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Connie Hernandez
Field and External Affairs Division
OPP Docket
Environmental Protection Agency Docket Center (EPA/DC)
(28221T)
1200 Pennsylvania Ave. NW
Washington, DC 20460-0001

Re: Pesticides; Petition Seeking Revised Testing Requirements of Pesticides Prior to Registration; EPA-HQ-OPP-2018-0262

Dear Ms. Hernandez,

Beekeepers value deeply their relationships with farmers, ranchers, and specialty crop producers. Beekeepers need to maintain this vitally important bond for the sustainability of agriculture. It is important to bee health to examine all stressors, including pesticides. Bee health has been in decline and continues to be in decline due to pesticide exposure directly to bees and to their food sources. These pesticide exposures lead to bee diseases and pests taking advantage of weakened bee immune systems. Pollinators make possible the fruits, nuts, vegetables, and seeds we all enjoy. When pollinators are healthy, farming is sustainable, and agriculture is economically strong.

There is a preponderance of literature showing harmful effects to bees and other organisms from neonicotinoid (neonic) pesticides. 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 the use of these neonic pesticides. The Pollinator Stewardship Council is calling for a moratorium on Neonicotinoids for the health of our managed and native pollinators.

The Pollinator Stewardship Council is providing comment on a petition received from the Center for Food Safety requesting EPA take the following actions:

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.

Revise pesticide registration regulations to take into account all pesticide ingredients (active, inert and adjuvant) and their effects on the environment.

The Environmental Protection Agency (EPA) has a duty to ensure the use of all chemical ingredients will not unreasonably adversely affect humanity or the environment. The EPA should require all information from applicants concerning mixtures and co-application of ingredients before reaching any decision to allow new, additional or continued uses of these chemicals. The EPA should use this information to implement strict prohibitions and mitigations necessary to avoid the negative consequences on pollinators, water, land, and wildlife, or if those consequences cannot be sufficiently mitigated, to deny the application. The EPA should recommit to a transparent process in which, to the greatest degree possible, the EPA provides information to the public, whether through notice of actions, publication of information (including studies and data) in the dockets, or timely responses to requests under the Freedom of Information Act.

Research shows the application of multiple ingredients does have a synergistic effect for certain combinations of pesticides. (Andersch, et al. 2010; Brittain, et al. 2013; Johnson et al. 2013; Sgolastra, et al; Wachendoorff-Neumann, U. et al. 2012; Zhu, Yu Cheng, et al. 2015) Without expressly requiring applicants to provide information on synergy, it is highly likely that the EPA is underestimating the negative impacts on the environment of pesticide exposure in its analyses. EPA cannot comply with its duty under the Federal Insecticide Fungicide and Rodenticide Act to ensure that its registration of pesticides will not result in unreasonable adverse effects on the environment.[1] The EPA continues to approve more uses of mixtures such as the new approval of the combination of dicamba and glyphosate for use on genetically-engineered crops.

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. [2, 3, 4]

Federal action for protecting pollinators has included amending labels and requiring States 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 however 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)*

Revise pesticide registration regulations to require whole pesticide formulation and tank mixture testing to take into account synergistic effects.

It is imperative that the EPA consider synergistic effects of the formulated pesticide product during its registration and registration review process and include protective label restrictions to eliminate or mitigate adverse, synergistic environmental impacts. The EPA should prohibit tank mixes on the labels unless there is sufficient information demonstrating that no synergistic effects will occur.

In addition to products containing multiple active or inert ingredients that result in synergism, pesticide products can often be mixed or co-applied in the field in a way that results in negative synergistic effects. In the recent pollinator risk assessment for the neonicotinoid, imidacloprid, the EPA noted that this pesticide was often mixed with fungicides in tank mixtures:

> *"fungicides, particularly those of the sterol biosynthesis inhibitor class that include the triazole fungicides were detected with high frequency. There are reports in the literature that these chemicals may exhibit a greater than additive (e.g., synergistic) effect on toxicity when bees are exposed simultaneously with neonicotinoid chemicals like*

> *imidacloprid. While the extent of this relationship is beyond the scope of this assessment, it highlights the complex nature of interactions of different stressors that exist in the hive."*

Because these mixtures have damaging impacts on pollinators and other wildlife, EPA must take into account and act upon this issue when making pesticide registration decisions. All risk assessments should be conducted on formulated products, not simply the active ingredient. The risk assessments of insect growth regulators, fungicides, and common tank mixes need to be reassessed for their negative impact upon brood development. Every year damage to bee hives in the form of brood loss occurs. This unnecessary injury occurs due to the lack of appropriate warning statements on the labels of these products and inadequate testing of the final formulated product.

Revise pesticide registration regulations to require inert ingredients and whole pesticide formulations testing for chronic toxicological effects and degradation.

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." Colonies were monitored for 300 days between March 2007 and January 2008.

EPA, USDA, and pesticide manufacturers treat parasites as the primary cause of pollinator loss. Beekeepers place the blame on pesticide exposures from poorly chosen crop protection products and poorly timed applications of these products. Researchers "investigated how exposing colonies to the parasitic mite Varroa destructor and the neonicotinoid insecticide imidacloprid affect flight capacity of foragers. Flight distance, time and speed of foragers were measured in flight miles to assess the relative and interactive effects of high V. destructor load and a field-realistic, chronic sub-lethal dose of imidacloprid. Foragers from colonies exposed to high levels of V. destructor flew shorter distances, with a larger effect when also exposed to imidacloprid . . .The findings contribute to an understanding of interacting stressors that can explain colony losses. Reduced flight capacity decreases the food-collecting ability of honeybees and may hamper the use of precocious foraging as a coping mechanism during colony (nutritional) stress. Ineffective coping mechanisms may lead to destructive cascading effects and subsequent colony collapse."[5]

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, 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."[6]

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.

In general, wild bee populations are also in decline across many landscapes.[7] Research indicates that wild bees are at particular risk from insecticide applications at different times than managed pollinators.[8] 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.[9] 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.[10] 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,[11] 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[12] 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[13] 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.[14]

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.[15, 16]

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.”[17]

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.

Comply with the above requirements in conducting statutorily mandated registration reviews of pesticides.

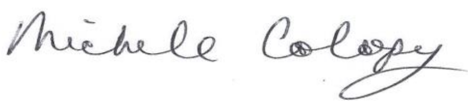
“The call for a reevaluation of pesticide test protocols required for the registration of products is not new (Colin et al. 2004; Halm et al. 2006) These proposed new standards utilize Predicated No Effect Concentration which is determined using chronic and acute toxicity data and not potentially indirect effects of pesticide exposure, such as increased susceptibility to pathogens. With the wide variety of pesticides that have been documented in failing beehives (Mullen et al. 2010), it is imperative that we understand both the synergistic effects these compounds may have and the interactions with other variables, like pathogens, involved in bee health.”[18]

It is imperative the EPA consider synergistic effects of pesticide products during its registration and registration review process, and include protective label restrictions to eliminate or mitigate adverse, synergistic environmental impacts. The EPA should prohibit tank mixes on the labels unless there is sufficient information demonstrating that no synergistic effects will occur. During the risk assessment risk mitigation process, the EPA should candidly engage with all of the stakeholders affected, including beekeepers.

Due to the gaping holes in testing protocol that this petition seeks to address, honey bees and native pollinators are still not protected from the impact of pesticides. Communication across stakeholders has increased, and state pollinator protection plans (MP3s) have been created, but these efforts are best management practices and have no funding support or enforcement to encourage the best management to support the health of pollinators. The naïve reliance on MP3 recommendations does not equal regulation, funded mandates, and complete product research prior to releasing these chemicals into the ecosystem.

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. As The University of Georgia, College of Agricultural and Environmental Sciences states, "For fruit or nut bearing crops, pollination can be a grower's last chance to increase yield. All post pollination inputs, whether growth regulators, herbicides, fungicides, or insecticides, are generally designed not to increase yield but to conserve losses."[19]

Formally,



Michele Colopy, Program Director

<u>Endnotes</u>

[1] 7 U.S.C. § 136a(c)(5).

[2] Wachendoorff et al. 2012

[3] Andersch, W. et al. 2010

[4] Johnson, et al., 2013.

[5] Blanken et al. 2015.

[6] Zhu et al., 2015

[7] Koh, et al. 2015

[8] Park, Mia, et al. 2015

[9] Rundolf, et al. 2015

[10] Rundlöf, et al. 2015

[11] Vaughan, M, Hopwood, J, Mader, EL, et al.. 2015

[12] Ibid

[13] Losey, J.E. and M. Vaughan. 2006.

[14] Brittain, C, Williams, N et al. 2013.

[15] Hladik, M et al. 2014

[16] Hallmann CA, et al. 2014

[17] "Science for Environment Policy": European Commission DG Environment News Alert Service, edited bySCU, The University of the West of England, Bristol. http://pollinatorstewardship.org/wp-content/uploads/2016/01/bees_prefer_feeding_nectar_contaminated_neonicotinoid_pesticides_423na1_en.pdf

[18] Pettis et al., 2012

[19] "Pollinator: a grower's last chance to increase yields," The Univ. of Georgia, College of Agricultural and Environmental Sciences, http://interests.caes.uga.edu/insectlab/agimpact.htm

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