March 27, 2023

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Office of Pesticide Programs
Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460-0001

Attention: EPA-HQ-OPP-2010-0889

RE: Sulfoxaflor; New Active Ingredient

Dear Mr. Rosenblatt:

On February 23, 2023, the United States Environmental Protection Agency ("EPA") published a notice of receipt of applications to register new uses of the pesticide sulfoxaflor and request for public comment ("Notice").[1] The Attorneys General of Arizona, California, Hawaii, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, New Mexico, New York, Oregon, Vermont, and Washington (the "Undersigned States") have reviewed the Notice and applications and submit these comments for EPA's consideration.

The Undersigned States occupy a unique position to comment on the proper balance between agricultural pest control and pollinator protection. Together, we account for 29 percent of all national agricultural production and 37 percent of national crop production.[2] We also possess extraordinary natural resources and ecosystems and are home to a variety of threatened and endangered species and critical habitats. These two attributes are also interrelated—billions of dollars' worth of agricultural output relies on insect-mediated pollination.

The public data on sulfoxaflor's environmental effects and EPA's ecological risk assessment for sulfoxaflor clearly establish that sulfoxaflor can have devastating effects on pollinators. The Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA") provides that, to be registered, pesticide uses must "not generally cause unreasonable adverse effects on the environment."[3] Accordingly, in acting on the subject applications to register new sulfoxaflor uses, we urge EPA to adopt reasonable restrictions on sulfoxaflor's use to reduce harmful exposure to pollinators in our states. At minimum, EPA should disallow sulfoxaflor application when crops are blooming where exposure would pose risks to pollinators and re-impose a spray drift buffer requirement.

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[1] Pesticide Product Registration: Sulfoxaflor, EPA Docket ID No. EPA-HQ-OPP-2010-0889-0659; 88 Fed. Reg. 11,437, 11,437-38.
[2] United States Department of Agriculture, Economic Research Service, Farm Finance Indicators (2021), *available at* https://data.ers.usda.gov/reports.aspx?ID=17839 (Value of Agricultural Sector Production by State, $141 billion of $487 billion) (Value of Crop Production by State, $89 billion of $241 billion).
[3] 7 U.S.C. § 136a(c)(5)(C)-(D).

I. Procedural History

FIFRA Section 3 registration of sulfoxaflor uses has a long procedural history, but the details most pertinent to the current application are included here. Corteva—then Dow—originally applied for Section 3 registration for sulfoxaflor products in 2010.[4] In 2013, EPA unconditionally registered sulfoxaflor for a number of uses. Pollinator advocacy groups challenged that registration decision in the U.S. Court of Appeals for the Ninth Circuit, which held in 2015 that EPA's decision was not supported by substantial evidence and vacated the sulfoxaflor registrations.[5]

In 2016, following this first Ninth Circuit decision, EPA re-evaluated the sulfoxaflor registration applications. This time, EPA registered sulfoxaflor, but only for uses that would avoid pollinator exposure.[6] For example, EPA registered sulfoxaflor on crops that are not bee-attractive and on crops that are harvested before bloom. EPA also registered sulfoxaflor for uses on certain bee-attractive crops like stone fruit and tree nuts, but restricted applications to post-bloom only. The 2016 registration decision also imposed strict limitations, including a prohibition on spraying sulfoxaflor within 12 feet of blooming vegetation.

Three years later, without noticing receipt of an application to register new sulfoxaflor uses or soliciting public comment, EPA issued a notice, decision memorandum, and risk assessments registering several new uses of sulfoxaflor.[7] That decision registered sulfoxaflor on certain crops for which the Ninth Circuit vacated registrations in 2015. EPA also removed several pollinator-protective restrictions on all uses of sulfoxaflor, including the ban on applications during bloom and the 12-foot buffer from flowering vegetation.[8]

Pollinator advocacy groups, the Center for Biological Diversity, and the Center for Food Safety challenged this registration decision in the Ninth Circuit. Most of the Undersigned States participated as amici supporting petitioners' arguments that EPA failed to provide proper notice and an opportunity for public comment under FIFRA, and that the agency's actions violated the Endangered Species Act.[9] In late December 2022, the Ninth Circuit held in favor of petitioners

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[4] *Pollinator Stewardship Council*, 806 F.3d 520.
[5] *Id*. at 532.
[6] Registration of Sulfoxaflor for Use on Agricultural Crops, Ornamentals and Turf, EPA Docket ID No. EPA-HQ-OPP-2010-0889-0563.
[7] Decision Memorandum Supporting the Registration Decision for New Uses of the Active Ingredient Sulfoxaflor on Alfalfa, Cacao, Citrus, Corn, Cotton, Cucurbits, Grains, Pineapple, Sorghum, Soybeans, Strawberries and Tree Plantations and Amendments to the Labels, EPA Docket ID No. EPA-HQ-OPP-2010-0889-0570.
[8] *Id.* at 24-27.
[9] Amicus Brief of the States of California, Hawaii, Maryland, Minnesota, New Jersey, New York, New Mexico, Oregon, Vermont, and Washington in Support of Petitioners, *Center for Food Safety v. Reagan*, No. 19-72109 (9th Cir. Sept. 3, 2020), Dkt. No. 40; Amicus Brief of the States of California, Hawaii, Maryland, Minnesota, New Jersey, New York, New Mexico, Oregon, Vermont, and Washington, and the Commonwealth of Massachusetts, in Support of

but declined to vacate the contested sulfoxaflor approvals.[10] Among other things, the court ordered EPA to immediately correct its failure to follow notice and comment procedures on the contested uses.[11] Following this second Ninth Circuit decision, EPA on February 23, 2023, published the Notice seeking comment on the sulfoxaflor uses at issue in the litigation.

II. A Healthy and Sustainable Agricultural Sector Is Critical to Our State Economies and Food Security.

Agriculture is an important part of our state economies. Of all states, California produces the most agricultural output in the United States, with over $51 billion in total cash receipts in 2021.[12] As a group, the Undersigned States' agricultural sectors produced $141 billion in 2021, accounting for 29 percent of national agricultural production.[13] This figure—$141 billion—eclipses the entire gross domestic product of fifteen states.[14] Our crop production is particularly strong, valued at $89 billion in 2021 and 37 percent of the national total.[15] Our states' agricultural sectors boast impressive crop diversity as well—we are the leading national producers of a wide variety of crops, such as apples, almonds, lettuce, hops, beets, tomatoes, coffee, and oranges.[16] One of our states led production for 31 of the 64 crops for which there were data for 2022 in National Agricultural Statistics Service surveys.[17] We take great pride in our key roles in feeding the nation a nutritious and diversified diet. Sustaining our heterogeneous agricultural production is also vital to maintaining national food security and resilience.

Petitioners' Opposition to EPA's Motion for Voluntary Remand Without Vacatur. *Center for Food Safety v. Reagan*, No. 19-72109 (9th Cir. Dec. 7, 2020), Dkt. No. 53-2.

[10] *Center for Food Safety v. Reagan*, 56 F.4th 648 (9th Cir. 2022).

[11] *Id*. at 668-69.

[12] California Department of Food and Agriculture, California Agricultural Production Statistics, available at https://www.cdfa.ca.gov/Statistics/.

[13] United States Department of Agriculture, Economic Research Service, Farm Finance Indicators (2021), *available at* https://data.ers.usda.gov/reports.aspx?ID=17839 (Value of Agricultural Sector Production by State, $141 billion of $487 billion).

[14] United States Department of Commerce, Bureau of Economic Analysis, GDP by State, *available at* https://www.bea.gov/data/gdp/gdp-state.

[15] United States Department of Agriculture, Economic Research Service, Farm Finance Indicators (2021), *available at* https://data.ers.usda.gov/reports.aspx?ID=17839 (Value of Crop Production by State, $89 billion of $241 billion).

[16] United States Department of Agriculture, National Agricultural Statistics Service, Crop Production by State (2022), *available a*t https://quickstats.nass.usda.gov/results/FB108E78-7C17-344F-886B-8699CB31A0F8.

[17] *Id.* (signatory states lead production of almonds, apples, apricots, artichokes, broccoli, cabbage, carrots, cauliflower, celery, coffee, garlic, grapes, hazelnuts, hops, lemons, lettuce, maple syrup, mint, onions, oranges, peaches, pears, safflower, soybeans, spinach, sugar beets, sweet corn, sweet potatoes, tangerines, tomatoes, walnuts).

Given agriculture's importance to our states, the Undersigned States are committed to maintaining a strong and sustainable agricultural sector for the future. This involves protecting the agricultural sector from threats, including from pests and environmental hazards. Our agriculture and pesticide regulation departments take great care to ensure appropriate pest management products and solutions are available for use. We especially stay apprised of the latest non-chemical pest management strategies, as we account for 74 percent of the nation's sales of organic crops.[18] At the same time, we understand the importance of pesticides to many growers and support their judicious use when necessary as part of a responsible and sustainable integrated pest management program.

III. Pollinators Play a Key Role in Supporting Our Agriculture, Economies, and Ecosystems.

Pollinators are essential to our states' ecosystems and economies. Across the United States, managed honeybees contribute over $24 billion to state economies, and more than 2.5 million colonies of managed honeybees are responsible for $15 billion of annual national agricultural output.[19] For example, in California alone, almond growers paid an estimated $365 million for pollination in 2022.[20, 21] Pollination by native bees increases all states' agricultural output by more than $3 billion each year on top of managed bees' contributions, and crop yields increase substantially in areas with denser native bee populations.[22] Our states' natural

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[18] United States Department of Agriculture, National Agricultural Statistics Service, Agricultural Census, Crop Totals, Organic Sales by State (2021), *available at* https://quickstats.nass.usda.gov/results/7800F1E4-17CA-3A74-B757-D0AE389D194A ($4.4 billion of $5.9 billion of total organic crop sales).

[19] Press Release, White House, *Fact Sheet: The Economic Challenge Posed by Declining Pollinator Populations* (June 20, 2014), *available at* https://obamawhitehouse.archives.gov/the-press-office/2014/06/20/fact-sheet-economic-challenge-posed-declining-pollinator-populations ("White House Fact Sheet"); California Department of Pesticide Regulation, *California Neonicotinoid Risk Determination*, at 1 (July 2018), *available at* https://www.cdpr.ca.gov/docs/registration/reevaluation/chemicals/neonicotinoid_risk_determination.pdf.

[20] United States Department of Agriculture, National Agricultural Statistics Service, *Cost of Pollination* (2022), *available at* https://downloads.usda.library.cornell.edu/usda-esmis/files/d504rk335/4q77h245m/3n205b34c/cospol23.pdf, at 8.

[21] The Undersigned States also generate 22 percent of all revenue from honey production nationwide. United States Department of Agriculture, National Agricultural Statistics Service, *Honey* (2022), *available at* https://downloads.usda.library.cornell.edu/usda-esmis/files/hd76s004z/7m01cp956/df65wc389/hony0322.pdf ($69 million of $310 million).

[22] J.R. Reilly et al., *Crop production in the USA is frequently limited by a lack of pollinators*, 287 PROCEEDINGS OF THE ROYAL SOC'Y B, at Abstract (2020), *available at* https://royalsocietypublishing.org/doi/pdf/10.1098/rspb.2020.0922;
Lucas Garibaldi et al., *Mutually beneficial pollinator diversity and crop yield outcomes in small and large farms*, 351 SCIENCE 388, Abstract (2016), *available at*

ecosystems, many of which generate significant tourism revenue,[23] also depend on pollinators—about 80% of wild plants rely on insect-mediated pollination.[24]

Because our economic health and food security depend on robust pollinator populations, we devote significant resources to safeguard pollinators from pesticides and other threats. California, for example, has a comprehensive Managed Pollinator Protection Plan.[25] The Plan includes a system that allows beekeepers to be notified in advance of impending pesticide applications that could harm their bees,[26] integrated pest management techniques that use pesticides only as a last resort,[27] and designated citrus protection areas that prohibit applications of certain pesticides that are toxic to bees during bloom.[28] California's work also extends to

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https://science.sciencemag.org/content/351/6271/388/tab-pdf; John Losey & Mace Vaughan, *The economic value of ecological services provided by insects*, 56 BIOSCIENCE 311, 316 (2006), *available at* https://academic.oup.com/bioscience/article/56/4/311/229003.

[23] *See, e.g.*, United States Department of the Interior, National Park Service, *2021 National Park Visitor Spending Effects* (2022), *available at* https://www.nps.gov/nature/customcf/NPS_Data_Visualization/docs/NPS_2021_Visitor_Spending_Effects.pdf (finding that visitors to national parks alone contributed $42.5 billion in economic output to the national economy, including directly spending an estimated $20.5 billion in local gateway communities).

[24] Jeff Ollerton, et al., *How many flowering plants are pollinated by animals?*, 120 OIKOS 321, 322-23 (2011), *available at* https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1600-0706.2010.18644.x.

[25] California Department of Pesticide Regulation, *California's Managed Pollinator Protection Plan – MP3* (Feb. 2018), *available at* https://www.cdpr.ca.gov/docs/enforce/pollinators/ca_managed_pollinator_protection_plan.pdf.

[26] Cal. Food & Agric. Code §§ 29040, 29042, 29043, 29101, 29102.

[27] *Protecting natural enemies and pollinators*, UNIVERSITY OF CALIFORNIA STATEWIDE INTEGRATED PEST MANAGEMENT PROGRAM, http://ipm.ucanr.edu/mitigation/protect_beneficials.html.

[28] Cal. Code Regs. tit. 3, § 6656.

habitat preservation,[29] public education,[30] and species conservation.[31] Other Undersigned States implement similarly wide-ranging pollinator protection programs[32] and support research on the potential adverse effects of pesticides on pollinators, including from seed treatments.[33]

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[29] *See, e.g.*, *Monarch Butterfly and Pollinator Rescue Program*, CALIFORNIA WILDLIFE CONSERVATION BOARD, https://wcb.ca.gov/Programs/Pollinators (incentives to farmers to plant pollinator-friendly vegetation in hedge rows and buffer strips); *Science: Pollinators*, CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE, https://wildlife.ca.gov/Science-Institute/Pollinators (guides for planting pollinator-friendly home gardens).

[30] *Grower and Beekeeper Collaboration*, CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION, https://www.cdpr.ca.gov/docs/enforce/pollinators/collaboration_brochure.pdf; *Identify Hives and Register Apiary Locations*, CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION, https://www.cdpr.ca.gov/docs/enforce/pollinators/apiary_brochure.pdf; *What Pesticide Applicators Can Do to Help Protect Bees!*, CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION, https://www.cdpr.ca.gov/docs/enforce/pollinators/applicators_flyer.pdf; *What Pest Control Advisers Can Do to Help Protect Bees!*, CALIFORNIA DEPARTMENT OF PESTICIDE REGULATION, https://www.cdpr.ca.gov/docs/enforce/pollinators/advisers_flyer.pdf (educational materials disseminated to farmers and other stakeholders).

[31] *Monarch Butterfly and Pollinator Rescue Program*, CALIFORNIA WILDLIFE CONSERVATION BOARD, https://wcb.ca.gov/Programs/Pollinators (program for monarch butterfly conservation); California Fish and Game Commission, Notice of Findings, Crotch Bumble Bee (Bombus crotchii), Franklin's Bumble Bee (Bombus franklini), Suckley Cuckoo Bumble Bee (Bombus suckleyi), and Western Bumble Bee (Bombus occidentalis occidentalis) (June 18, 2019), https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=170351&inline (designating four species of bumble bees as candidate species under the California Endangered Species Act).

[32] *See, e.g.*, Md. Code. Agric. § 2-1801 (requiring Maryland agencies to publish and abide by pollinator habitat plans which require the use of pollinator-promoting best management practices and bar the use of pollinator-toxic pesticides except as required to protect public health); New York State Department of Environmental Conservation, *New York State Pollinator Protection Plan* (June 24, 2016), *available at* https://www.dec.ny.gov/docs/administration_pdf/nyspollinatorplan.pdf (outlining best management practices to protect native and managed pollinators; opportunities to expand and improve pollinator habitat; areas for research, including the impact of pesticides on New York's pollinators; and avenues for outreach and education); New York State Department of Environmental Conservation, *2020 New York State Pollinator Protection Plan Update* (2020), *available at* https://agriculture.ny.gov/system/files/documents/2021/02/pollinatorreport.pdf; H.B. 539 (Vt. 2016) (enacted) (establishing a Pollinator Protection Committee "to evaluate the causes and occurrence of reduced pollinator populations in the State and recommend measures the State can adopt to conserve and protect pollinator populations"); H.B. 3362 (Or. 2015) (enacted) (declaring a pollinator health emergency and directing the state Department of Agriculture and Oregon State University to develop a pollinator health outreach and education plan that will inform the public about best practices and other measures to reduce the adverse effects of pesticides on pollinators).

IV. The Existing Pollinator Crisis Threatens Our States.

Despite these programs, pollinators' contributions to our states' economies and ecosystems are threatened by historically high rates of bee colony loss.[34] Loss estimates for commercial beekeeping operations differ somewhat by survey and methodology, but all show historically elevated rates of colony collapse.[35] For example, a prominent survey conducted by the Bee Informed Partnership reveals average annual losses of entire managed bee colonies of 39.2 percent from 2011 to 2022.[36] Losses in winter—a common time for colony loss and a historical measure of managed bee health—averaged 27.4 percent from 2008 to 2022,[37] far above historical averages of 10-15 percent.[38] Although beekeepers, agricultural operators, and regulators have improved risk mitigation practices as awareness of the pollinator crisis has grown, loss rates have remained stubbornly high in recent years.[39]

Studies of native bee populations are less common, but available data from academic studies suggest potentially catastrophic declines for native bee populations as well, especially in

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[33] *See, e.g.*, Travis A. Grout et al., *Neonicotinoid Insecticides in New York State: Economic Benefits and Risk to Pollinators* (June 23, 2020), https://legacy-assets.eenews.net/open_files/assets/2020/07/08/document_gw_15.pdf.

[34] In other words, the percentage of bee colonies that are entirely destroyed over a given period.

[35] *See, e.g.*, Bee Informed Partnership Loss and Management Survey data, *available at* https://research.beeinformed.org/survey/data_request/1/ ("Bee Informed Partnership Survey data") (reporting state-level annual, summer, and winter colony loss data); United States Department of Agriculture, National Agricultural Statistics Service, *Honey Bee Colonies* (2022), *available at* https://downloads.usda.library.cornell.edu/usda-esmis/files/rn301137d/kh04fx05c/qb98nn582/hcny0822.pdf; (2021), *available at* https://downloads.usda.library.cornell.edu/usda-esmis/files/rn301137d/8g84nk42x/00000x890/hcny0821.pdf; (2020), *available at* https://downloads.usda.library.cornell.edu/usda-esmis/files/rn301137d/nc5819380/t148g6070/hcny0820.pdf (reporting state- and national-level colony loss data on a quarterly basis).

[36] Figure derived from Bee Informed Partnership Survey data. Average annual losses calculated by dividing the total colonies lost by the total colonies at risk (totals calculated by summing across all states for which there were data), leaving multi-state operations out of individual state results (but including them separately—i.e., the "MSO out" data). This methodology of calculating average national losses appears to have been the preferred methodology used by the peer-reviewed publications of Bee Informed Partnership survey results. *See, e.g.*, Selina Bruckner, et al., *A national survey of managed honey bee colony losses in the USA: results from the Bee Informed Partnership for 2017–18, 2018–19, and 2019–20*, JOURNAL OF APICULTURAL RESEARCH (2023).

[37] Bee Informed Partnership Survey data.

[38] White House Fact Sheet.

[39] Bee Informed Partnership Survey data. *Compare, e.g.*, average winter losses from 2008 to 2014 (27.6 percent) to average winter losses from 2015 to 2022 (27.2 percent).

agricultural areas.[40] In addition, a study conducted by the Center for Biological Diversity found that 52 percent (749 of 1,437) of native North American species saw their populations decrease by at least 30 percent between 2002 and 2017.[41] About a quarter of those species were at serious risk of extinction.[42]

Extensive research has identified many factors that contribute to the current pollinator crisis, including extreme weather events,[43] parasites,[44] and pesticides.[45] Studies show correlations between total pesticide exposure over time and colony loss,[46] suggesting that long-term, sub-lethal pesticide exposure contributes to the pollinator crisis.[47] Research has also found that colonies particularly struggle to survive when exposed to multiple pesticides, or to pesticides along with other risk factors like diseases or nutritional stress.[48] It is therefore critical that EPA

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[40] Insu Koh, et al., *Modeling the status, trends, and impacts of wild bee abundance in the United States*, 113 PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES 140, 141-42 (2016), *available at* https://www.pnas.org/content/pnas/113/1/140.full.pdf; Laura Burkle, et al., *Plant-Pollinator Interactions over 120 Years: Loss of Species, Co-Occurrence, and Function*, 339 SCIENCE 1611 (2013), *available at* https://www.science.org/doi/10.1126/science.1232728https://science.sciencemag.org/content/339/6127/1611.

[41] Center for Biological Diversity, *Pollinators in Peril: A Systematic Status Review of North American and Hawaiian Native Bees*, at 1, 3 (Mar. 1, 2017), *available at* https://www.biologicaldiversity.org/campaigns/native_pollinators/pdfs/Pollinators_in_Peril.pdf. There were sufficient data in the study to analyze 1,437 of the 4,337 native North American bee species considered in the study. Insufficient data existed for the 2,900 other North American native bee species—species that are even likelier to be in decline or at risk of extinction because they tend to have smaller baseline populations or be more sensitive to habitat loss or pesticides due to their greater specialization. *Id.* at 5.

[42] *Id*. at 1.

[43] *See, e.g*., Benjamin Besci, et al., *A biophysical approach to assess weather impacts on honey bee colony winter mortality*, 8 ROYAL SOCIETY OPEN SCIENCE 9 (2021).

[44] *See, e.g*., Benjamin Dainat, et al., *Predictive Markers of Honey Bee Colony Collapse*, 7 PLOS ONE 2 (2012).

[45] *See, e.g*., Kirsten Traynor, et al., *Pesticides in Honey Bee Colonies: establishing a baseline for real world exposure over seven years in the USA*, 279 ENVIRONMENTAL POLLUTION 116566 (2021).

[46] *Id*.; Kirsten Traynor, et al., *In-hive Pesticide Exposome: Assessing risks to migratory honey bees from in-hive pesticide contamination in the Eastern United States*, 6 SCIENTIFIC REPORTS 33207 (2016).

[47] Traynor 2021, *supra* n.45.

[48] *Id*.; Laura Straub, et al., *Neonicotinoids and ectoparasitic mites synergistically impact honeybees*, 9 SCIENTIFIC REPORTS 8159 (2019); Julia Grassl, et al., *Synergistic effects of pathogen and pesticide exposure on honey bee (Apis mellifera) survival and immunity*, 159 JOURNAL OF INVERTEBRATE PATHOLOGY 78 (2018).

seek to reduce pollinator exposure to potentially harmful pesticides—including those with only sub-lethal effects—as much as is feasible.[49]

V. Sulfoxaflor Is Highly Toxic to Pollinators.

Under FIFRA, EPA employs a tiered process for determining a pesticide's acute and chronic risk to pollinators.[50] Under tier 1, EPA screens a pesticide product and its use pattern to determine whether it would expose pollinators to potentially harmful levels of the pesticide. Tier 1 studies are laboratory tests that reveal the dose of the pesticide that is sufficient to cause harm to adult bees and larvae through various routes of exposure.[51] If the exposure estimates exceed harmful dose amounts, EPA proceeds to tier 2.[52] At tier 2, the registrant conducts simulated field and residue tests. These studies are designed to evaluate whether pollinators would be affected by exposure to the pesticide at the proposed application rates and timing.[53]

EPA's initial database of sulfoxaflor studies included a handful of tier 1 studies, six tier 2 field studies, and four tier 2 residue studies. The Ninth Circuit previously determined that these studies were insufficient to determine sulfoxaflor's effects on bees.[54] Accordingly, EPA's most recent ecological risk assessment relies on three new tier 2 tunnel studies, two new tier 2 field feeding studies, and thirteen new tier 2 residue studies.[55]

The new tier 2 studies conclusively demonstrate that the active ingredient sulfoxaflor is harmful to bees. The new tunnel studies lasted from 7 to 10 days. All three tunnel studies showed statistically significant increases in bee mortality of up to 20 times the rate found in the control group.[56] Sulfoxaflor also caused changes in flight activity and behavior.[57]

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[49] *See* 7 U.S.C. § 136a(c)(5)(C)-(D).
[50] White Paper in Support of the Proposed Risk Assessment Process for Bees, September 11-14, 2012 ("White Paper"), *available at* http://cues.cfans.umn.edu/old/pollinators/pdf-EPA/EAP-SAP-whitepaper.pdf; Guidance for Assessing Pesticide Risks to Bees, June 19, 2014 ("Guidance"), *available at* https://www.epa.gov/sites/production/files/2014-06/documents/pollinator_risk_assessment_guidance_06_19_14.pdf. For a flow chart illustrating the pollinator risk assessment process, see White Paper, at 38, Fig. 2.
[51] White Paper, at 105-16.
[52] *Id.* at 38, Fig. 2.
[53] EPA's Guidance for Assessing Pesticide Risks to Bees also refers to tier 3 studies, though here EPA waived the requirement for a tier 3 sulfoxaflor study. Sulfoxaflor: Ecological Risk Assessment for Section 3 Registration for Various Proposed New Uses, EPA Docket ID No. EPA-HQ-OPP-2010-0889-0566 ("Ecological Risk Assessment"), at 134.
[54] *Pollinator Stewardship Council v. U.S. E.P.A.*, 806 F.3d 520, 532 (9th Cir. 2015).
[55] Ecological Risk Assessment, at 54, 70, 77.
[56] *Id.* at 72.
[57] *Id.* at 74-77.

The two new tier 2 field feeding studies also showed effects from sulfoxaflor exposure. In one study, bees were continuously fed sulfoxaflor-dosed food for six weeks, and in the other, bees were continuously fed dosed food for 10 days. In both studies, sulfoxaflor caused statistically significant adverse effects across nearly every metric measured. As EPA stated, the 10-day study found that sulfoxaflor "resulted in sustained (and statistically significant, $p < 0.05$) impacts on multiple colony-level endpoints including: colony strength (34%-76% reduction), brood strength (44%-69% reduction), hive weight (20%-25% reduction), honey stores (30%-70% reduction)."[58] That study also found "large increases in adult, pupal and larval bee mortality," and "significant reductions in pollen stores … relative to controls (70%-100%) and overwintering success."[59] Indeed, the study noted an up to 580-fold increase in bee mortality two weeks after feeding. The longer study that lasted six weeks also found significant impacts on essentially every endpoint, including reduced food consumption, colony strength, brood development, food stores, and hive weight.

The tier 2 residue studies, which focus on individual crops, demonstrated that sulfoxaflor use at the labeled application rates exceeded the no observed effect level—and thus presented harms to bees—in 9 of the 12 crop groups considered.[60] In most cases, EPA found that bees would be exposed to many times the amount sufficient to cause significant harm.[61]

EPA's risk assessment also analyzed sulfoxaflor's effects on bees other than honeybees ("non-*Apis* bees").[62] EPA noted reasons to expect that sulfoxaflor would have greater adverse effects on non-*Apis* bees: many non-*Apis* bees are smaller in size and would thus likely suffer more from the same amount of sulfoxaflor exposure; most non-*Apis* bees are solitary nesting species, so the loss of a single nesting adult would have a much greater consequence on reproduction than a single bee from a colony; and non-*Apis* bees tend to have a much smaller foraging range than honey bees, increasing the likelihood that they would be subjected to repeated exposures.[63] EPA considered one manufacturer-submitted study of bumblebees that purported to find no significant effects from sulfoxaflor exposure.[64] However, the study suffered from design flaws[65] such that EPA found it "difficult to establish firm conclusions" about the

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[58] *Id.* at 80-81.
[59] *Id.* at 81.
[60] *Id.* at 87-134.
[61] *Id.* at 106, 131.
[62] *Id*. at 134-42.
[63] *Id.* at 135.
[64] *Id*. at 138-42.
[65] The study separated bumblebees into a control group, a group exposed to sulfoxaflor, and a group exposed to the neonicotinoid imidacloprid. Sulfoxaflor was applied at one-third of its allowed application rate, whereas imidacloprid was sprayed at over thirty times its allowed application rate. *Id.* at 139. In addition, bumblebees in the control and sulfoxaflor groups were kept closed within their colonies until a day after treatment, but bumblebees in the imidacloprid group were sprayed with the pesticide as they were actively foraging. *Id.* at 139-140.

relative sensitivity of honeybees and non-*Apis* bees to sulfoxaflor.[66] Other research published in *Nature* has suggested that sulfoxaflor exposure significantly harms non-*Apis* bees.[67]

Separately from its risk assessment, EPA has published a draft biological evaluation of sulfoxaflor's likely impacts on federally-listed threatened and endangered species under registered conditions of use and approved labels.[68] While the U.S. Fish and Wildlife and National Marine Fisheries Services have the authority to determine whether a pesticide's registered uses comply with the Endangered Species Act, EPA conducts biological evaluations to lend its expertise in pesticides, routes of exposure, and toxicological effects to the wildlife agencies' biological opinions.[69] A biological evaluation considers whether a pesticide registration "may affect" endangered species and critical habitat listed under the Endangered Species Act.[70] If EPA finds that a pesticide registration may affect a listed species or its designated critical habitat, EPA then evaluates whether the registration is "likely to adversely affect" the listed species and its critical habitat.[71] EPA then shares its biological evaluation with the federal wildlife agencies, which determine whether the pesticide registration is likely to jeopardize the continued existence of the listed species or adversely modify the critical habitat.[72] The wildlife agencies also suggest reasonable and prudent alternatives, if any exist, that could avoid such impacts on listed species.

EPA's draft biological evaluation demonstrates that the registered sulfoxaflor uses could have substantial adverse effects on listed species and critical habitat. Notably, EPA found that the registered sulfoxaflor uses may affect 1,104 listed species (65 percent of all listed species), is likely to adversely affect 581 listed species (34 percent), and is likely to jeopardize the continued existence of 119 listed species (7 percent).[73] As to critical habitats, EPA determined that the registered sulfoxaflor uses may affect 384 critical habitat areas (48 percent of all critical habitats), is likely to adversely affect 105 critical habitats (13 percent), and is likely to adversely modify 32 critical habitats (4 percent).[74] The draft biological evaluation indicates that EPA

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[66] *Id*. at 142.
[67] Harry Siviter, et al., *Sulfoxaflor Exposure Reduces Bumblebee Reproductive Success*, 561 NATURE 109 (2018).
[68] Sulfoxaflor DRAFT Biological Evaluation: Effects Determination for Endangered and Threatened Species and Designated Critical Habitats, EPA Docket ID No. EPA-HQ-OPP-2010-0889-0604 ("Draft Biological Evaluation").
[69] 50 C.F.R. § 402.41; *see generally* 50 C.F.R. §402.40-402.48.
[70] *Id*. at 6, 11.
[71] *Id*.
[72] The Endangered Species Act requires federal agencies to "insure that any action authorized, funded, or carried out by such agency… is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of [critical] habitat." 15 U.S.C. §1536(a)(2). *See also* Draft Biological Evaluation, at 6 n. 1 (defining adverse modification).
[73] *Id*. at 12 Table 1-2.
[74] *Id*. at 13 Table 1-3.

intends to work with the registrant to identify mitigation that ensures the registered sulfoxaflor uses are not likely to jeopardize the continued existence of listed species or adversely modify critical habitat.

Overall, the evidence demonstrates that sulfoxaflor exposure can harm pollinators and that the rate and timing of sulfoxaflor applications can affect overall risk. EPA's risk assessment classifies sulfoxaflor as "very highly toxic" to bees,[75] and as reflected in the risk assessment and draft biological evaluation, many sulfoxaflor uses pose substantial risk to bees if not properly mitigated.

VI. EPA Should Impose Reasonable Restrictions on Sulfoxaflor Use to Protect Pollinators.

FIFRA provides that EPA cannot register a pesticide use unless it determines that the pesticide "will perform its intended function without unreasonable adverse effects on the environment," and that "when used in accordance with widespread and commonly recognized practice it will not generally cause unreasonable adverse effects on the environment."[76] These requirements are crucial to ensure that pesticides do not unreasonably harm public health or the environment.

FIFRA requires EPA to balance the environmental harms from the sulfoxaflor uses at issue against the economic benefits from the uses' ability to control crop pests. As outlined above, the Undersigned States collectively account for over a third of the country's crop production. Many of our most lucrative crops, like California almonds, rely heavily on managed bees for pollination. Given these great stakes, we bring unique perspective to determining the proper balance between pollinator protection and pest control here.

In our view, EPA should impose reasonable restrictions on sulfoxaflor use to protect pollinators while maintaining sulfoxaflor uses that would not pose risks to pollinators. As pollinators are most likely to be present when crops are blooming, we encourage the re-imposition of bloom restrictions as sensible mitigation to minimize sulfoxaflor's contribution to the pollinator crisis. Specifically, EPA should not allow sulfoxaflor application during bloom where residue rates exceed risk thresholds, consistent with its 2016 registration decision, which was not litigated. In addition, several of the uses at issue involve indeterminately blooming crops. For these crops, sulfoxaflor use may not be appropriate if mitigation cannot reliably reduce pollinator exposure to sulfoxaflor. EPA should consult with relevant technical experts employed by state pesticide regulators to craft sufficient mitigation and use restrictions to address these potential harms.

EPA should also re-impose a spray drift buffer requirement for applications near blooming vegetation. The 2016 registration decision required a 12-foot buffer on the basis that a "spray drift analysis indicates that the spatial extent of acute risks beyond the treated field is very

[75] Ecological Risk Assessment, at 11.
[76] 7 U.S.C. § 136a(c)(5)(C)-(D).

limited (<1 – 12 feet beyond the treated field)."[77] However, EPA's ecological risk assessment found from tier 1 studies that "the acute risk [level of concern] is exceeded from 16 to 361 feet beyond the edge of the treated field, depending on the application rate and application method."[78] EPA should therefore consider the appropriate buffer distance—in light of its drift analysis, and with further refinement from tier 2 studies—and ensure that the distance chosen is properly informed and supported by its ecological risk assessment.

Relatedly, sulfoxaflor product labels should encourage collaboration with owners of nearby fields to ensure pollinators will not be nearby in the period during and after sulfoxaflor is applied. Communication with adjacent owners is particularly important when those owners employ commercial pollination services, which are critical to crop yields and input costs, as the cost of pollination services increases when colony loss rates are high.

In addition, the Undersigned States request that all mitigation on sulfoxaflor product labels be enforceable. Several labels approved in 2019 replaced certain enforceable mitigation measures with "advisory" pollinator statements. Formalizing all pollinator protections as enforceable mitigation, rather than advisory statements, would allow the Undersigned States to prosecute violators and ensure that the protections achieve their intended effect.

Finally, we encourage EPA to support further research into sulfoxaflor's environmental impacts and to remain vigilant should that research uncover additional harms to sulfoxaflor's registered uses to any species, pollinator or not. For example, the California Department of Pesticide Regulation monitors sulfoxaflor concentrations in California surface waters.[79] In addition, some studies have suggested that neonicotinoids may have long-term impacts on mammals.[80] Mounting evidence demonstrates that pesticides may have substantial sub-lethal impacts on bee colonies, and many environmental pollutants are well known to cause long-term adverse human health and environmental effects. EPA should therefore remain open to additional sulfoxaflor registration restrictions if further investigation indicates likely sub-lethal environmental effects or harm from repeated exposures that are not captured by the standard studies performed to support FIFRA registration.[81]

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[77] EPA Docket ID No. EPA-HQ-OPP-2010-0889-0563, at 5 (emphasis in original omitted).
[78] Ecological Risk Assessment, at 66.
[79] *See* California Department of Pesticide Regulation, *Determination of 67 pesticides in Surface Water by Triple Quadrupole Mass Spectrometry (LC-MS/MS)* (2020), *available at* https://www.cdpr.ca.gov/docs/emon/pubs/anl_methds/emon_sm_05-49.pdf.
[80] *See, e.g.*, Carmen Costas-Ferreira & Lilian Faro, *Neurotoxic Effects of Neonicotinoids on Mammals: What Is There beyond the Activation of Nicotinic Acetylcholine Receptors?—A Systematic Review*, 22 INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES 8413 (2021); Elise Berheim, et al., *Effects of Neonicotinoid Insecticides on Physiology and Reproductive Characteristics of Captive Female and Fawn White-tailed Deer*, 9 SCIENTIFIC REPORTS 4534 (2019).
[81] *See* 40 C.F.R., Part 155, Subpart C (EPA registration review procedures).

VII. Conclusion

The Undersigned States are committed to protecting our states' economies and ecosystems. We rely on pollinators, which are already threatened by an ongoing crisis. Because sulfoxaflor is highly toxic to pollinators, its unmitigated use presents serious concerns for our state interests. We therefore support reasonable restrictions on sulfoxaflor's use, such as bloom restrictions and buffers, that balance farming operations' need for adequate pest control with the imperative to prevent further harm to pollinators. Consistent with FIFRA's requirements, we urge EPA to approve only responsible uses of sulfoxaflor, with strict mitigation, to ensure the approved uses will not cause unreasonable adverse environmental effects.

Sincerely,

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