



POLLINATOR FRIENDLY ALLIANCE

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[WWW.POLLINATORFRIENDLY.ORG](http://WWW.POLLINATORFRIENDLY.ORG)

## **Support for HF1317: Improved rulemaking and safer use, disposal and handling of pesticide-treated seed.**

Date: March 20, 2023

To: Minnesota House of Representatives, Chair Hansen and Environment and Natural Resources Finance and Policy Committee,

We strongly support HF1317 for improved rulemaking and safer handling of pesticide treated seed.

**Currently, there are not adequate federal or Minnesota state safeguards for the health of people and the environment from pesticide contamination from treated seed.** Additionally, treated seed currently is NOT regulated as a pesticide in Minnesota. The no-nonsense provisions in bill HF1317 are necessary to protect us, pollinators and the environment from contamination disasters and chronic pesticide contamination.

[Pollinator Friendly Alliance](#) is a Minnesota conservation organization with a membership of urban and rural residents, scientists, businesses, farmers and ecologists from around Minnesota and beyond. We urge state legislators to step up in the absence of a fail-safe system to protect our waters, land and people from pesticide seed contamination. This is not a big ask - to simply strengthen the existing system for better stewardship. The rewards for health are great.

Some countries have banned neonicotinoid pesticides and treated seed entirely. Some communities around the U.S. are further restricting use. Almost fifty Minnesota communities have adopted resolutions to cease neonicotinoid pesticide use.

The wealthy pesticide industry can sell more treated seed using a loophole in federal pesticide law - **“treated article exemption” which permits seeds to be coated with toxic insecticides without assessment by the EPA for health or environmental effects.** This allows treated seed to be used without proper oversight.

The result of this negligence is evidenced by water contamination in Minnesota and an entire community in [Nebraska taking ill from pesticide coated seed contamination](#). Labels do not always protect us from improper handling, storage or mis-use either. Labels are very difficult to enforce because they are often impossible to interpret, the meaning is unclear and often not defined – for example what is a “measurable residue”? The label does not explain if the seed can be burned or re-used such was the case in the Nebraska catastrophe.

I come from a farm family and live in a rural area, so I know first-hand corn and soybean farmers often drill 1,000’s of acres of pesticide coated seed at a time. The pesticide dust floats and moves through the air, and afterward piles of seed are leftover laying in fields where birds and wildlife eat them, and ground water becomes contaminated. The current voluntary best practices are not

going to protect us or wildlife and the environment. A law is needed to require proper stewarding of treated seed.

**Neonicotinoid contamination has been studied repeatedly and reported on for years – it is no secret that neonicotinoid insecticides on coated seeds are toxic. Recent science shows** neonics have [human health effects](#), pesticides kill pollinators outright and sicken them at sublethal doses, neonics contaminate water ([Five surface water pesticides of concern, Minnesota MDA 2020](#)), birds are effected ([Neonic reduces migration in songbirds, Eng 2019](#)) and most recently large mammals such as deer ([Effects of neonics on physiology and reproduction of white-tailed deer, Berheim 2019](#)). Two flagship species- monarch butterfly and rusty patched bumble bee (Minnesota state bee) are under the watchful eyes of pollinator researchers and declining numbers of monarchs tell us that pollinators are at a critical point for extinction requiring immediate action.

**These small steps to steward treated seed will help keep Minnesota communities safe.**

Thank you,  
POLLINATOR FRIENDLY ALLIANCE  
[www.pollinatorfriendly.org](http://www.pollinatorfriendly.org)

Selected support references:

**HUMAN HEALTH EFFECTS OF NEONICS** National toxicology report from US Dept. of Health and Human Services ISSN: 2473-4756 [https://ntp.niehs.nih.gov/ntp/results/pubs/rr/reports/rr15\\_508.pdf](https://ntp.niehs.nih.gov/ntp/results/pubs/rr/reports/rr15_508.pdf)

**NRDC BRIEFING TO CONGRESS** on Neonic Pesticide Human Health Harms, October 2019.  
<https://www.nrdc.org/experts/jennifer-sass/nrdc-briefs-congress-neonic-pesticide-human-health-harms>

**PESTICIDES IN MINNESOTA WATERS:** Minnesota Department of Agriculture, *surface water pesticides of concern* (2020)  
<https://www.mda.state.mn.us/surface-water-pesticides-concern>

**INSECTICIDE COATED SEED CONTAMINATES NEBRASKA COMMUNITY AT ETHANOL PLANT**  
January 2021: <https://www.theguardian.com/us-news/2021/jan/10/mead-nebraska-ethanol-plant-pollution-danger>

**POLLINATOR DECLINE:** Xerces Society: *The science behind the role neonics play in harming bees*. Jennifer Hopwood, Aimee Code, Mace Vaughan et al. (2016)  
[https://xerces.org/sites/default/files/2018-05/16-023\\_01\\_XercesSoc\\_ExecSummary\\_How-Neonicotinoids-Can-Kill-Bees\\_web.pdf](https://xerces.org/sites/default/files/2018-05/16-023_01_XercesSoc_ExecSummary_How-Neonicotinoids-Can-Kill-Bees_web.pdf)

**NEONIC EFFECTS ON LARGE MAMMALS:** Scientific Reports: *Effects of Neonicotinoid Insecticides on Physiology and Reproductive Characteristics of Captive Female and Fawn White-tailed Deer*. Elise Hughes Berheim, Jonathan A. Jenks, Jonathan G. Lundgren, et al. volume 9, Article number: 4534 (2019)  
<https://www.nature.com/articles/s41598-019-40994-9>

**RESULTS OF PESTICIDE STUDY OF NEONIC EXPOSURE TO WHITE-TAILED DEER IN MINNESOTA**  
March 1, 201, Minnesota Department of Natural Resources

<https://www.dnr.state.mn.us/news/2021/03/01/preliminary-results-pesticide-study-show-widespread-neonicotinoid-exposure-minnesota-white-tailed-deer>

**NEONIC EFFECTS ON SONGBIRDS:** Science: *A neonicotinoid insecticide reduces fueling and delays migration in songbirds.* Margaret L. Eng, LeBridget, J. M. Stutchbury, Christy A. Morrissey. Issue 13 Sep 2019: Vol. 365, Issue 6458, pp. 1177-1180.

<https://science.sciencemag.org/content/365/6458/1177>

**POLLINATOR PROTECTION RESOLUTION:** *Model resolution for cities, counties, state agencies, school districts.* Pollinator Friendly Alliance, Humming for Bees, Pesticide Action Network, Pollinator Minnesota 2020.

<https://static1.squarespace.com/static/59fcf40ab1ffb6ee9911ad2a/t/5f8fb7dcac3e6348089291a2/1603254237712/MODEL+resolution+2020.pdf>

**NEONIC CAUSES AUTISM-LIKE SYMPTOMS:** November, 2022. Neurosciencenews.com

<https://neurosciencenews.com/neonicotinoid-asd-21898/>

**AN UPDATE OF THE WORLDWIDE INTEGRATED ASSESMENT ON SYSTEMIC INSECTICIDES: PART 2: IMPACTS ON ORGANISMS AND ECOSYSTEMS:** 2021 Pisa, Goulson, Yang, Gibbons, Sanchez-Bayo

<https://link.springer.com/article/10.1007/s11356-017-0341-3>

**RULEMAKING TO REGULATE TREATED SEED**, California 2020 NRDC



March 7, 2023

To: Members of the Minnesota House Environment and Natural Resources Finance and Policy  
Regarding: *HF 1317 - Terms defined; Use, storage, disposal, and sale of pesticide-treated seed regulated; label statements for pesticide-treated seed required; consumer guidance required; rulemaking required; and money appropriated.*

The American Seed Trade Association (ASTA) is writing this letter to comment on HF 1317, which is currently pending before the Minnesota legislature, and set for hearing by the House Environment and Natural Resources Finance and Policy Committee on March 22, 2023. This bill proposes to regulate the use, storage, disposal, and sale of pesticide-treated seed; would require label statements for certain pesticide-treated seed; and would require rulemaking by the Minnesota Pollution Control Agency.. Most of those initiatives are already in place on a voluntary basis by the seed industry and promoted with growers using “bag tags” affixed to all bags of treated seed.

Founded in 1883, ASTA is one of the oldest trade organizations in the United States. Its membership consists of over 700 companies involved in seed production and distribution, plant breeding, and related industries. ASTA is a diverse organization. It represents all types of seed companies and technologies – seed from alfalfa to zucchini, technologies from organic to biotechnology, and companies from “mom and pop” to multinationals. It works on behalf of its members at the state, national, and international levels. In other words, ASTA represents every seed company that would be affected by the proposed legislation, and it works in cooperation with the rest of agribusiness and consumers, whom the proposed legislation would also impact.

In general, seed treatments enable earlier and faster planting; stronger, more uniform stands; optimal plant populations; and healthier plants that help increase productivity. Because some pests can damage the seed or seedling to the extent that there are no rescue treatment options available and the plants may either die or not produce a harvestable yield, seed treatments give farmers confidence that they are proactively managing early-season risk and minimizing the expense and environmental impact of replanting.

Handling, disposal and general user guidance has been addressed by the seed industry through training for farmers about proper use of seed treatments and publishes user labels on every bag of seed. To learn more about the industry’s efforts, go to [seed-treatment-guide.com](http://seed-treatment-guide.com). That document, currently being updated (due April 1, 2023) is referenced and acknowledged in multiple places within US EPA rules. More information and resources about treated seed are available at [betterseed.org/treated-seeds](http://betterseed.org/treated-seeds). Both documents address pollinator protection, which is extremely important for agriculture production.

In summary, the use of seeds improved through modern technologies, such as seed treatments, continues to grow around the world as a result of their economic, environmental, and human health benefits. Farmers’ use of these seeds in Minnesota is no exception to this pattern of growth. In our view, HF 1317 as it is now drafted raises several serious practical concerns, including requiring disruptions of the supply chain and labeling of treated seed destined for Minnesota. In addition, it would add unnecessarily to the cost of doing business in Minnesota and penalize Minnesota farmers and ultimately, consumers.

Please do not hesitate to contact us if you have any questions. Thank you for your consideration.

Sincerely,

Pat T. Miller  
Director, State Affairs  
American Seed Trade Association  
[pmiller@betterseed.org](mailto:pmiller@betterseed.org)

**first-the seed®**

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**From:** Alan Smith <[ASmith@mrgkc.com](mailto:ASmith@mrgkc.com)>

**Sent:** Monday, August 3, 2020 12:02 PM

**To:** Alan Smith <[ASmith@mrgkc.com](mailto:ASmith@mrgkc.com)>

**Subject:** AltEn Treated Seed Green Recycling at \$0.00 cost for Processing Corn-  
Wheat- Sorghum - Starches

## 2020 AltEn Green Recycling Program for Corn – Wheat and Sorghum Seed

**Greetings from AltEn of Mead, NE. the Seeds industry's #1 choice for recycling treated and regulated seeds in North America.**

**AltEn uses the discard to produce Ethanol and all by products are put thru an anaerobic digester and the by products are all land applied under State of Nebraska EPA permit and allowance by the USDA.**

The 2020 AltEn Corn- Wheat and Sorghum Seed Recycling Program is as follows:

1. AltEn can use palletized unit bags seeds - palletized super sacked seeds and true bulk treated seeds - 44,000 lbs net required for all Van deliveries and 50,000 lbs net for all hopper deliveries. You can deliver as little as 1 pallet yourself to our plant in Mead, NE. for \$0.00 cost for process- you will need an AltEn BOL and delivery date and time scheduled with our plant site.
2. AltEn requires the grain to arrive in USDA #2 grader or better to ensure the starches in full strength in each seed recycled. Basically, the seed has to have stayed completely dry during its entire storage period. Any seeds delivered to AltEn, Mead, NE. that the starch is damaged will be dispose of the full expense of the seed producer that shipped the non-usable product to AltEn. AltEn will bill the producer for all labor – disposal freight and disposal fees payment due in 30 days from ship date.
3. AltEn is charging \$00 for all seed processing delivered to Mead, NE. Contact Craig Gubbels to get started. email - [CGubbels@mrgkc.com](mailto:CGubbels@mrgkc.com) or **402- 658- 9997** AltEn will do all the arranging and get shipping pricing to make the entire process of green recycling treated discard seed as easy as one phone call or email. AltEn furnishes all BOLs need. If you want to deliver you discard yourself you will still need an AltEn BOL – and delivery date for our Mead, NE. plant site.
4. AltEn is currently receiving nearly 98% of all the discard created by the seed industry in North America. We are under long term contract by all the Major producers as: Monsanto– Bayer- Syngenta- Dow AgReliant and Land O Lakes. We receive discard from at least another 100 producers across North America annually. AltEn is now offering this very same program to every seed producer in North America - \$00 for seed processing deliver to Mead, NE.

**2020 AltEn- with Integrated Recycling offers Fee Based Disposal Programs for all other Treated, non-treated or**

regulated non-Ethanol producing seed; as Soybeans-  
Rye- barley, popcorn and all other.

If you have treated seed discard of any type Integrated Recycling Inc. can get the discard out of your facility and disposed of properly, timely, affordable, safely, and legally. IR can get you pricing on freight and fees prior to ship for your approval and [ASmith@mrgkc.com](mailto:ASmith@mrgkc.com)

Any questions please call Alan Smith Project Coordinator: 735-735-6802 Thankyou for reading this email.

**Thank you for Your Business.**

**Respectfully,**

**Alan J. Smith**  
**AltEn LLC**  
**North American Feed Stock Coordinator**  
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**[alanjsmith196](mailto:alanjsmith196)**

March 21, 2023

Chair Hansen, Committee Members:  
HF 1317

The news of the disaster in Mead NB in 2021 is still vivid because of disturbing photos of the scope and environmental destruction that took place near the AltEn Ethanol Plant. In fact there had been many environmental violations since it opened in 2015, but the plant continued operate as a free drop off for leftover treated seeds, saving disposal costs for farmers.

As early as 2018, residents collected fermented corn seeds from fields in Mead that had been applied to the soil as “amendments to boost fertility”- In actuality they were waste from the AltEn Plant that contained high levels of neonicotinoids. These were leftover seeds from all around the US and stored outdoors in green piles covering 30 acres. Residents had to keep windows closed due to the stench, animals that were outdoors began showing neurological problems.

In 2019 state regulators found liquid waste was also stored in lagoons on site and tests revealed the neonics were over 5000 times the level considered safe.

Regulators closed the plant in Feb 2021, and within a week a pipe ruptured sending 4 million gals of wastewater into Mead’s rivers and streams. Fungicides and neonics have been detected 40 feet below ground in drinking water wells and as much as 6 miles downstream from the AltEn Plant; Wu-Prof Smart who works at the UNL reported that entire honey bee hives within 3 miles of Mead died.

As of today, March, 2023, the seed waste remains at the site covered in a mixture of clay, cement and polyester, and Prof Smart reports *it is still leaching neonics into the aquatic systems*. Fish and beaver kills have also been reported.

MN has 19 ethanol plants , making it the 5<sup>th</sup> largest ethanol producer in the US producing over 1.4 billion gals annually. Since the plant in Mead was receiving seeds from around the US, it makes me wonder if some seeds were from MN.

The kind of environmental destruction that happened at Mead must not ever happen again and surely not in MN.

Please support HF 1317 to govern the use, storage, disposal , labeling and sale of pesticide-treated seeds.

Thank you for your consideration.

Margot Monson, entomologist, beekeeper  
22 Ludlow Ave  
St Paul, MN 55108





March 21, 2023

To: Members of Minnesota House of Representatives Environment and Natural Resources Finance and Policy Committee  
Chair Rick Hansen

Re: Please Support [HF 1317](#) to provide better stewardship of pesticide-treated seed

Dear Chair Hansen and Committee members,

On behalf of the member organizations of the Minnesota Environmental Partnership, I urge the Committee to support H.F. 1317, a bill to require better stewardship of pesticide coated corn and soybean seed. This legislation would protect Minnesotans and our natural environment from contamination that is becoming more apparent in our water and ecosystems.

The buildup of neonicotinoids in Minnesota wildlife, such as the state's deer herd, is a visible sign of the impacts already taking place in our environment. Many of our pollinators, on which our broader ecosystem and public health depend, are increasingly endangered by the use of neonicotinoids. Despite the harmful effects of neonicotinoid pesticides on pollinators, wildlife, and people, protections against contamination from these pesticides are limited.

Currently, there are not adequate federal or Minnesota state safeguards for the health of people and the environment from contamination due to coated seed. Furthermore, pesticide coated seed is currently not regulated as a pesticide in Minnesota. This loophole allows for casual use and mishandling of these pesticides that can be devastating to ecosystems and human health.

Proper disposal, storage, and re-use of these seeds can help limit pesticide drift and exposure to non-target species. Currently, there is not a comprehensive law with formal rules to provide real protections from the risks presented by coated seed. [MPCA has a single fact sheet](#) that provides guidance for coated seed use, but it is not sufficient in addressing the magnitude of the problem.

Some states and countries are taking more far-reaching steps, banning neonicotinoids outright or restricting their use. This comparatively modest step will give our state a tool to put safe practices into law, so that disasters don't occur and pesticide drift is reduced. It will create reasonable, actionable protections for our people and our pollinators. Please support H.F. 1317.

Thank you for your attention to these underlying concerns. We look forward to working with you to implement these protections.

Sincerely,

Steve Morse  
Executive Director

*Submitted on behalf of the following organizations:*

Clean River Partners

Climate Land Leaders

Institute for Agriculture and Trade Policy

Lakeville Friends of the Environment\*

League of Women Voters Minnesota

Minnesota Center for Environmental Advocacy

Minnesota Ornithologists Union

Minnesota River Valley Audubon Chapter

Pollinate Minnesota\*

Pollinator Friendly Alliance

Renewing the Countryside

Roots Return Heritage Farm\*

Saint Paul Audubon Society

Xerces Society\*

*\*denotes non-MEP member organization*

Testimony statement provided March 21, 2023 to the  
Environment and Natural Resources Finance and Policy Committee  
MINNESOTA HOUSE OF REPRESENTATIVES regarding 93<sup>rd</sup> LEGISLATIVE BILL HF1317

**Introduction:** My name is Dr. Judy Wu-Smart and I'm an associate professor and bee specialist at the University of Nebraska-Lincoln, however, I'm acting in my own personal capacity and not as a representative of the university. I have provided testimonies over the past two years regarding the persistent widespread bee losses we have experienced due to systemic pesticide pollution caused by a facility improperly disposing pesticide treated seeds through ethanol production. This practice resulted in the release of mass quantities of solid and liquid byproduct waste highly contaminated with pesticide residues. These byproducts and unprocessed seed piles remain on property, as the images below show, and the clean-up process continues to challenge both state and federal agencies.

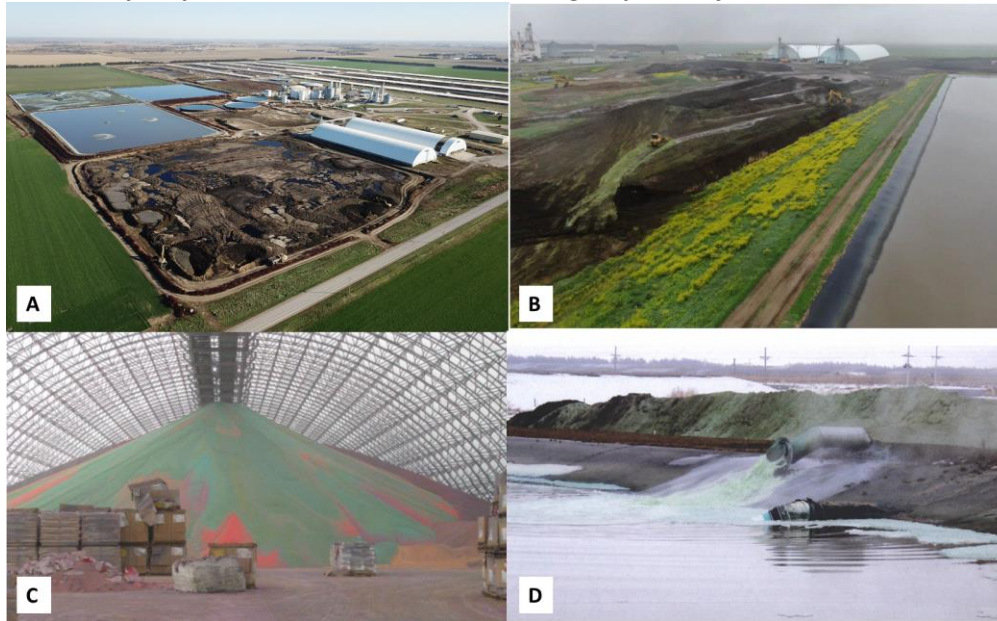
**Main areas of concern:** Systemic pesticides, including neonicotinoid insecticides and many fungicide products, are widely available for agricultural and urban uses and while they have been shown to be less toxic to mammals, they are also known to cause a suite of ecological harm. My colleagues on the AltEn Health Study Team (<https://www.unmc.edu/publichealth/research/alten/index.html>) and I have since found detectable levels of neonicotinoids and fungicides in surface and ground water samples, in tadpoles, and in the eggs of black birds that live near the facility or near farms where the contaminated byproducts were land-applied as soil conditioners, impacting private farms at least 6 miles downstream. Even worse is the detection of elevated pesticide levels in the air outside and inside of the homes near the ethanol plant even though the facility has been closed for 2 years (since Feb 2021). We are now at a point where we are trying to determine what all this data means.

There are no safe benchmarks established for exposure to multiple compounds in the air, water, and food. These types of pesticides move readily through water systems, and into soil and plants where wildlife become exposed, but residue levels are not monitored. They are not considered to cause cancer and not known to bioaccumulate in tissue like other hazardous substances, therefore there are no clear endpoints to delineate what are "safe" levels of exposure. The levels of neonicotinoids found in residential homes (clothianidin detected in air as high as 59 mg/m<sup>3</sup> and imidacloprid detected in dust swipes at 407 ng/g) are unfortunately within levels that laboratory studies on rabbits and rats show symptoms and physiological changes (above LOAEL levels). Some symptoms listed are minor (i.e. weight changes) and would not constitute immediate concern, however, other studies indicate potential impacts on reproductive functions (during pregnancy and on fertility of sperm) and on the health of developing children (autism and neurological impairments). Given the range in severity and types of symptoms associated with neonicotinoid/fungicide exposure, knowing what levels are considered harmful would be very helpful for communicating results and providing the public with the appropriate context.

Nebraska state officials and EPA have *NOT* been able to bring us clarity on this even after 3 years. Think about that for a moment. Imagine what you would do if you were told the air you breathe inside your home has detectable levels of pesticides, but you were not provided any information on what that may mean to your family's health nor what to do about it. I'm submitting this testimony because while what is happening in Nebraska is certainly an extreme example with unprecedented contamination loads, it echoes real concerns people have about the many unknowns surrounding these compounds.

**Pesticide overloading** from multiple sources and chemical types, as it is in the case in NE, has created "too much complexity and uncertainty to rule out potential adverse harm to the environmental and humans" which is how EPA responded to our situation through email exchanges with our state agency officials (Sept & Jan 2021). Unfortunately, this is not strictly a Nebraska problem. Recent studies show neonicotinoids are commonly detected in humans (urine samples), wildlife, and in many of the foods we consume which are also the same plants most in need of pollinator services by bees.

The lack of regulatory oversight and federal exemption on “treated articles” has caused confusion and concerns for state officials and local communities. It also highlights the many challenges to widespread systemic pesticide pollution (from a research and regulatory perspective) especially after a disaster has occurred and with little data help us understand what went into the plant nor the long-term impacts of their improper treated seed disposal practices. This is an ongoing issue that EPA suggests will take many years to clean up. **More disturbing is the fact that since AltEn’s closing no one seems to know where surplus pesticide treated seeds are being disposed of now.**



**Photo A:** Drone image (taken by Dr. J. Schalles, Creighton University) in Nov 2021 shows pesticide-laden wetcake piles located near several waste lagoons with visible pieces of the damaged protective liners floating up indicating leaching of pesticides into the ground below. **Photo B:** Drone image (from NDEE May 2021 report) shows large areas of blooming flowers that have likely taken up harmful levels of systemic pesticides and may be lethal to visiting pollinators. **Photo C:** Image inside white hoop structures (taken from NDA 2019 report) storing a large pile of discarded surplus and pesticide treated crop seeds which was received from seed companies. The colorant added to seeds indicates the presence of pesticides on seed coats. **Photo D:** Image of lagoon from NDEE Feb 2021 report which estimated 100,000 gallons of pesticide-laden effluent was produced per day. This pesticide-laden effluent along with wetcake waste was applied to farms as soil conditioners from 2018-2019 without farmer’s knowledge of pesticides because of the unclear language and classification surrounding treated articles.

HF1317 seeks to provide more clarity and resolve some of the uncertainties that continue to challenge our efforts. Bees are bioindicators of our environment and can help guide us to become better stewards of our land. Many may not care about losing a few bugs, but widespread loss of insects hinders ecological services (including pollination, pest control, and nutrient cycling) critical for sustaining natural resources. It also reduces vital food web support for other wildlife and critters. Pesticide overloading and the lack of knowledge regarding the use, movement, spread, persistence, and toxicity of systemic pesticides are real concerns with One Health consequences and HF1317 helps to address these knowledge gaps and concerns. I thank the committee for the opportunity to testify and I welcome any questions.

Judy Wu-Smart  
 Associate Professor & Extension Specialist  
 Director of University of Nebraska-Lincoln Bee Lab  
 Email: [jwu-smart@unl.edu](mailto:jwu-smart@unl.edu)  
 Website: <https://entomology.unl.edu/unl-bee-lab>

**References:**

AltEn Health Study Team website (hosted by the University of Nebraska-Medical Center) (<https://www.unmc.edu/publichealth/research/alten/index.html>) for details of research updates, townhall presentations, and other articles on AltEn.

Ospina M, Wong LY, Baker SE, Serafim AB, Morales-Agudelo P, Calafat AM. Exposure to neonicotinoid insecticides in the U.S. general population: Data from the 2015-2016 national health and nutrition examination survey. *Environ Res.* 2019 Sep;176:108555. doi: 10.1016/j.envres.2019.108555. Epub 2019 Jun 24. PMID: 31288196; PMCID: PMC6710140.

Thompson et al. 2020. A critical review on the potential impacts of neonicotinoid insecticide use: current knowledge of environmental fate, toxicity, and implications for human health *Environ. Sci.: Processes Impacts*, 2020, 22, 1315–1346

An update of the worldwide integrated assessment on systemic insecticides: Part 2: Impacts of organisms and ecosystems 2021. Pisa et al. *Environ Sci Pollut Res* **28**, 11749–11797  
<https://link.springer.com/article/10.1007/s11356-017-0341-3>

M. Chen, L. Tao, J. McLean and C. Lu, Quantitative analysis of neonicotinoid insecticide residues in foods: implication for dietary exposures, *J. Agric. Food Chem.*, 2014, 62, 6082–6090

US EPA 2017. Clothianidin. Draft Human Health Risk Assessment in Support of Registration Review: EPA-HQ-OPP-2011-0865-0243. <https://www.regulations.gov/document/EPA-HQ-OPP-2011-0865-0243>