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June 17, 2016

Office of Pesticide Programs (OPP)
Regulatory Public Docket (28221T),
Environmental Protection Agency,
1200 Pennsylvania Ave., NW.,
Washington, DC 20460-0001

Re: Proposed Registration of Sulfoxaflor for Use on Agricultural Crops, Ornamentals and Turf
Docket Number: EPA-HQ-OPP-2010-0889

Dear Sir/Madam,

We are very dismayed that the U.S. Environmental Protection Agency (EPA) has decided to move forward with the registration of the highly bee-toxic insecticide sulfoxaflor. In the aftermath of the Ninth Circuit Court of Appeals decision, which found that sulfoxaflor's 2013 registration was not supported by substantial evidence of no unreasonable harms to honey bees, EPA has reevaluated the registration, restricting applications in attempts to reduce exposure to bees. Specifically, the judge ruled that additional higher tier (Tier II) bee data was needed to fully assess risks, which EPA did not have. Instead of seeking out this information to better assess the long-term risks of sulfoxaflor, the agency has circumvented addressing outstanding data by reducing applications of sulfoxaflor. This new amended registration is for fewer uses, and according to EPA, the proposed restrictions reduce the risk to bees below EPA's level of concern such that no additional data requirements are triggered.

We believe that even with reduced use sites, restricted application timing, and the severe systemic toxicity of sulfoxaflor, these measures will not be adequately protective of honey bees, wild bees, and non-target organisms without eliminating the use of this chemical. Given that beekeepers lost 44 percent of their bee colonies between April 2015 and April 2016,[1] we

[1] Bee Informed. Nation's Beekeepers Lost 44 Percent of Bees in 2015-16 (May 10, 2016) https://beeinformed.org/2016/05/10/nations-beekeepers-lost-44-percent-of-bees-in-2015-16/

again put forward that a sulfoxaflor registration is counterintuitive to current agency and interagency work to protect pollinators. We urge the agency not to move forward with this registration to avoid worsening current problems with bee decline.

In these comments we will also address EPA's proposed mitigation measures: the buffer zone requirement for when there is blooming vegetation bordering the treated field; and the prohibition of tank mixing sulfoxaflor with other pesticides.

Lack of Data Still Persists

EPA claims the amended registration will be "very protective of pollinators," which now allows the chemical's use on fewer crops than were allowed under sulfoxaflor's initial registration. For crops that are attractive to bees, the agency will prohibit sulfoxaflor's use before and during bloom, when EPA believes bees will not be present. Specifically, there are to be no uses on certain bee-attractive crops (*e.g.,* citrus, cotton, cucurbits, soybean and strawberry); prohibition on applications before or during bloom (*e.g.,* canola, stone fruits, pome fruits, *etc*.); and prohibitions on crops grown for seed production (*e.g.,* brassica, bulb vegetables, leafy vegetables, etc.).[2] Conqueringly, crops that rely heavily on managed bee pollination (tree nuts like almonds, cranberries) are still to be treated.

The majority of crops proposed for sulfoxaflor use are "minor crops" according to the EPA. They are:

Barley, triticale, wheat
Turf grass
Brassica leafy vegetables
Bulb vegetables
Leafy vegetables (non-Brassica) and watercress
Leaves of root and tuber vegetables
Root and tuber vegetables
Berries (Grape, Blueberry, Cranberry)
Canola
Fruiting Vegetables (Tomato, Pepper, Eggplant) and Okra
Pome fruit
Ornamentals
Potato
Stone Fruit
Succulent and Dry Beans
Tree nuts and pistachio

Several are foraged by bees and present a risk for direct exposure. EPA indicates that for these crops (berries, fruiting vegetables, tree nuts, etc.), they are harvested before bloom or will be treated after bloom. In EPA's words, *"no exposure (and no risk) is expected on the treated field*

[2] USEPA. 2016. Proposed Registration of Sulfoxaflor for Use on Agricultural Crops, Ornamentals and Turf. Office of Pesticide Programs, Washington DC

to bees because, for crops that are bee-attractive and not harvested before bloom, all applications will be restricted only to periods post-bloom for bee-attractive crops."[3]

The agency ignores however the systemic nature of sulfoxaflor, which allows for residues to contaminate plants over the life of the plant, including pollen, nectar and guttation, as well as soil and water which bees also come into contact. Data from the 2013 registration documents indicated that sulfoxaflor induces high mortality among honey bees from zero to three days post application. Additionally, the high incidence of bee death following short-term exposure from sulfoxaflor factors into the long-term effects on brood and colony health. When all or most of foraging bees are dead within three days of sulfoxaflor exposures, a long-term threat to bee colonies becomes significant. In this latest assessment, EPA rationalizes that sulfoxaflor has a short half-life (approx. 9 days in soil, pollen and nectar) and notes that "the temporal extent of acute and chronic risks beyond the treated field is also limited to relatively short periods of time." A relatively short half-life cannot expunge the extremely high toxicity and bee mortality risks attributed to sulfoxaflor. Bees and other pollinators are still present in treated fields before, during, and after bloom, and will be exposed to lingering residues in soil, water, guttation and plant surfaces. Bees foraging in nearby, adjacent areas are still at elevated risks of sulfoxaflor spraying.

The agency still has not conducted adequate tier II colony level-effects for sulfoxaflor, even though the court ordered these data to be collected. EPA's assumptions about no exposure and no risks in the field, as a result of eliminating uses on certain crops are simply assumptions and are not completely protective. The agency's attempts to mitigate risks to honey bees highlight the real deficiencies in the agency's risk assessment process. Risk assessment approaches have historically underestimated real-world risks and attempts to mitigate adverse impacts with measures that prove insufficient. These risk assessment approaches make determinations that the risks are "reasonable," while failing to take into account numerous circumstances and realities that make honey bees vulnerable to chemical exposures including user failure to adhere to application rate guidelines, and local environmental conditions that may predispose crops, and other plants, to accumulate higher chemical residues, especially in nectar and pollen.

Wild, Native Bees and other Pollinators Ignored

EPA states that a "lack of exposure of bees on the treated field is presumed" due to the application restriction around blooming and harvesting crops. Again, the agency fails to consider wild, native bees and other pollinators in making its determination. 70 percent of native

[3] Ibid

bee species in the U.S. have ground/soil nests[4] where they can come into contact with pesticide residues, especially in agricultural regions. Research indicates that wild bees are at particular risk from insecticide applications at different times to when managed pollinators are at risk.[5] Wild pollinators are most impacted by pesticides after plant bloom periods, as they continue to forage in and around treated areas after managed colonies have moved on. Other data suggests that certain wild bee species are more sensitive to pesticides than honey bees.[6]

It is clear that risks to wild bees both on- and off- field are not a priority to EPA, and they will continue to be impacted by sulfoxaflor's use.

Sulfoxaflor a Public Interest Necessity?

EPA believes that it is in the "public interest to register sulfoxaflor" and notes that farmers have indicated a need for sulfoxaflor and lauded its benefits, even though the product spent little to no time on the market to validate any real-world benefits, except through regional Section 18 requests. Interestingly, EPA notes that these same growers have indicated that current chemical controls, like the neonicotinoid, imidacloprid, is no longer effective against the target pests. EPA has not considered the inevitability of sulfoxaflor's failure against these pests as well. Conversely, EPA ignores the beekeepers who brought the suit against the agency regarding their concerns over the impacts on sulfoxaflor on their livestock and livelihood. EPA continues to choose sides and sideline beekeepers who provide an essential public interest service. The recent survey from Bee Informed shows that bee declines are still unsustainably high.[7] Sulfoxaflor will only serve to compound bee declines, despite the mitigation measures EPA has put forward.

Comments on EPA's Proposed Restrictions**:**

1. A downwind 12-foot on- field buffer when there is blooming vegetation bordering the field

[4] Vaugh, M, Hopwood, J, Mader, EL, et al.. 2015. Farming for Bees: Guidelines for Providing Native Bee Habitat on Farms. The Xerces Society. Available at http://www.xerces.org/wp-content/uploads/2008/11/farming_for_bees_guidelines_xerces_society.pdf

[5] Park, Mia, et al. 2015. Negative effects of pesticides on wild bee communities can be buffered by landscape context. *Proceedings of the Royal Society B.* 282: 1809. http://rspb.royalsocietypublishing.org/content/282/1809/20150299

[6] Rundolf, M, Anderson R, Bommarco, I, et al. 2015. Seed coating with neonicotinoid insecticide negatively affects wild bees. Nature 521:77-80.

[7] Bee Informed. Nation's Beekeepers Lost 44 Percent of Bees in 2015-16 (May 10, 2016) https://beeinformed.org/2016/05/10/nations-beekeepers-lost-44-percent-of-bees-in-2015-16/

According to EPA, "The proposed uses of sulfoxaflor involve ground or aerial foliar spray applications with medium or coarser spray nozzles." Additionally, EPA states, "For all of the proposed uses of sulfoxaflor, acute oral and contact risk to bees which may forage immediately adjacent to the treated field during (or shortly after) application is limited to <1 – 12 feet beyond the treated field," and recommends a spray drift buffer of 12 ft to mitigate acute risks to bees. Does the 12 ft buffer apply to both ground and aerial applications? It seems unimaginable that the agency believes a 12 ft buffer will be sufficient to mitigate aerial spray drift or be protective of foraging bees.

Spray drift is known to travel large distances. Carlsen at al. (2006) detected spray drift up to 150m from the treated site.[8] Previous federal decisions to protect sensitive species have called for larger buffer zones. To protect sensitive fish species, the National Marine Fisheries Service (NMFS) recommended buffer zones of 500 ft for ground spraying and 1000 ft for aerial spraying. NMFS also recommended a 20 ft buffer strip of non-crop vegetation downside from application sites. In response, EPA set a minimum 100 ft buffer to account for potential movement of the pesticide off site through both aerial drift and overland runoff.[9] The Xerces Society, in their report, "Farming and Bees," recommend a buffer zone of at least 25 ft to protect bees foraging along field margins.[10] We believe that these mentioned scenarios that warrant buffer zones indicate that EPA's recommendation is way off the mark. While various factors such as droplet size, nozzle heights etc, can influence the size of buffer zones, a buffer zone of ***at least*** 20 to 50 ft is recommended.

2. Potential Synergistic Effects Related to Tank-Mixes

EPA is requesting comments on whether restrictions on tank-mixing sulfoxaflor are necessary to prevent unreasonable adverse effects. It has been widely documented that pesticides in combination can have an additive, synergistic impact on toxicity.[11,12,13] EPA recently acknowledged the potential risk from the toxic effects associated with the synergistic interactions of the chemical cocktail of 2,4-D and glyphosate (Enlist Duo). However, according

[8] Carlsen SC, Spliid NH, Svensmark B. 2006. Drift of 10 herbicides after tractor spray application. 2. Primary drift (droplet drift). *Chemosphere.* 64(5):778-86.
[9] Letter to James H. Lecky, National Marine Fisheries Services. (Sept 10, 2009) http://www.nmfs.noaa.gov/pr/pdfs/consultations/letter_epa_nmfs.pdf
[10] Vaughan, M, Hopwood, J, Mader, EL et al. 2015. Farming For Bees: Guidelines for Providing Native Bee Habitat on Farms. The Xerces Society for Invertebrate Conservation http://www.xerces.org/wp-content/uploads/2008/11/farming_for_bees_guidelines_xerces_society.pdf
[11] Zhu, W, Schmehl, D, Mullin, C, and J Frazier. 2014. Four common pesticides, their mixtures and a formulation solvent in the environment have a high oral toxicity to honey bee larvae. *PLoS ONE* 9(1)
[12] Sanchez-Bayo F and Goka K. 2014. Pesticide residues and bees--a risk assessment. *PLoS One*. 9(4):e94482.
[13] Corbel V, Stankiewicz M, Bonnet J, Grolleau F, et al. 2006. Synergism between insecticides permethrin and propoxur occurs through activation of presynaptic muscarinic negative feedback of acetylcholine release in the insect central nervous system. *Neurotoxicology*. 27(4):508-19.

to the agency, it does not require studies for tank mixes due to the assumption that synergism does not occur. However, "if there is evidence to suggest that there are potential synergistic effects, EPA may require such data since the current database for the individual chemicals may not provide adequate information on the risk to non-target organisms from such combinations."[14]

Studies note that single-chemical risk assessments are likely to underestimate the impacts of pesticides when mixtures occur.[15] As EPA notes, this presents an uncertainty in assessing risk. Indeed it does, and EPA must either require the relevant data on the interactions between sulfoxaflor and the other active and "inert" ingredients in the tank mixture, or deny tank mixes with sulfoxaflor. Further, the agency must first know what chemicals are used in the mixes before a proper assessment and public comment can be procured.

EPA and industry groups believe that mixing chemicals with different modes of actions will stave off insect resistance and improve manageability of pests. However, the delay is only short-lived and does not have long-term sustainable benefits, especially in light of harms posed to non-targets and the environment. Further, this ineffective strategy is not one that EPA should be promoting. Until more information is known about the synergistic impacts of tank mixes with sulfoxaflor and other chemicals, use should not be allowed

Conclusion

Sulfoxaflor is highly toxic to honey bees according to EPA's ecological assessment, and there are still unanswered toxicological data gaps regarding honey bees, including field studies for assessing colony health. EPA, upon the registrant's request, has circumvented the need for higher tiered studies by eliminating much of the uses for sulfoxaflor, and now believes that the proposed uses will pose no exposure or risk to bees. This couldn't be further from the truth. In EPA's recent imidacloprid assessment, the agency recognized that bees are exposed to bee-toxic pesticides from many routes of exposures including guttation droplets, soil, and surface water. For sulfoxaflor it is being assumed that these exposure pathways are eliminated since sulfoxaflor has a relatively short half-life and limited crop applications. However, this is an assumption that cannot be made lightly. Bees, including the ever ignored wild bees, do visit and forage fields before, during and after bloom in search of water and nesting sites. EPA once again is underestimating the potential impacts of a very highly bee-toxic chemical for limited agro-economic gains.

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[14] USEPA. 2016. Proposed Registration of Sulfoxaflor for Use on Agricultural Crops, Ornamentals and Turf. Office of Pesticide Programs, Washington DC

[15] Laetz CA, Baldwin DH, Collier TK, et al. 2009. The synergistic toxicity of pesticide mixtures: implications for risk assessment and the conservation of endangered Pacific salmon. *Environ Health Perspect*. 117(3):348-53

We are very disappointed that despite the Court ruling, EPA is planning to move forward with sulfoxaflor's registration. Bees and other pollinators will continue to be exposed to unnecessary bee-toxic chemicals, exacerbating the problems faced by an already tenuous honey bee industry and further decimate bee populations. We again urge to agency to forego a sulfoxaflor registration

Sincerely,

Nichelle Harriott
Science and Regulatory Director