered agronomists. In its pre-bylaw consultations, the Department had made it clear that the use of those chemicals would be restricted, based on their proven acute toxicity to the environment and public health concerns. Before these restrictions, the vast majority (80-90 %) of the corn, soybean, and canola acreage (approximately 2 million acres) in Québec were planted with seed coated with the neonicotinoids clothianidin, imidacloprid, or thiamethoxam. Residues of any one or combinations of those molecules were detected in significant concentrations in over 90% of samples collected in rivers and streams being monitored by the Department.

This "verification of need" requirement resulted in substantial reduction in use of neonic-treated seeds. The seed suppliers reacted very swiftly to this regulatory change, having seen it coming. As soon as 2019, most corn and soybean seeds used in Québec were no longer carrying any neonicotinoids. (All corn seed and a major part of the soybean seed sold in Québec is grown in Ontario or the U.S. Midwest). Surveys from the Department of Environment report Québec

[1] Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec- MAPAQ.

farmers used neonicotinoids on about .2% of their fields in 2020, and as little as 0.003 % in 2023[2,3]. As a result, neonicotinoid contamination of surface waters decreased significantly.

Prior to those regulatory initiatives, word had already spread around that insecticide-treated seeds may not bring any advantages to Québec farmers, at least among crop advisers and top cash croppers. Dr. Labrie led a large research project carried out from 2012 through 2016 (5 cropping seasons) in 7 different regions, which found no significant difference in yield between plots with treated and untreated seeds. This result held for both corn and soybean (see attached study). Thanks to continued public funding, the network was expanded to just short of 1000 sites, with no difference in the results or conclusions whatsoever.

Dr. Labrie's findings are consistent with other studies conducted in the U.S. and Canada. For example, Pacenka et al. (2021) found in another four-year Purdue University study that "the absence of a neonicotinoid [corn] seed treatment had no impact on yields." Smith et al. (2020) concluded after a 4-year study of 160 corn and soybean fields in Ontario "that widespread use of seed-applied insecticides in corn and soybean is unlikely to provide benefit to producers." Mourtzinis et al. (2019) found that "despite widespread use," neonic seed treatments in soybean "appear[] to have little benefit for most of soybean producers." Krupke et al. (2017) found that three years of field studies in Indiana "failed to demonstrate a significant benefit of planting treated maize seeds." The U.S. Environmental Protection Agency found as long ago as 2014 that "these seed treatments provide negligible overall benefits to soybean production in most situations. Published data indicate that in most cases there is no difference in soybean yield when soybean seed was treated with neonicotinoids versus not receiving any insect control treatment." Each supports the conclusion that neonic seed treatments in corn and soybean often provide no benefit to farmers, but instead serve as unnecessary (but paid) insurance that contaminates whole ecosystems with harmful pesticides.

Substitution of Diamides for Neonics

After Québec imposed "verification of need" requirements for neonicotinoids in 2019, many farmers switched to seeds treated with another class of insecticides, the diamides (cyantraniliprole, chlorantraniliprole). Seed company officials stated that in 2021, at least 60% of the corn fields were planted with diamide-coated seed. However, this still marks a considerable decrease in the total use of insecticide-treated seeds from the period before the neonicotinoid restrictions took effect. While diamides are not as dangerous as neonics in some ways, they pose some of the same risks as neonics. They are equally persistent and water soluble, and are extremely toxic to butterflies. Their occurrence in rivers and streams shows an exponential increase since they were first introduced on the market. They now reach toxicity thresholds for benthic arthropods [3,4].

But Dr. Labrie's research suggests that diamides are no more useful to farmers than neonicotinoid-treated seeds. Neonicotinoids were the active ingredients in all trials, but the fact that the non-treated plots did not yield less than the treated ones (despite the presence of significantly more targeted insects) made it clear that the conclusions would hold true for any class of insecticides. Higher pest presence did not decrease yield, so insecticide use was not necessary at all. The Dept

[2] Ministère de L'Environnemnet et de la Lutte Contre Les Changements Climatiques, *Bilan des Ventes de Pesticides Au Québec* (2020), https://bit.ly/3ZnhNUd.

3 Ministère de L'Environnemnet et de la Lutte Contre Les Changements Climatiques, *Bilan des Ventes de Pesticides Au Québec* (2023). https://cdn-contenu.quebec.ca/cdn-contenu/environnement/pesticides/bilan-ventes-pesticides-quebec.pdf

of Environment keeps pace: in November 2024 they announced that the verification of need requirement will be extended to all seed insecticides by August 2025[5].

Since the neonicotinoid regulations were implemented in the Province and other research has emerged, farmers, agronomists, as well as the general public are much more aware of the risks of insecticide-treated seeds from an environmental and public health standpoint as well as their uselessness. An in-house survey of suppliers, farmers, and agronomists last February (after most seed had been purchased) lead us to believe that more than 60 % of the corn will not carry any insecticide in 2025. As such, we believe the use of all seed applied pesticides (insecticides and fungicides) will be further reduced in the coming seasons. Last year Quebec corn growers harvested a bumper crop, adding yet further support for the shift towards less pesticides. Of course, farmers themselves are the ones benefiting the most from a reduction of risks associated with direct exposure to toxic compounds. In addition to paying 5 to 10 $ less for a bag of seed.

Personal Experience with Industry Interference with Research

On January 24th, 2019, Mr. Robert was fired for having leaked (in March 2018) an internal memo to the press. In that memo, Mr. Robert warned the deputy minister of the interference that the industry exerted its influence to prevent the publication of public funded research that showed no advantages from the use of neonicotinoids. His firing sparked a cascade of news reports in various medias and the installment of an official inquiry by the inspector general of Quebec. The report issued June 2019 publicly cleared him: in the months and years prior to going to the media, he had gone through (unsuccessfully) all the appropriate procedures detailed in the Whistleblowers Act[63] of May, 2017, and was fully in his right in going to the press.

Official apologies from the Minister (Secretary) André Lamontagne and Prime Minister François Legault shortly followed, along with full compensation and his re-installment at his position, on August 6th, 2019.

He carried on his duties at MAPAQ until his retirement in 2023. Since the time that he initially leaked the memo, the science has only grown stronger that seeds treated with neonicotinoids provide no benefits to Québec farmers.

Dr. Labrie faced significant pressure from the industry as well as from the research center's board of directors where she worked. She was forced to leave her position in 2017 due to relentless pressure, along with five out of the seven researchers on her team. They had just been banned from publishing any scientific research. Upon leaving the research center, Dr. Labrie was also required to leave behind all of her data. In 2019, she requested copyright over the data from the Quebec government, and in 2020, she published the results of her research in the journal *PLOS One*, with the support of her colleagues who had also left the research center. An investigation by the Québec Ombudsman concluded that the research center, while obstructing Dr. Labrie's research: (1) seriously breached ethical and professional standards, (2) misused public funds, and (3) was guilty of mismanagement within a public institution. Following this report, corrective measures were

[4] GIROUX, I. (2022). *Présence de pesticides dans l'eau au Québec : Portrait et tendances dans les zones de maïs et de soya – 2018 à 2020*, Québec, ministère de l'Environnement et de la Lutte contre les changements climatiques, Direction de la qualité des milieux aquatiques, 71 p. + 15 ann.<

[5] Gazette officielle du Québec. https://www.publicationsduquebec.gouv.qc.ca/fileadmin/gazette/pdf_encrypte/lois_reglements/2023F/80044.pdf

[6] Loi facilitant la divulgation d'actes répréhensibles à l'égard des organismes publics.

[7] https://console.vpaper.ca/protecteur-du-citoyen/rapport_annuel_2023/page/102/#102/

implemented to improve governance and research ethics standards across all semi-public agricultural research centers in Quebec.[7]

Sincerely,

/s/ Louis Robert	/s/ Genevieve Labrie
Louis Robert, agronomist	Dr. Genevieve Labrie, PhD

Minnesota Senate
Committee on Agriculture, Veterans, Broadband, and Rural Development

Written Testimony in Support of Senate File 3038
Regulating Pesticide-Treated Seed
April 18th, 2025

Dear Chair Putnam, Vice Chair Kupec, Ranking Member Westrom, and all Honorable Members:

The Xerces Society is an international nonprofit that uses science-driven methods to protect invertebrate wildlife and their habitat. Recognized as a global leader in pollinator conservation by entities such as the U.N. Food and Agriculture Organization and USDA-NRCS, we work directly with farmers in Minnesota and across the U.S. to safeguard pollinator populations. **We support SF-3038 because it would bring about meaningful regulatory changes that curb the excessive use of neonicotinoid insecticides**, which are directly linked to pollinator declines and other ecological harms.

Neonicotinoids ("neonics") are a class of synthetic nicotine-like neurotoxic pesticides which are broadly toxic to insects.They first came on the market in the 1990s and are now the most commonly used insecticides in the US. The Xerces Society has reported on the negative effects of neonicotinoids on pollinator populations for many years.[1] Neonics have a combination of characteristics that make them particularly dangerous for pollinators. In addition to being highly toxic to bees and other beneficial insects, neonics are systemic. This means the insecticide is absorbed by the plant and expressed in all tissues of the plant, including the pollen and nectar that bees rely on for food. **Even trace amounts in nectar and pollen can cause harm to bee health and reproduction.**

Neonics are the most common type of insecticide applied as a coating / treatment on crop seeds, and this delivery method is also the single greatest source of neonicotinoid use in the nation. Insecticide-treated seeds are used to grow nearly all corn and the majority of soybeans planted across roughly 148 million acres in the Midwest. They are also used in a variety of other crops, including wheat, sugar beets, squash, sorghum, sunflowers, and many more.

Seed treatments are a particularly pernicious use of neonicotinoids because crops are being treated not in response to a pest threat, but as "insurance." Because less than 5% of seed treatments are absorbed by the plant, most of the active ingredient escapes into soil and water. Neonicotinoids degrade slowly and can persist in soil for months to years after application. As a result, the prophylactic use of neonic-treated seeds has led to widespread contamination that is detrimental to pollinators, other wildlife, and ecosystem health.

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[1] Hopwood et al. (2016) How Neonicotinoids Can Kill Bees. Xerces Society. https://xerces.org/publications/scientific-reports/how-neonicotinoids-can-kill-bees

The ecological harms of neonicotinoid overuse are well documented. At the same time, the economic benefits of insecticide seed treatments have been called into question. In 2019, Québec restricted the use of neonic-treated seeds by requiring a "prescription" from an agronomist, ensuring that treated seed is used only where pests are present at economically damaging thresholds. Since that time, research from Québec has shown that neonicotinoid seed treatments are useful in less than 5% of fields (Labrie et al. 2020) and a growing number of studies are calling into question the efficacy of insecticide seed treatments on soy and cereal crops (EPA 2014; Milosavlijevic et al. 2019; Bekelja et al. 2023). This means vast land areas are being treated annually in Minnesota without cause, and producers are being sold seeds with pesticides that they do not need.

It's not just the bees and butterflies that are at risk. **We know that the overuse of pesticides is degrading aquatic ecosystems and harming bird populations.** In the Midwest, neonicotinoid insecticides are present in waterways throughout the year, often at levels that pose risk to aquatic species (Hladik et al. 2018; Schepker et al. 2020; Kuechle et al. 2022). Elevated pulses of neonicotinoids have been documented in waterways after crop planting with treated seeds (Hladik et al. 2014; Berens et al. 2021). **Neonics commonly used as seed treatments are also turning up in Minnesota's white-tailed deer at concerning rates and concentrations.** In 2019, DNR surveyed free-ranging white-tailed deer and found imidacloprid in 61% of deer spleens, which rose to 94% in 2021. Two thirds of the deer tested by Minnesota's DNR in 2021 had levels that exceeded a risk threshold for increased fawn mortality (Berheim et al. 2019).

We thank your committee and the Minnesota legislature for passing bills in 2023 to address challenges that pollinators face, e.g., regulating pollinator-friendly labels on nursery plants (HF1497 / SF1130) and directing MPCA to develop rules for the proper disposal of "waste" pesticide-treated seeds (HF1317 / SF1339).

For your reference, we are providing, in addition to this letter, the public comments that Xerces and American Bird Conservancy submitted to the EPA in response to their 2023 Advanced Notice of Public Rule-Making (ANPRM) regarding possible regulations for pesticide-treated seed. This letter lays out why current regulation of treated seeds is woefully inadequate and what we need to do to improve safety and oversight.

We hope your committee will support the contents of SF-3083 going forward. Thank you for your time and consideration. Please reach out with any questions you may have.

Sincerely,

Rosemary L Malfi

Rosemary Malfi, Ph.D.
Director of Conservation Policy
rosemary.malfi@xerces.org

References:

Bekelja, K. et al. (2023). Removing neonicotinoid seed treatments has negligible effects on refuge function and crop protection in transgenic maize targeting western corn rootworm (Coleoptera: Chrysomelidae). *Journal of Economic Entomology*, *116*(3), 823–834.

Berens, M. J. et al. (2021). Neonicotinoid Insecticides in Surface Water, Groundwater, and Wastewater Across Land-Use Gradients and Potential Effects. *Environmental Toxicology & Chemistry*, *40*(4), 1017-1033.

Berheim, E. H. et al. (2019). Effects of neonicotinoid insecticides on physiology and reproductive characteristics of captive female and fawn white tailed deer. *Scientific Reports*, *9*. https://www.nature.com/articles/s41598-019-40994-9

Environmental Protection Agency (EPA), Office of Chemical Safety and Pollution Prevention, Biological and Economic Analysis Division. (2014, October 3). Benefits of Neonicotinoid Seed Treatments to Soybean Production.

Hladik, M. L. et al. (2018). Year-round presence of neonicotinoid insecticides in tributaries to the Great Lakes, USA. *Environmental Pollution*, *235*, 1022-1029. 10.1016/j.envpol.2018.01.013

Kuechle, K. J., et al. (2022). Seed treatments containing neonicotinoids and fungicides reduce aquatic insect richness and abundance in midwestern USA-managed floodplain wetlands. Environmental Science and Pollution Research International, 29(30), 45261–45275.

Labrie, G., Gagnon, A.-È., Vanasse, A., Latraverse, A., and Tremblay, G. 2020. Impacts of neonicotinoid seed treatments on soil-dwelling pest populations and agronomic parameters in corn and soybean in Quebec (Canada). *PloS One*, *15*(2), e0229136. https://doi.org/10.1371/journal.pone.0229136

Milosavlijevic, I. (2019). Effects of imidacloprid seed treatments on crop yields and economic returns of cereal crops. *Crop Protection*, *119*, 166-171. https://doi.org/10.1016/j.cropro.2019.01.027

Schepker, T. J. et al. (2020). Neonicotinoid insecticide concentrations in agricultural wetlands and associations with aquatic invertebrate communities. *Agriculture, Ecosystems, and Environment*, *287*, 106678. https://doi.org/10.1016/j.agee.2019.106678

Additional (Quicker) Reading from Xerces:

Hoyle, S. & Code, A. (2021) Insecticide Seed Treatments Threaten Midwestern Waterways. Xerces Fact Sheet.
https://xerces.org/publications/fact-sheets/insecticide-seed-treatments-threaten-midwestern-waterways

Hopwood, J. et al. (2016) How neonicotinoids kill bees. Xerces Scientific Report.
https://xerces.org/publications/scientific-reports/how-neonicotinoids-can-kill-bees

Malfi, R. (May 2024) What we can learn from Quebec's success with regulating pesticide-treated seed. Xerces Blog.
https://www.xerces.org/blog/what-we-can-learn-from-quebecs-success-with-regulating-pesticide-treated-seed

Susan Bartow
Chemical Review Manager
Pesticide Revaluation Division,
Office of Chemical Safety and Pollution Prevention
Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, DC 20460

Date: February 8th, 2024

Subject: Comment on EPA-HQ-OPP-2023-0420

Dear Ms. Bartow,

American Bird Conservancy and The Xerces Society for Invertebrate Conservation respectfully submit these comments on the Review of Requirements Applicable to Treated Seed and Treated Paint Products, EPA-HQ-OPP-2023-0420.

We thank the Environmental Protection Agency (EPA) for opening this Advanced Notice of Proposed Rulemaking (ANPRM). Our comments will principally apply to pesticide-treated seed. We recognize that this ANPRM has been many years in the making and appreciate the Agency's willingness to engage with stakeholders before issuing rules. We offer our thoughts below.

Background: Pesticide-Treated Seed Risks and Impacts

Pesticide-treated seeds are one of the most commonly employed methods of pesticide application. As many as 156.64 million acres of corn, soybean, and cotton acres were planted with insecticide and fungicide seed treatments in 2023.[1] Estimates from 2012 put wheat seed treatment levels at anywhere between 46-57%[2] and that value is likely to be higher today. Seed treatments, including insecticides, are also approved for use in a wide variety of other crops, such as sugar beets, squash, sorghum, sunflowers, and many more. The extent of use in these other crops is currently unknown because this information is not collected by federal or state agencies, but could account for millions more acres beyond the estimated use in corn, soybean, and cotton.

A petition sent to the EPA in 2017, which was subsequently denied in 2022, stated that EPA does not sufficiently assess risks from the use of pesticide-coated seeds and that the treated article exemption under 40 C.F.R. § 152.25(a) should not apply to pesticide-coated seeds. EPA's response stated that seed treatments are adequately assessed when the active ingredient coating is registered or reviewed. We

[1] EPA spokesperson statement to Missouri Independent. Hettinger, J. 7/27/2023. https://missouriindependent.com/2023/07/27/epa-says-three-widely-used-pesticides-driving-hundreds-of-endangered-species-toward-extinction/

[2] Kynetec. 2019. AgroTrak Survey. Kynetec Group, Newbury, United Kingdom. https://www.kynetec.com/solutions/agriculture

concur with the petitioners that this approach is insufficient because it fails to account for all real-world/in-field impacts of seed treatments. Real-world use data is often called into consideration during registration review for an active ingredient, but as EPA and many groups have pointed out, due to a lack of usage data the true scope and geography of seed treatment use is impossible to know.

Contamination from pesticides used as seed treatments is widespread.

Academic research and reports indicate that environmental contamination from active ingredients used as seed treatments is widespread (Bonmatin et al. 2015; Botias et al. 2016). In the Midwest, neonicotinoid insecticides are present in waterways throughout the year, often at levels that pose risk to aquatic species (Hladik et al. 2018a; Schepker et al. 2020). Studies have also found elevated pulses of neonicotinoids in waterways during crop planting, attributed to seed treatments (Hladik et al. 2014; Berens et al. 2021). The state of California has profoundly elevated levels of common neonicotinoid seed treatments in its waterways.[3] [4] Higher concentrations of neonicotinoids in water and sediment after the planting of treated seeds in Missouri floodplains were associated with a decrease in aquatic insect richness and abundance (Kuechle et al. 2022).

Neonicotinoids used as seed treatments are also turning up in wild animal populations at concerning rates and concentrations, demonstrating their pervasiveness in the environment. In 2019, Minnesota's Department of Natural Resources surveyed free-ranging white-tailed deer for neonicotinoids and found imidacloprid in 61 percent of 799 deer spleens tested. That percentage rose to 94% (n = 496) in 2021. Imidacloprid has been found to negatively affect white-tailed deer (*Odocoileus virginianus*) when administered at field-relevant doses. Increasing levels in deer spleens have been associated with greater lethargy and decreased fawn survival, jawbone length, body weight, and organ weight (Berheim et al. 2019). *Two thirds* of the deer tested by Minnesota's DNR in 2021 had levels that exceeded a risk threshold for increased fawn mortality (Berheim et al. 2019). Neonicotinoids are also being found in pheasants, possibly owing to contaminated forage[5], which can have harmful effects at high levels (Sundall 2020).

Prolific research demonstrates harm from systemic insecticides used as seed treatments.

It is well-established that chronic exposure to the levels of neonicotinoids found in contaminated forage and soils in and near agricultural crops negatively affects bee health (Tsvetkov et al. 2017; Wintermantel et al. 2018) and reproductive success (Sandrock et al. 2014; Rundlof et al. 2015; Stuligross & Williams 2021), ultimately leading to population declines and biodiversity loss (Woodcock et al. 2016). Because active ingredients like neonicotinoids are persistent in soil, flowering plants on field margins, in adjacent prairie strips, or in catchment areas can be contaminated with residues that affect pollinator health and species richness (Botias et al. 2015; Botias et al. 2016; David et al. 2016; Main et al. 2020; Mogren & Lundgren 2016). For ground-dwelling bees, direct contact with contaminated soil can be an additional route of exposure (Raine & Rundlof 2024).

Pollinators are at risk of acute poisoning from toxic dust produced during planting of treated seeds (Bonmatin et al. 2015; Lentola et al. 2020). Other important arthropods are also affected: the contamination of soils from dust-off and leaching of neonicotinoid seed treatments disturbs soil

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[3] California DPR Surface Water Database, https://www.cdpr.ca.gov/docs/emon/surfwtr/surfcont.htm

[4] Xerces Society's report: https://www.xerces.org/publications/scientific-reports/neonicotinoids-in-californias-surface-waters

[5] Daley, J. (2019, April 30). As pesticides turn up in more places, safety concerns mount. Scientific American: Environment. https://www.scientificamerican.com/article/as-pesticide-turns-up-in-more-places-safety-concerns-mount/

arthropod communities that play important roles in decomposition, nutrient cycling, and pest and weed seed control (Disque et al. 2018; Atwood et al. 2018).

In the case of birds, neonicotinoids are toxic even in small quantities; a single seed treated with neonics is enough to kill a songbird (Mineau & Kern 2023). Lesser amounts can emaciate birds, impair reproduction, and disrupt their migratory pathways. Moreover, current toxicity studies, and therefore EPA mitigations, are based on exposures to birds via direct ingestion of neonicotinoids as seed coatings or direct exposure during application. This creates an inherent bias towards "farmland" birds or granivores as the only bird species likely to be exposed. This belief was challenged in 2023 when imidacloprid was detected in over one third of birds sampled across a vast array of ecoregions in Texas. To quote the paper: "We found no relationships between exposure and foraging guild or avian family, suggesting birds with diverse life histories and taxonomies are at risk" (Anderson et al., 2023).

Neonicotinoids are not the only insecticides applied as seed treatments in row crops that raise concern. Commercial seed treatments containing diamide insecticides (e.g., chlorantraniliprole, cyantraniliprole, tetraniliprole) have been marketed as an alternative to neonicotinoids given their lower toxicity to adult honey bees. However, a recent laboratory study found that monarch butterflies - an imperiled species currently petitioned for listing under the Endangered Species Act - are highly susceptible to chlorantraniliprole (Krishnan et al. 2020). It is approximately 10 to 1000-fold more toxic to third-instar monarch larvae than tested organophosphate or neonicotinoid insecticides. Like neonicotinoids, anthranilic diamides tend to be persistent and mobile in the environment. Toxicity to Lepidopteran species is not typically assessed during pesticide registration and this raises concerns about the non-target impacts of diamides applied as seed treatments in the range of the monarch butterfly and other imperiled butterfly species.

Harms are well established, while benefits of prophylactic treatment are questionable.

In addition to concerns for wildlife, a little-recognized negative consequence of treated seeds are their contributions to microplastic pollution. The compounds used to attach pesticides to seeds are polymers which cause abrasion and give a surface for the pesticides to "stick" to. Treated seeds make up ~10% of agricultural microplastic pollution and as much as 1% of total microplastic pollution (Accinelli et al. 2019).[6] This strengthens the argument that treated seeds have serious environmental consequences and their use warrants reduction and mitigation. At the very least, we need information on usage.

Seed treatments in agricultural production are used primarily as an insurance measure for seedling plants and, despite their near-ubiquity, provide mixed results for users. A 2014 report from the Biological Economic and Analysis Division of EPA found that neonicotinoids as a treatment on soybeans seeds did not provide any economically significant benefit.[7] Multiple other studies have questioned the efficacy of insecticide seed treatments on other crops including corn and cereal crops (Milosavlijevic et al. 2019; Bekelja et al. 2023).

[6] Croda (2020). A microplastic-free future for seed treatments. Incotec. https://www.incotec.com/mediaassets/files/incotec/mpf-whitepaper-2.pdf?la=en-GB

[7] Environmental Protection Agency, Office of Chemical Safety and Pollution Prevention, Biological and Economic Analysis Division. 2014 October 3. Benefits of Neonicotinoid Seed Treatments to Soybean Production. https://www.epa.gov/sites/default/files/2014-10/documents/benefits_of_neonicotinoid_seed_treatments_to_soybean_production_2.pdf

Sweeping action to improve rules for pesticide-treated seed is needed.

We urge the EPA to take sweeping action to protect people, wildlife, and ecosystems from unintended consequences of treated seed use. **Ultimately, that would involve removing pesticide-coated seeds from inclusion under the treated article exemption of the Federal Insecticide, Fungicide, and Rodenticide Act (50 CFR §152.25(a)).** It is common sense for EPA to track and regulate pesticide-coated seeds the way it does for other pesticides. Treated seeds represent a major route of pesticide application in the U.S. and they are the primary delivery method for neonicotinoid pesticides, which put over two hundred threatened and endangered species at risk of extinction.[8]

Short of regulating pesticide-coated seeds under FIFRA, practical measures to mitigate the risk from seed treatments include:

- Improved instructions and warnings on treated seed bag tag labels
- Prohibiting harmful disposal practices, such as disposal via ethanol distillation
- Improved labeling to reduce dust-off
- Increasing planting distances from waterways and important conservation areas
- Collecting data on treated seed sales, use, and disposal
- Requirement of prescription by qualified agronomists before use

We elaborate on these recommendations below.

Recommendation 1: Label Improvements

A recent study indicates that many end users do not know what coats their seeds: 16% of the responding cotton growers, 35% of corn growers, 38% of the soybean growers, 43% of winter wheat growers and 57% of spring wheat growers were unable to provide the name of the seed treatment product used on their crops (Hitaj et al 2020). This was more often the case when the pesticide treatment was applied to the seed early in the supply chain. Pesticides are often bundled together when applied as a seed treatment. Transparency and clear labeling are needed to ensure that end users are fully informed about what pesticides they are purchasing and using on their property. This is imperative for ensuring farmworker safety and that best practices are followed to mitigate water contamination, dustoff, and wildlife exposure.

Per the ANPRM, we recommend the following instructions be included on treated seed bag tag labels and/or in the process of obtaining and using pesticide-coated seed:

1. Product names (e.g., Poncho), active ingredients of seed treatment products, and lot number. This information should appear on the tag that is directly affixed to the seed bag. This should be required prior to sale and distribution by manufacturers, distributors, seed dealers, etc.
2. Clearly stated agricultural use requirements and hazard statements in Spanish and English. These should appear on the tag directly affixed to the seed bag. End users should not be directed to a digital version of the label for information about appropriate worker protections and environmental hazards.

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[8] Environmental Protection Agency (2023, May 1). Imidacloprid, Thiamethoxam and Clothianidin: Draft Predictions of Likelihood of Jeopardy and Adverse Modification for Federally Listed Endangered and Threatened Species and Designated Critical Habitats. https://www.epa.gov/system/files/documents/2023-05/ESA-JAM-Analysis.pdf

3. Directions for recording information pertaining to the purchase of coated seed, including: quantity of purchased pesticide-coated seed; active ingredient(s) used in coating; product name(s) (e.g, Poncho); lot number.
4. Clear disposal guidelines including instructions that unused treated seeds cannot be used for ethanol, biodiesel, or other fermentation or oil processing. *See recommendation 2 below.* We also strongly suggest that a limit should be placed on the amount of excess seed that can be buried per acre to avoid unnecessary contamination.
5. Clear instructions on the burial depth of seed used in planting and any factors that might affect recommended depth.
6. Clear instructions for how to mitigate dust-off during planting for all products applied as coatings at any point in the planting process. *See recommendation 3 below.*
7. Clear guidelines for handling and cleaning equipment used in the course of planting treated seeds.
8. Clear instructions for preventing and mitigating water contamination, including specific guidance on planting distance from surface water and not planting in flood zones.
9. Clear instructions on recording use of seed and reporting requirements to State and Federal agencies such as the National Agricultural Statistics Survey. *See recommendation 4 below.*
10. Required buffer distance from adjacent properties growing organically.
11. Required buffer distance from adjacent properties which are conservation areas (Refuges, National Parks, National Forests, wildlife preserves, etc.)
12. Clear warnings to users when active ingredients are harmful to bees and other wildlife, made available in both English and Spanish
13. Guidelines for reducing human and wildlife exposure to pesticide-coated seeds, made available in English and Spanish.

Recommendation 2: Prohibit harmful disposal practices

Prohibit disposal via ethanol, biofuel, or oil production

In early 2021, severe pesticide contamination was uncovered at an ethanol plant outside of Mead, Nebraska. Nearby bee-kills led to the discovery that the plant was accepting the vast majority of excess treated corn seed in North America and processing it into ethanol – resulting in byproducts with astronomical levels of pesticide contamination. These byproducts were then spread on local fields as soil conditioners or via irrigation, and severely contaminated the surrounding area and its waterways. Cleaning up the contaminated plant is expensive and challenging, and it will continue to pose risks to the area for some time.

The situation in Mead raises critical questions about how treated seed should be handled in order to avoid contamination. There should be firm rules and label requirements prohibiting the use of waste treated seed for ethanol, biodiesel, or other fermentation or oil processing.

We also encourage EPA to work with industry on solutions for proper disposal of large quantities of pesticide-treated seed. We suggest exploring the possibility of creating programs or requirements whereby end-users may send their waste pesticide-treated seed back to the entity that treated the seed (e.g., manufacturer), who is then responsible for proper disposal.

Prohibit use of treated seed for wildlife plantings

Excess or waste treated seed is often used for wildlife habitat. We encourage EPA to create regulations that clearly prohibit the use of treated seed for this purpose, especially on refuge lands and managed wildlife lands (national and state parks, wildlife management areas, etc.).

Though habitat is being created with conservation in mind, sowing insecticide-treated seeds carries risks for wildlife. Excess treated seed is often sold at discounted rates for spring food lots - a form of wildlife habitat that is usually planted to support game species. Food lots with plants grown from insecticide-treated seeds are a risk to the very animals they are intended to sustain. The high water solubility of treatment active ingredients makes them liable to contaminate local waterways, leading to non-target invertebrate impacts and, ultimately, aquatic habitats and ecosystems with lower productivity (Hallmann 2014, Hladik et al. 2018b). Studies have found elevated neonicotinoid levels in deer and pheasants, presumably acquired from contaminated forage (Berheim et al. 2019; Sundall 2020).

We recommend that EPA develop new rules that specifically prohibit pesticide-treated seed for wildlife habitat. This would help avoid unnecessary environmental contamination and would provide clarity on this issue for end users.

Recommendation 3: Clearly instruct on dust-off mitigation measures

Dust off from the planting of insecticide treated seeds is an important exposure route for terrestrial insects in landscapes where these crops are sown. Bee poisoning incidents associated with insecticide-laden particulate matter from the abrasion of coated seeds during planting have been well documented (Pistorius et al. 2010; Sgolastra et al. 2012; Tapparo et al. 2012; Hopwood et al. 2016). Girolami et al. (2013) showed that a single pass of a pneumatic planter could kill 100% of the foraging bees exposed to exhaust air on the emission side under experimental conditions. Field data and modeling from Indiana suggest that over 94% of honey bee foragers across the state are at risk of exposure to neonicotinoid insecticides, including lethal levels, due to dust off during the period of maize sowing (Krupke et al. 2017). The same research estimated that a pulse of neonicotinoid residues would be deposited on nearly half of the state's land area during corn planting. These are conservative estimates of potential exposure via insecticidal seed treatments, given that many different crops are planted with treated seed across millions of acres in the US (Hladik et al. 2018a).

While improvements in the quality of seed coating material (i.e., polymers/binders) since 2008 have likely reduced the amount of active ingredient abraded and released in particulate matter generated at planting (Nuyttens et al. 2013), dust off of active ingredient at planting remains a concern for pollinator and aquatic health. Modifications to pneumatic planters, such as tubes that direct exhaust air to the ground or filtration and recirculation systems, can help to reduce dust off (Girolami et al. 2013; Biocca et al. 2017), but are not widely adopted. Exposure to seed-applied neonicotinoids during corn planting continues to be documented in honey bee colonies, resulting in elevated mortality and slower population growth (Samson-Robert et al. 2017; Lin et al. 2021).

In short: the dust created in the planting process poses a drift risk (Sgolastra et al. 2012; Schaafsma & Limay-Rios 2020) and labels need to clearly indicate how users can mitigate this risk. Examples of mitigation measures by end users include equipment modifications, improved fluency agents applied at recommended rates, and changing planting timing to avoid dry and windy weather conditions.

Recommendation 4: Collect and report data on treated seed sales and use patterns.

As the EPA engages in Endangered Species Act Section 7 consultations on a variety of chemicals, the lack of seed treatment usage data is becoming increasingly apparent, and increasingly needed. In the Agency's Jeopardy/Adverse Modification analysis performed on imidacloprid, clothianidin, and thiamethoxam, the Agency stated that:

> *A limited amount of general usage data was available for some uses (e.g., developed and open space developed uses, seed treatments)...*[9]

Better data on the sale and usage of pesticide-coated seeds will lead to more accurate and informed mitigations for Threatened and Endangered Species including those already determined to be jeopardized by neonicotinoids, such as the American Burying Beetle (*Nicrophorus americanus*), Fedner's Blue Butterfly (*Icaricia icarioides fenderi*), and Attwater's Prairie Chicken (*Tympanus cupido attwateri*).[10] Full knowledge of seed treatment use will also inform whether neonicotinoids and other seed treatment pesticides jeopardize Threatened and Endangered Species.

Exposure and poisoning incidents from pesticide-coated seeds are not well represented, or not at all represented, in currently available data from the EPA and other agencies. There is evidence of coated seed spills being an exposure route for wildlife (Roy et al. 2019, Roy and Coy 2020) and of wildlife succumbing to poisoning from pesticide-coated seeds.[11] Yet, these exposure routes are not adequately mitigated in any current labeling. Better data on seed spills, both real-world and experimental, would better inform mitigations the Agency could propose. Further, American Bird Conservancy recently analyzed the Pesticide Incident Data System (IDS). We found 371 unique incidents of pesticides harming wildlife, with *thousands* of additional incidents reported using industry-specific or company-specific code language. Because no key is provided, the exact nature of these incidents is unknown.[12] There is evidence of seed spills and wildlife exposure from neonicotinoid-coated seeds, but the reporting of these incidents is difficult or end users are unaware of a reporting framework, making mitigating these impacts impossible.

We urge the EPA to use its authority to collect high quality data on treated seed usage. We strongly recommend that EPA:

1. Require manufacturers, distributors, and seed sellers to collect and provide EPA with data on treated seed sales. This data collection should include treated seed vendors for ornamentals and non-agricultural use. The state of Vermont collects this information from seed dealers and makes this information available to the public via the Vermont Seed Report.[13]
2. Collect data and report annually on usage and use patterns of pesticide-coated seed. This data should be made available to the public, similar to the United States Geological Survey National Water Quality Assessment maps: https://water.usgs.gov/nawqa/pnsp/usage/maps/about.php.
3. Develop better and *more transparent* national incident reporting systems for spills, wildlife exposure, environmental impacts, and farmworker exposure to dust and other runoff generated during planting.

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[9] Environmental Protection Agency (2023, May 1). Imidacloprid, Thiamethoxam and Clothianidin: Draft Predictions of Likelihood of Jeopardy and Adverse Modification for Federally Listed Endangered and Threatened Species and Designated Critical Habitats. https://www.epa.gov/system/files/documents/2023-05/ESA-JAM-Analysis.pdf

[10] See "Neonicotinoid J/AM Supporting Excel Files" at https://www.epa.gov/endangered-species/final-national-level-listed-species-biological-evaluation-clothianidin

[11] NJ DEP: https://www.nj.gov/dep/fgw/news/2017/blackbirds.htm

[12] https://www.epa.gov/pesticides/epa-posts-pesticide-incident-data-publicly; Published analysis forthcoming.

[13] Vermont Seed Program: https://agriculture.vermont.gov/public-health-agricultural-resource-management-division/animal-feeds-seed-fertilizer-lime/seed

Recommendation 5: Require a prescription from an agronomist for treated seed.

The widespread, prophylactic use of neonicotinoid treated seeds on various crops, including corn, soy, wheat, and even alfalfa - a pollinator-attractive plant - is causing harm to pollinator populations (Hopwood et al. 2016), birds (Mineau & Kern 2023), and aquatic ecosystems (Sanchez-Bayo et al. 2016). Seed treatments can also disrupt soil communities (Parizadeh et al. 2021). Evidence is emerging that mammals are being affected by accumulated levels in the environment (Berheim et al. 2019). Large-scale, repeated use of pesticides is also a concern for pest species developing resistance.

We support requiring a prescription from an agronomist for pesticide-treated seed prior to deployment based on crop type, planting area, and projected pest abundance. In addition to addressing overuse of treated seed as a preventive measure, such a system would help to ensure that seed treated in one state meets the registration requirements of the state where the seed is being used. A successful program has been established in Quebec, Canada, providing a model for how this can be carried out. The State of New York recently passed the Birds and the Bees Act (SB1856a), which mandates creation of a similar program. Comparable programs are being considered in Vermont, Minnesota, and California through legislative measures, demonstrating a widespread desire for this type of support for growers.

Closing Remarks

We appreciate the opportunity to comment on this ANPRM and look forward to working with EPA and other stakeholders to develop clearer labels for pesticide-treated seed. We also sincerely encourage EPA to implement **protections that go beyond label changes.** A key element required to adequately mitigate pesticide impacts is real-world data, which is currently a massive knowledge gap for the Agency and for stakeholders. Baseline data on seed treatment use is needed to inform geographic planting restrictions and the development of preemptive mitigations and use reduction strategies. These data are also key to designing systems which allow for enforcement of label violations. Finally, we wish to emphasize the importance of the Agency using this opportunity to clearly establish its authority to exercise oversight and enforce label requirements for pesticide-treated seed.

This moment is a major opportunity for the EPA to institute change which will benefit wildlife, growers, and the public.

Sincerely,

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