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April 13, 2020

OPP Docket
Environmental Protection Agency Docket Center (EPA/DC)
(28221T)
1200 Pennsylvania Ave. NW
Washington, DC 20460-0001

Re: Acetamiprid EPA-HQ-OPP-2012-0329
Clothianidin EPA-HQ-OPP-2011-0865
Dinotefuran EPA-HQ-OPP-2011-0920
Imidacloprid EPA-HQ-OPP-2008-0844
Thiamethoxam EPA-HQ-OPP-2011-0581

Dear Chemical Review Managers:

LEAD for Pollinators, Inc. welcomes the opportunity to comment upon the **Proposed Interim Decision on Neonicotinoids.**

Environmental effects of neonicotinoid pesticides have been studied more than any other insecticide, with the possible exception of DDT. The preponderance of literature confirms the harmful effects of these pesticides to managed honey bees, native pollinators, and other organisms. EPA has this science-based literature available to them, conducted by independent researchers at land-grant universities across the U.S., as well as USDA researchers, USGS researchers, and international researchers. EPA is fully aware of the damage being caused to honey bees, native pollinators, soil sustainability, water quality, and beekeeping by neonicotinoids.

The impact upon honey bees by this class of pesticide results in:

- A 24% decline in overwintering success of honey bee colonies
- Natural forage areas contaminated with bee toxic pesticides
- Reduced flight capacity in honey bees, decreasing food-collecting ability
- Impaired basic motor coordination of honey bees

- Invertebrate toxic levels found in surface water after rain events, in wetlands, and in snowmelt (A bee colony can use up to three gallons of water daily.)
- Contaminated pollen and nectar being returned to the hive leading to sub-lethal levels of toxins fed to honey bee larvae
- Reduced reproductive capability in queens and drones
- Contaminated soil, water, and plant products which translocate into the pollen and nectar
- Synergism with other pesticides increasing the toxicity levels of herbicides, fertilizers, fungicides, adjuvants, and surfactants in the pesticide tank mix
- Wildflower contamination. 97% of neonicotinoids brought to the hive were collected from wildflowers, not crops, showing the drift through the soil, water, and air of these pesticides into natural forage areas
- Decreased immunocompetence of honey bees leading to impaired disease resistance
- The spread and abundance of pathogens and parasites among honey bees

State and Local Actions

During 2015 ten states introduced legislation to ban the use of neonicotinoids. Eugene, Oregon, and Portland, Oregon have banned neonics. In 2016, Connecticut and Maryland restricted the use of neonics to protect bees and the fishing grounds of the Chesapeake Bay. (http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2015/07/29/to-save-bees-some-states-take-aim-at-pesticides, http://kneb.com/agricultural/maryland-becomes-first-state-to-restrict-neonics/ and https://www.clf.org/blog/beelieve-maryland-connecticut-pass-landmark-legislation-protect-pollinators/ . The State of Minnesota is also reviewing how neonics are used. http://www.vmdtoday.com/news/state-news-minnesota-law-strives-to-save-bees-support-farmers

A variety of states have revoked the use of neonics –see labels for
http://www.domyownpestcontrol.com/safari-20sg-systemic-insecticide-with-dinotefuran-p-2512.html
http://www.domyownpestcontrol.com/temprid-sc-insecticide-p-1175.html

The state of Vermont has placed a moratorium on soil drenches with imidacloprid.
http://agriculture.vermont.gov/sites/ag/files/pdf/apiary/PesticideRecommendations_DRAFT.pdf

New York state has restricted uses of dinotefuran , Imidacloprid, clothianidin, thiamethoxam.
http://www.dec.ny.gov/docs/materials_minerals_pdf/nysactiveingredrev.pdf

BJ’s Wholesale Club, Lowes, and Home Depot are now requiring their vendors to stop using neonics or to clearly label products containing or treated with neonics. In 2016 Scotts Miracle-Gro, announced its decision to cease including neonics completely in its home garden products. These entities are responding to the scientific research concerning neonics and to the public outcry to protect pollinators vital to an affordable and sustainable food supply from the adverse impact of this class of pesticide.

A 2016 report, "*Heavy costs weighing the value of neonicotinoid insecticides in agriculture"* compiled by the Center for Food Safety expressed the concern the Environmental Protection Agency (EPA) had "overvalued the "insurance" neonicotinoids offer against the mere risk of pest pressures, which are often not realized. This has led to heavy costs to the agricultural community and the nation as a whole. "Pre-sterilizing" fields has, in effect, rendered integrated pest management (IPM), in which pesticides are only used if economic pest damage thresholds are exceeded, obsolete for many major field crops."

The economic costs of the diversity of adverse effects are vitally important to beekeepers working to maintain crop pollination livestock integral to increasing crop yields. The financial losses of honey bee livestock to service crop pollination contracts will adversely affect a variety of crops across the growing season. Damage to honey bee livestock in one crop affects the pollination service of the next crop as there are less bees to service the crop. As end of summer losses continue to increase too many commercial beekeeping operations face a complete loss of livestock inventory. Honey bees are not feed lot livestock, nor are they raised to be slaughtered at the end of a season. Beekeepers are annually experiencing unreasonable adverse effects not realized by any other agricultural stakeholder.

Neonics Reduce Biodiversity

It is imperative we work to save the biodiversity not only of aquatic ecosystems, but all other ecosystems linked to our vital food web. Since the prophylactic use of seeds treated with neonicotinoids is responsible for most of the soil and aquatic contamination, while many studies point to little productivity gain, one obvious solution is to stop the marketing of seeds coated with these insecticides (van der Sluijs et al., 2015) and use alternative and carefully targeted methods for pest control in agriculture (Douglas and Tooker, 2015; Furlan and Kreutzweiser, 2015), such as integrated pest management (IPM). At the same time, remediation systems based on photolytic processes (Malato et al., 2001) and wetlands phyto-remediation (Beketov and Liess, 2008c) should be implemented to reduce as much as possible the current and legacy contamination by these and other pollutants.

Penn State University research found neonic coated seeds "reduce populations of insect predators as much as broadcast applications of commonly used pyrethroid insecticides." (Douglas, Tooker, et al., 2016) "This result suggests that neonicotinoids are reducing populations of natural enemies at least partly through their toxic effects rather than simply by reducing the availability of their crop pest foods," said Douglas.

The National Wildlife Federation featured research by Nadia Tsvetkov of Ontario's York University and colleagues found that bees do not even need to forage on agricultural plants to get harmful neonic doses. In 2017, they reported in *Science* that the insecticides can move from farm fields to nearby meadows and woods, where they are taken up by the willows and wild clovers bees feed on. "We found neonicotinoids in plants far from agricultural areas," Tsvetkov says."

A Corn Dust Consortium Report found "Although neonicotinoid seed treatments are used on a wide range of crop plants, including soybean, cotton, canola, wheat, sunflower, potato, and many vegetables

(7USC 136a(c)(5); Wachendoorff, 2012), reported honey bee kills from neonicotinoids have most often been associated with dust from corn seed released by vacuum planters at planting time (Andersch, 2010;Johnson, 2013; Blanken, 2016, Zhu, 2015) ·In addition to affecting honey bees and native bees, neonicotinoids applied as seed treatments may also affect other beneficial insects (Koh, 2015; Park, Mia, 2015) and contaminate groundwater, streams and wetlands (Rundolf, 2015; Vaughan, 2015).Treated seeds are also attractive to birds, and the amount of neonicotinoid on one treated corn kernel is enough to kill a songbird"(Vaughan, 2015). *These research findings make it clear pesticide coated seeds are a pesticide application.* Therefore, pesticides coated onto seeds should not be exempt from FIFRA pesticide regulations 40 CFR 152.25(a). (https://www.govinfo.gov/content/pkg/CFR-2018-title40-vol26/xml/CFR-2018-title40-vol26-sec152-25.xml)

Labels and MP3s

Federal action for protecting pollinators has included amending labels and requiring each state to develop Managed Pollinator Protection Plans (MP3). These amended labels have advisory language which "facilitates" MP3s advising beekeepers to either cover or move managed bees. (https://www.regulations.gov/docket?D=EPA-HQ-OPP-2014-0818) This "amended" Advisory Language directly conflicts with the label's Mandatory statement; "Do not apply or allow residues on blooming crops or weeds if bees *and other pollinating insects* are visiting the treatment area." EPA PR Notice 2000-5 is quite specific: Advisory Language on a label is only appropriate if it does not conflict with Mandatory Language. Even the Mandatory Hazard Statements are inadequate; they only consider acute impacts, and not the long term exposures or the ecological risks which are inherent with the use of systemic pesticides. It is critical that pesticide product labels be clear and consistent across pesticide classes and ingredients. Any risk assessment that determines the mitigation strategies listed on labels should be based on the scale of use, and not through isolated assessments by crop or use. Label statements must be enforceable and relevant to on-the-ground conditions.

> *"Innovative policy changes are needed in four problem areas: excessive faith in the accuracy of pre-market risk assessments and regulatory thresholds; post-approval monitoring of actual impacts; risk arising from formulated pesticides, rather than just pure active ingredient; challenges inherent in assessing and mitigating the combined impacts of all GE traits and associated pesticides on agroecosystems, as opposed to each trait or pesticide alone; and, tools to deal with failing pest management systems." (Benbrook, Charles M., Why Regulators Lost Track and Control of Pesticide Risks: Lessons From the Case of Glyphosate-Based Herbicides and Genetically Engineered-Crop Technology)*

The examination of the lone active ingredient of a pesticide in the pesticide registration process and its impact upon adult honey bees does not reflect the real-world pesticide exposure of our bees. The adjuvants, surfactants, "other ingredient," synergisms within tank mixes of multiple pesticides are not part of the risk assessment when registering the pesticide. The recently published research, "In-hive pesticide exposome: *Assessing risks to migratory honey bees from in-hive pesticide contamination in the*

Eastern United States," highlights the fact our "terrestrial biomonitors" called our honey bees, "return with accumulated contaminants to the hive."

The current EPA guidelines place a greater emphasis on chemical residues over observed biological data. Due to environmental constraints, replication of residue studies has proven to be difficult. In addition to this, the current EPA guideline often finds studies unacceptable or only supplemental if there is no residue data to supplement the biological data. When any chemical residues or metabolites are found in bloom, dead bees, bee bread, or wax, it can be ascertained that active ingredient caused the resulting damage. With a No Observed Effect Concentration (NOEC) of 1-3 ppb, even the remotest of exposures will at minimum, have sub-lethal effects upon a singular honey bee, which will in turn affect a hive.

Pesticide manufacturer research submitted to EPA for registration is based on analysis of solely the active ingredient. However, the "other ingredients" that comprise the formulated product for sale to the end-user often enhance the toxicity and synergisms of the active ingredient. Researchers examined a "total of 42 formulated pesticides, including one herbicide and one fungicide. They were assayed for acute spray toxicity to 4–6-d-old workers. Results showed significantly variable toxicities among pesticides, with LC50s ranging from 25 to thousands of mg/liter. Further risk assessment using the field application concentration to LC1 or LC99 ratios revealed the risk potential of the 42 pesticides. Three pesticides killed less than 1% of the worker bees, including the herbicide, a miticide, and a neonicotinoid. Twenty-six insecticides killed more than 99% of the bees, including commonly used organophosphates and neonicotinoids. The remainder of the 13 chemicals killed from 1–99% of the bees at field application rates. This study reveals a realistic acute toxicity of 42 commonly used foliar pesticides. The information is valuable for guiding insecticide selection to minimize direct killing of foraging honey bees, while maintaining effective control of field crop pests."(Zhu, 2015)

Real-world residue data indicates that bees are exposed to a multitude of pesticides in the field. These exposures could have a layering or additive effect on bees. Furthermore, studies note that some pesticide combinations (for example Demethylation Inhibitor fungicides combined with either pyrethroid or neonicotinoid insecticides) can increase toxicity synergistically. (Wachendoorff, 2012; Andersch, 2010; Johnson, 2013)

The previous Federal administration's action plan encouraged best management practices to "minimize harm to pollinators from pesticide use." However, thus far there are no overarching federal strategies outlining measures for preventing pesticides from contaminating future pollinator habitat on public or private lands. Similar to the action taken by the U.S. Fish and Wildlife Service that halted the use of neonicotinoid use on refuge lands, the use of high risk pesticides should be eliminated on lands designated for conservation.

The naïve reliance on MP3 recommendations does not equal regulation, funded mandates, and complete product research prior to releasing these chemicals into the ecosystem.

Native Pollinators

Wild bee populations are also in decline across many landscapes. (Koh, 2015) Research indicates that wild bees are at particular risk from insecticide applications at different times than managed pollinators. (Park, Mia, 2015) Wild pollinators are most affected by pesticides after plant bloom periods, as they continue to forage in and around pesticide-treated areas after managed colonies have moved on. Other data suggests that certain bee species are more sensitive to pesticides than honey bees. (Rundolf, 2015) Rundolf et al. (2015) reports that pesticide coated seed plantings reduce wild bee density, solitary bee nesting, and bumble bee colony growth and reproduction under field conditions. The authors here conclude that "pesticide effects on honey bees cannot always be extrapolated to wild bees."

There are approximately 4,000 species of native bees in North America, (Vaughan, 2015) and differences in behavior and biology across species give rise to unique exposure risks. For instance, 70 percent of native bee species in the United States have ground/soil nests Vaughan, 2015) where they come into contact with pesticide residues, especially in agricultural regions. Wild bees contribute more than $3 billion to the U.S. agricultural economy Losey, 2006) providing pollination services in the presence and absence of managed honey bees. In fact, diverse pollinator communities, comprising honey bees, wild bees, and other insect pollinators, synergistically increase pollination services through species interactions and pollination effectiveness. Brittain, 2013)

By harming pollinators like bees and butterflies, and natural pest control agents like birds and beneficial insects, neonicotinoids are sabotaging the very organisms on which farmers depend. Hundreds of recent studies detail the effects on birds, butterflies, earthworms, and a wide range of terrestrial and aquatic invertebrates—effects that occur when the chemicals are applied as directed.

Much of the harm is indirect. Elevated levels of these chemicals in many surface and ground waters are already high enough to kill the aquatic invertebrate life on which many birds, bats, and other pollinators rely on for food sources. (Hladik, 2014; Hallmann, 2014)

Researchers Kessler et al. "found that rather than avoid pesticide-laced nectar when given a choice, as predicted by some researchers, in fact both honeybees and bumblebees preferred solutions containing imidacloprid or thiamethoxam to uncontaminated sugar water. Furthermore, bees consuming the pesticides ate less food overall, affecting their condition and survival. In the case of imidacloprid, they continued to show a preference for the pesticide-laced solution, even though they were more likely to die. To get to the bottom of this, the team examined how the bees reacted to the taste of the toxins. Normally, such chemicals should stimulate taste nerves that register bitterness. However, the results showed no response from the 'bitter-sensing' neurons to any of the three neonicotinoids. This suggests that the bees cannot taste these pesticides in nectar. These results are worrying because they suggest that foraging bees may not only endanger themselves but also bring back more neonicotinoid-laced food to the colony. Strategies such as planting flowers in field margins may not reduce the risks of pesticide poisoning for bees." (Science for Environmental Policy)

When examining the relationship to pollinators in the real-world of agriculture the use of pesticides does not stop at the manufacturers' door, or even the label on the bag of coated seeds or liquid pesticide. As bee health continues to suffer, as bees are unable to reproduce sufficiently, if more bees die every winter due to sub-lethal levels of pesticides, systemic and non-systemic pesticides, then it is the farmer's crop yield that will also suffer. This relationship in the real-world of agriculture and pesticide use is creating less pollinators, a reduced American honey crop, unsustainable soils, and unsustainable farms.

Conclusion & Recommendation

Beekeepers value their relationships with farmers, ranchers, and specialty crop producers. Beekeepers need to maintain this vitally important connection for the sustainability of agriculture. It is important to bee health to examine all stressors, including pesticides. EPA has misinformed farmers especially to the hazards of pesticides coated on seeds, and allowed long-term chemical contamination of farmland, other crops, surrounding crop and wild lands, waterways, and the ecosystem.

LEAD for Pollinators, Inc, is calling for the revocation of the registration of all neonicotinoid class of pesticides, including removing pesticide coated seeds from the EPA treated article exemption. In addition we encourage EPA to take the following actions to update its pesticide registration regulation process through the following recommendations:

1. Revise pesticide registration regulations to take into account all pesticide ingredients (active, inert and adjuvant) and their effects on the environment.
2. Revise pesticide registration regulations to require whole pesticide formulation and tank mixture testing to take into account synergistic effects.
3. Revise pesticide registration regulations to require inert ingredients and whole pesticide formulations testing for chronic toxicological effects and degradation.
4. Revise pesticide registration regulations to require Endangered Species Act (ESA) consultation on the effects of whole pesticide formulations and tank mixtures on threatened and endangered species.
5. Comply with the above requirements in conducting statutorily mandated registration reviews of pesticides.

Formally,

Michele Colopy
Executive Director

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