

No. 24-1068

IN THE
Supreme Court of the United States

MONSANTO COMPANY,
Petitioner,

v.

JOHN L. DURNELL,
Respondent.

**On Writ of Certiorari to the
Missouri Court of Appeals**

**BRIEF OF FARMER AND FARMWORKER
GROUPS AS *AMICI CURIAE* SUPPORTING
RESPONDENT**

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CORPORATE DISCLOSURE

Amici curiae do not issue stock and have no parent corporations.

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Cases

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Regulations

7 C.F.R. § 205.2	20
7 C.F.R. § 205.202(b)	20

Other Sources

Adam S. Davis & George B. Frisvold, <i>Are Herbicides a Once in a Century Method of Weed Control?</i> , 77 Pest Mgmt. Sci. 2209 (2017), https://perma.cc/D6QA-TLYB	12, 21
Alexandra R. Golt & Lisa J. Wood, <i>Glyphosate-Based Herbicides Alter the Reproductive Morphology of Rosa Acicularis (Prickly Rose)</i> , 12 Frontiers Plant Sci. (2021), https://perma.cc/X5Y5-MDQB	23

- Anja Weidenmüller et al., *Glyphosate Impairs Collective Thermoregulation in Bumblebees*, 376 *Sci.* 6597 (2022), <https://perma.cc/6354-HT2P>24
- Annie Edwards & Margaret Smither-Kopperl, *Termination Timing for Cover Crops Using a Roller Crimper in California’s Central Valley – One Year Demonstration Results*, U.S. Dep’t of Agric. (Mar. 2024), <https://perma.cc/8P8S-YM23>16
- B. Strandberg et al., *Effects of Glyphosate Spray-Drift on Plant Flowering*, 280 *Env’t Pollution* (2021), <https://perma.cc/9SES-Z6NU>23
- Bayer, *Technology Use Guide* (2025), <https://perma.cc/LR35-74YP>17, 29, 30
- Brian D. Curwin et al., *Pesticide Dose Estimates for Children of Iowa Farmers and Non-Farmers*, 105 *Env’t Rsch.* 307 (2007), <https://perma.cc/8HF7-6E3C>26
- Carly Hyland et al., *Examination of Urinary Pesticide Concentrations, Protective Behaviors, and Risk Perceptions Among Latino and Latina Farmworkers in Southwestern Idaho*, 255 *Int’l J. Hygiene & Env’t Health* (2024), <https://perma.cc/53AG-GNE9>28

- Carly Hyland et al., *Mixed-Methods Assessment of Farmworkers' Perceptions of Workplace Compliance with Worker Protection Standards and Implications for Risk Perceptions and Protective Behaviors*, 29 J. Agromed. 355 (2024), <https://perma.cc/J7XN-UXN5>.....25
- Catherine C. Lerro et al., *Dicamba Use and Cancer Incidence in the Agricultural Health Study: An Updated Analysis*, 49 Int'l J. of Epidemiology 1326 (2020), <https://perma.cc/MEQ3-5BFL>28
- Chandra L.-M. Montgomery et al., *Efficacy, Crop Response, and Economics of Alternatives to Glyphosate for Pre-Plant Weed Control in Small Grains*, 7 Agrosys. Geoscis. & Env't (2024), <https://perma.cc/S76R-PF7Q>10
- Christine G. Parks et al., *Rheumatoid Arthritis in Agricultural Health Study Spouses: Associations with Pesticides and Other Farm Exposures*, 124 Env't Health Perspectives 1728 (2016), <https://perma.cc/M6EY-6MX8>25
- Christopher Landau et al., *The Silver Bullet That Wasn't: Rapid Agronomic Weed Adaptations to Glyphosate in North America*, 2 PNAS Nexus (2023), <https://perma.cc/W8A7-ZZWL>12, 13
- Clifford Koger et al., *Rice (Oryza sativa) Response to Drift Rates of Glyphosate*, 61 Pest Mgmt. Sci. 1161 (2005), <https://perma.cc/YK65-2J8V>19

- Cynthia L. Curl et al., *The Effect of Pesticide Spray Season and Residential Proximity to Agriculture on Glyphosate Exposure Among Pregnant People in Southern Idaho, 2021*, 131 *Env't Health Perspectives* (2023), <https://perma.cc/QNF5-4FBY>27
- D. Scott & R.P. Freckleton, *Crop Diversification and Parasitic Weed Abundance: A Global Meta-Analysis*, 12 *Nature Sci. Reps.* No. 19413 (2022), <https://perma.cc/X2ZM-JGPP>14
- David A. Mortensen & Richard G. Smith, *Confronting Barriers to Cropping System Diversification*, 4 *Frontiers in Sustainable Food Sys.* (2020), <https://perma.cc/YB4L-ER2B>15
- David J. Carpenter et al., *Effects of Herbicide on Flowering*, 39 *Env't Toxicology & Chem.* 1244 (2020), <https://perma.cc/6G65-N72N>.....23
- Ellena Soule-Siler et al., *Pesticide Biomonitoring Report-Back Preferences of Pregnant Agricultural Workers in California: Findings from Focus Groups*, 4 *Env't Rsch.: Health* (2026), <https://perma.cc/WM77-VXXN>26
- Emmett Reynier & Edward Rubin, *Glyphosate Exposure and GM Seed Rollout Unequally Reduced Perinatal Health*, 121 *Proc. Nat'l Acad. Scis.* (2025), <https://perma.cc/GX6R-JNB9>.....27

- Env't Protection Agency, *Understanding Global Warming Potentials* (Dec. 29, 2025), <https://perma.cc/8FFR-TXHW>32
- Eric Lipton, *Crops in 25 States Damaged by Unintended Drift of Weed Killer*, N.Y. Times (Nov. 1, 2017), <https://perma.cc/9MKT-ZXT3>21
- Erick V.S. Motta, Kasie Raymann & Nancy A. Moran, *Glyphosate Perturbs the Gut Microbiota of Honey Bees*, 115 Proc. Nat'l Acad. Sci. 10305 (2018), <https://perma.cc/A37Y-JMVH>24
- Eun Shil Cha et al., *Paraquat Application and Respiratory Health Effects Among South Korean Farmers*, 69 Occupational Env't Med. 398 (2012), <https://perma.cc/4TGG-5SRK>28
- Gourav Sharma et al., *Crop Diversification for Improved Weed Management: A Review*, 11 Agric. No. 461 (2021), <https://perma.cc/8C57-2DTF>14, 15
- Graham Brookes, *Genetically Modified (GM) Crop Use 1996–2020: Environmental Impacts Associated with Pesticide Use Change*, 13 GM Crops & Food 262 (2022), <https://perma.cc/DT9D-2ZP9>12
- Gustavo Camargo Silva & Muthukumar Bagavathiannan, *Mechanisms of Weed Suppression by Cereal Rye Cover Crop: A Review*, 115 Agronomy J. 1571 (2023), <https://perma.cc/C6X2-7ZDE>16

- H. Claire Brown, *Attack of the Superweeds*,
N.Y. Times Mag. (June 15, 2023),
<https://perma.cc/83LD-UGR7>13
- Ian Heap & Stephen O. Duke, *Overview of
Glyphosate-Resistant Weeds Worldwide*, 74
Pest Mgmt. Sci. 1040 (2018),
<https://perma.cc/UH4U-8JF3>10, 12
- Irene Navarro et al., *Occurrence of Pesticide
Residues in Indoor Dust of Farmworker
Households Across Europe and Argentina*,
905 Sci. Total Env't (2023),
<https://perma.cc/94U3-UJH8>.....26
- J.R. Reilly et al., *Crop Production in the USA
Is Frequently Limited by a Lack of
Pollinators*, 2020 Proc. Royal Soc'y B 287
(2020), <https://perma.cc/2HEQ-ESLC>22
- Jackie Pucci, *The War Against Weeds Evolves
in 2018*, CropLife (Mar. 20, 2018),
<https://perma.cc/P5UZ-U94F>.....12
- James M. MacDonald et al., *Concentration
and Competition in U.S. Agribusiness*,
USDA Econ. Rsch. Serv. 15 (June 2023),
<https://perma.cc/Y7AV-VTVX>.....30
- Jane A. Hoppin et al., *Chemical Predictors of
Wheeze Among Farmer Pesticide
Applicators in the Agricultural Health
Study*, 165 Am. J. Respiratory Critical
Care Med. 683 (2002),
<https://perma.cc/LB66-YW84>.....28

- Katherine J. Turo et al., *Insufficient Pollinator Visitation Often Limits Yield in Crop Systems Worldwide*, 8 *Nature Ecol. & Evolution* 1612 (2024), <https://perma.cc/E6XE-MDKK>22
- Kimberly C. Paul et al., *Agricultural Paraquat Dichloride Use and Parkinson's Disease in California's Central Valley*, 53 *Int'l J. Epidemiology* (2024), <https://perma.cc/HH53-9BTX>27
- Kimmo Kaakinen et al., *Bumblebees (*Bombus Terrestris*) Forage on Plants Treated with Glyphosate-Based Herbicides Despite Potential Behavioral Consequences*, 286 *Env't Rsch.* (2025), <https://perma.cc/F8Z9-RK92>23
- Laura E. Balis et al., *Midwestern Specialty Crop Impacts on the Environment and Health: A Scoping Review*, 13 *Agric. & Food Sec.* (2024), <https://perma.cc/R74F-5HSA>32
- Laura Vincent-Caboud et al., *Overview of Organic Cover Crop-Based No-Tillage Technique in Europe: Farmers' Practices and Research Challenges*, 7 *Agric.* (2017), <https://perma.cc/KL88-W8D6>17
- Lucas Battisti et al., *Is Glyphosate Toxic to Bees? A Meta-Analytical Review*, 767 *Sci. Total Env't* (2021), <https://perma.cc/BUU4-SRWR>22

- Madhav Dhakal et al., *Cover Crop Management Strategies Affect Weeds and Profitability of Organic No-Till Soybean*, 39 *Renewable Agric. & Food Sys.* (2024), <https://perma.cc/3N7Y-DN6E>.....17
- Marcelo P. Gomes et al., *Alteration of Plant Physiology by Glyphosate and Its By-product Aminomethylphosphonic Acid: An Overview*, 65 *J. Experimental Botany* 4691 (2014), <https://perma.cc/9EEJ-TPB9>.....19
- Matthew R. Ryan et al., *Potential Synergistic Effects of Cereal Rye Biomass and Soybean Density on Weed Suppression*, 59 *Weed Sci.* 238 (2011), <https://perma.cc/99VF-M334>16
- Michael Langemeier, *Conventional and Organic Enterprise Net Returns*, Dep't of Agric. & Consumer Econ., Univ. of Ill. Urbana-Champaign (July 3, 2024), <https://perma.cc/2FU4-C3WN>20
- Nian-Feng Wan et al., *Global Evidence that Plant Diversity Suppresses Pests and Promotes Plant Performance and Crop Production*, 10 *Nature Ecol. & Evolution* 293 (2026), <https://perma.cc/63M8-5BR5>.....14
- Paul Harris, *Monsanto Sued Small Farmers to Protect Seed Patents – Report*, *Guardian* (Feb. 12, 2013), <https://perma.cc/4LQS-FJXX>.....31

- Qi-Hua Luo et al., *Effects of a Commercially Formulated Glyphosate Solutions at Recommended Concentrations on Honeybee (Apis Mellifera L.) Behaviors*, 11 Nature Sci. Repts. (2021), <https://perma.cc/ACL2-AG2Y>24
- Ramdas Kanissery et al., *Glyphosate: Its Environmental Persistence and Impact on Crop Health and Nutrition*, 8 Plants 499 (2019), <https://perma.cc/YCX6-4UQC>19
- Ren-Yu Qu et al., *Where Are the New Herbicides?*, 77 Pest Mgmt. Sci. 2620 (2021), <https://perma.cc/4C82-BMHY>10
- Ricardo Alcántara-de la Cruz et al., *Thirty Years of Glyphosate-Resistant Crops and Weeds: Current Situation and Future Prospects*, 2026 Pest Mgmt. Sci. (2026), <https://perma.cc/2QNP-FP3C>9, 11
- Robert Willmott et al., *Potential of Cover Crop Use and Termination with a Roller-Crimper in a Strip-Till Silage Maize (Zea mays L.) Production System in the Central Valley of California*, 15 Agronomy (2025), <https://perma.cc/HMK5-WGUT>16
- Sharon Raszap Skorbiansky et al., *Rising Consumer Demand Reshapes Landscape for U.S. Organic Farmers*, U.S. Dep't of Agric. (Nov. 14, 2023), <https://perma.cc/ZPY7-WUT2>19

- Sheldon Krimsky, *Can Glyphosate-Based Herbicides Contribute to Sustainable Agriculture?*, 13 *Sustainability* (2021), <https://perma.cc/6AJ9-DZTN>.....15
- Stefano Menegat, Alica Ledo & Reyes Tirado, *Greenhouse Gas Emissions from Global Production and Use of Nitrogen Synthetic Fertilisers in Agriculture*, 12 *Nature Sci. Reps.* (2022), <https://perma.cc/SMX7-VNML>.....32
- Thomas C. Mueller & Lawrence E. Steckel, *Dicamba Volatility in Humidomes as Affected by Temperature and Herbicide Treatment*, 33 *Weed Tech.* 541 (2019), <https://perma.cc/6GDG-PGLS>21
- Timothy M. Bowles et al., *Long-Term Evidence Shows that Crop-Rotation Diversification Increases Agricultural Resilience to Adverse Growing Conditions in North America*, 2 *One Earth* 284 (2020), <https://perma.cc/CEJ4-ZR6E>33
- U.S. Dep't of Agric., 2022 Census of Agriculture (2024), <https://perma.cc/ASX5-9Q93>19
- Vicky C. Chang et al., *Glyphosate Exposure and Urinary Oxidative Stress Biomarkers in the Agricultural Health Study*, 115 *J. Nat'l Cancer Inst.* 394 (2023), <https://perma.cc/S9D2-K59Y>25

- Wei Ding et al., *Biological Response of Soybean and Cotton to Aerial Glyphosate Drift*, 25 J. Crop Improvement 291 (2011), <https://perma.cc/WF2X-US6W>18
- Y.L. Dupont et al., *Effects of Herbicide and Nitrogen Fertilizer on Non-Target Plant Reproduction and Indirect Effects on Pollination in *Tanacetum Vulgare* (Asteraceae)*, 262 Agric., Ecosys. & Env't 76 (2018), <https://perma.cc/ML2V-7EYN>23
- Yaqun Yuan et al., *High Pesticide Exposure Events and Subjective Cognitive Complaints Among US Farmers*, 293 Env't Rsch. (2026), <https://perma.cc/N6LZ-G9BE>.....25

INTEREST OF *AMICI CURIAE*¹

Amicus Centro de los Derechos del Migrante (CDM) is a transnational nonprofit organization that protects the rights of migrant workers under U.S. law. Since its founding in 2005, CDM has worked with thousands of farmworkers, including by providing legal services and conducting outreach and education regarding health and community resources.

Amicus Dakota Resource Council (DRC) works to make rural communities sustainable by putting people first. In 2025, DRC members resolved to advocate for laws which protect farmers', workers', and ordinary people's rights to seek justice and hold pesticide companies accountable for health impacts related to pesticide exposure.

Amicus Dakota Rural Action (DRA) has long supported the ideals of local control, including the ability of government that is closer to the people to create and implement regulations matching the particular needs of its community. DRA supports the environmental sustainability of agricultural systems and products and holding companies accountable for negative impacts of their products on those systems.

Amicus Farm Action is a nonpartisan, farmer-led organization representing independent farmers and rural communities. Through research, education, and policy engagement, Farm Action works to promote fair and competitive agricultural markets and has a

¹ No counsel for a party authored this brief in whole or in part, and no person other than amici or their counsel made a monetary contribution to this brief's preparation and submission.

strong interest in ensuring accountability for harms affecting farmers and agricultural production.

Amicus Family Farm Defenders (FFD) is a national farmer-led organization with over 3,000 members across all fifty states, with the majority in the Midwest. Founded in 1994, FFD's mission is to build a broad grassroots movement to establish a fair, just, and resilient agricultural system rooted in food sovereignty, agro-ecology, peace, and international solidarity.

Amicus Friends of Family Farmers is a nonprofit whose mission is to advance policies and programs that protect, promote, and sustain resilient and economically viable community agricultural systems in Oregon. Friends of Family Farmers does farmer-led policy work at the state level and runs several programs in support of small and mid-sized farms.

Amicus FrontLine Farming is a Colorado-based, farmer-led nonprofit operating multiple production sites and leading statewide efforts to strengthen local agriculture. FrontLine Farming joins this amicus brief because protecting farmers and farmworkers from pesticide-related harms is essential to agricultural viability. Through its farming and worker advocacy, FrontLine Farming has witnessed how exposure to chemicals like glyphosate impacts health, soil integrity, and long-term productivity, undermining the resilience of local and regional food systems.

Amicus HEAL (Health, Environment, Agriculture, Labor) Food Alliance is a national coalition of 62 organizations, including several representing farmworkers, farmers, and food chain workers disproportionately impacted by agricultural harms. Many of HEAL's members represent workers who face

exposure to agrichemicals, and others represent small farmers who employ sustainable practices.

Amicus the Idaho Organization of Resource Councils (IORC) brings people together to promote health, safety, dignity, and justice for frontline communities, including farmworkers. IORC fights for the protection of farmworkers from pesticide poisoning, including by opposing state legislation which would immunize companies like Monsanto from liability for claims like Petitioner's.

Amicus Illinois Stewardship Alliance (ISA) is a statewide, membership-based nonprofit that unites farmers, eaters, and food system leaders to promote just, regenerative agriculture and transparent food and farm policies. ISA advocates for the disclosure of pesticide risks so farmers, farmworkers, and communities can protect their health, livelihoods, and safety.

Amicus Institute for Agriculture and Trade Policy (IATP) is a 39-year-old Minnesota-based organization that works locally, nationally, and internationally for fair and sustainable food, farm, and trade systems. IATP conducts research and policy analysis supporting family farmers and rural communities, focusing on the harms of excess corporate power in the food system including the farm input sector.

Amicus Land Stewardship Project (LSP) is a member-based organization of farmers, rural community members, and supporters who work to make sure the voices and concerns of farmers are heard. LSP's members include farmers who are exposed to glyphosate, have experienced glyphosate-resistant weeds, or grow crops without using glyphosate.

Amicus the National Family Farm Coalition

(NFFC) is a nationwide nonprofit that represents farmers and ranchers from 31 grassroots member organizations in 42 states. NFFC's members work to address the negative effects of corporate consolidation and economic concentration in the food and farm system.

Amicus National Sustainable Agriculture Coalition (NSAC) brings together 170 organizations and their combined 2+ million members to advocate for federal policy that builds sustainable, resilient, and equitable ecosystems and communities. Many of NSAC's members represent farmers who do not use glyphosate due to concerns about potential adverse health, environmental, or agronomic impacts, or because they are certified organic.

Amicus Organic Farmers Association provides a strong and unified national voice for domestic certified organic producers in Washington, D.C. Organic production systems support a healthier planet for the benefit of all life, and certified organic farmers farm successfully without the use of glyphosate to protect human health and preserve ecosystems.

INTRODUCTION AND SUMMARY OF ARGUMENT

Monsanto and its amici contend that holding Monsanto accountable for failing to warn users about its products' dangers will spell disaster for American farming. *See, e.g.*, Pet. Br. 3, 50–53; Nat'l Agric. Ass'ns Amici Br. 7; State Farm Bureaus Amici Br. 5–10. This “handwringing over” what a ruling for respondent would mean for farmers is no reason to reverse. Resp't Br. 25. It is instead a collection of “policy arguments” against providing the victims of

Monsanto’s tortious conduct with a remedy, which “belong[s] in [Monsanto’s] lobbying materials.” *Id.* at 50. When interpreting statutes like FIFRA, “[i]t is hardly this Court’s place to pick and choose among competing policy arguments . . . along the way to selecting whatever outcome seems to [the Court] most congenial, efficient, or fair.” *Pereida v. Wilkinson*, 592 U.S. 224, 241 (2021).

In any case, Monsanto and its amici do not speak for everyone in the agricultural system, and their policy arguments are seriously flawed. Amici here—organizations representing, serving, and comprised of farmers and farmworkers—can assure this Court that interpreting FIFRA to permit state law failure-to-warn claims like respondent’s will not “threaten both the food supply and the economic viability of American agriculture,” Pet. Br. 51; have “devastating” “impacts on agriculture and the food supply,” Nat’l Agric. Ass’ns Amici Br. 7; “imperil[] . . . America’s domestic food supply,” State Farm Bureaus Amici Br. 8; nor “have disastrous consequences for . . . farmers,” Nebraska et al. Amici Br. 6.

1. Holding Monsanto accountable for violating Missouri law will not threaten farmers’ ability to grow enough food. To start, requiring Monsanto to provide adequate warnings will not deprive farmers of glyphosate or any other pesticide.² But even if the question

² Glyphosate is an herbicide. FIFRA defines “pesticide” to include “any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest,” to include “any . . . weed,” 7 U.S.C. § 136(t)(1), (u)(1), and “any substance or mixture of substances intended for use as a plant regulator, defoliant, or desiccant,” 7 U.S.C. § 136(u)(2). Thus, herbicides like glyphosate are “pesticides” under FIFRA. Amici hereinafter

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in this case were whether Monsanto should be allowed to sell glyphosate, Monsanto and its amici overstate the pesticide's relative effectiveness and importance. They ignore that decades of glyphosate applications have resulted in glyphosate-resistant weeds taking hold across huge swathes of American farmland, significantly eroding glyphosate's efficacy. And they either overlook farmers' ability to control weeds by other methods or incorrectly claim glyphosate is necessary for those alternative methods to work.

2. In Monsanto's and its amici's telling, glyphosate has been such an economic boon for farmers that this Court should bend over backwards to protect it. But they disregard the harms that glyphosate inflicts on the people who grow our food. Monsanto and its supporters fail to mention the potential for glyphosate to damage or destroy neighboring farmers' non-glyphosate-tolerant crops, a phenomenon that can be especially disastrous for amici whose membership includes and represents organic farmers. They also omit any mention of glyphosate's devastating effects on pollinators and the resulting impacts on the long-term economic viability of farming. Further, Monsanto and its amici ignore the negative health effects glyphosate has on farmers, farmworkers, and their families, and the threat this poses to agriculture. Finally, although Monsanto and its amici frame themselves as guardians of farmers' interests, the reality is that Monsanto wields its economic and legal power to the detriment of farmers who wish to use

use the term "pesticide," consistent with FIFRA, to include herbicides.

glyphosate and glyphosate-tolerant seeds.

3. Monsanto's amici make one final argument requiring rebuttal: that glyphosate reduces greenhouse gas emissions, thus mitigating the climate crisis. Not only can farmers prevent those emissions without glyphosate, but the way glyphosate is used necessitates emissions-intensive production methods. This Court should not be left with the impression that glyphosate is an environmentally beneficial substance.

* * *

Should this Court choose to weigh the policy considerations Monsanto and its amici raise, those issues tilt in favor of affirming. Monsanto and its amici neither share the experiences nor represent the interests of the independent farmers and farmworkers who form the backbone of the agricultural system. Holding Monsanto accountable for its tortious wrongdoing poses no danger to amici or the farmers and farmworkers they serve. Indeed, it is corporate impunity which poses the larger threat to our food system. Amici therefore urge this Court to affirm.

ARGUMENT

I. Affirming Will Not Threaten the Global Food Supply

Monsanto's and its amici's primary policy argument is that affirming the decision below will threaten the United States's ability to produce enough food. *See, e.g.*, Pet. Br. 51 (arguing that regulating pesticides "could threaten . . . the food supply"); Nat'l Agric. Ass'ns Amici Br. 7 (warning of "devastating" effects on "the food supply"). But enforcing the

requirements of Missouri law and FIFRA, which both require pesticide labels to include warnings necessary to protect human health, will not result in food shortages.

A. Ruling Against Monsanto Will Not Deprive Farmers of Access to Glyphosate

To start, all Monsanto's and its amici's warnings of a food-supply calamity rest on the assertion that affirming will prevent farmers from accessing glyphosate. But banning glyphosate is not on the table here. Respondent does not claim Monsanto should not be able to sell glyphosate. He merely asserts that Monsanto should have provided adequate warnings to users of glyphosate's potential dangers—as both FIFRA and Missouri law require. *See* 7 U.S.C. § 136(q)(1)(G) (providing that a pesticide is “misbranded” under FIFRA if “the label does not contain a warning or caution statement which may be necessary and if complied with, together with any requirements imposed under section 136a(d) of this title, is adequate to protect health and the environment”).

Even if requiring Monsanto to comply with FIFRA and Missouri law would somehow prevent Monsanto from selling glyphosate in the United States, Monsanto's and its amici's panicky prognostications make little sense. On the one hand, they claim or imply that affirming will deprive American farmers of access to glyphosate. *See, e.g.*, Pet. Br. 53 (warning that “[t]he elimination of glyphosate-based herbicides from the market” as a result of affirming “would be devastating for the agricultural economy”); Nebraska et al. Amici Br. 14 (warning of “dire consequences for Amici States' agricultural industries and their farmers”). On the other hand, Monsanto's amici note that

farmers can, do, and will continue to obtain generic glyphosate from other producers located in countries like India. *See, e.g.*, Nat'l Agric. Ass'ns Amici Br. 6; Bean et al. Amici Br. 10; *see also* Ricardo Alcántara-de la Cruz et al., *Thirty Years of Glyphosate-Resistant Crops and Weeds: Current Situation and Future Prospects*, 2026 Pest Mgmt. Sci., at *2 (2026), <https://perma.cc/2QNP-FP3C> (“The expiration of Monsanto’s glyphosate patent in 2000 opened the global market to new manufacturers . . .”). At bottom, Monsanto’s and its amici’s objection is not that farmers will lose access to glyphosate. Instead, it is that farmers will obtain glyphosate from sources abroad—an ironic argument to be making on behalf of a company (Bayer) that is itself based overseas.³

B. Farmers Can Substitute Other Pesticides for Glyphosate

Monsanto and its amici also claim that glyphosate’s relative effectiveness and cost mean other pesticides are not replacements. *See, e.g.*, Pet. Br. 10–11 (touting glyphosate’s relative cost-effectiveness); Nat'l Agric. Ass'ns Amici Br. 9 (similar); Bean et al. Amici Br. 8 (similar). However, other pesticides priced similarly to glyphosate are statistically as effective in controlling common weeds. *See* Chandra L.-M. Montgomery et al., *Efficacy, Crop Response, and Economics of Alternatives to Glyphosate for Pre-Plant Weed Control in Small Grains*, 7 *Agrosys. Geoscis. & Env't*, at

³ To be sure, Monsanto’s amici speculate that Chinese supplies of glyphosate might be less reliable in the future, *see, e.g.*, Bean et al. Amici Br. 12–26, but even crediting those concerns, they provide no reason to think American farmers will lose access to glyphosate produced in friendly countries like India.

*8 (2024), <https://perma.cc/S76R-PF7Q> (finding various pesticide combinations “provided equivalent crop safety[and] weed control, and the cost of these treatments was similar to that of glyphosate when used as a pre-plant burndown treatment prior to [planting] barley or wheat”).

Moreover, while older alternatives to glyphosate exist, glyphosate’s overuse has limited the development of new pesticides. Monsanto and its amici claim that subjecting the company to consequences for its tortious behavior would endanger agricultural “innovation.” Pet. Br. 50; *see also* Nat’l Agric. Ass’ns Amici Br. 26 (arguing that “increased exposure to state tort litigation chills pesticide innovation, incentivizing manufacturers to reallocate [R&D] from high-agronomic-value, broad-spectrum chemistries to products with lower litigation risk”). But over the past three decades, the hegemonic position of glyphosate paired with Roundup-Ready seeds has driven pesticide manufacturers to deprioritize R&D into alternative pesticides. Ian Heap & Stephen O. Duke, *Overview of Glyphosate-Resistant Weeds Worldwide*, 74 *Pest Mgmt. Sci.* 1040, 1047 (2018), <https://perma.cc/UH4U-8JF3> (“The very success of glyphosate-resistant crops is, in part, responsible for the lack of incentive for the agricultural chemical industry to identify and develop new herbicide sites of action.”). For example, there were 40 percent fewer herbicide patents submitted in the 15 years following Monsanto’s introduction of the first glyphosate-tolerant crop in 1996 than in the 15 years preceding it. Ren-Yu Qu et al., *Where Are the New Herbicides?*, 77 *Pest Mgmt. Sci.* 2620, 2621 (2021), <https://perma.cc/4C82-BMHY>. Monsanto and its amici claim that protecting glyphosate is necessary to

support innovation and ensure farmers can access a variety of pesticides, but the opposite is true.

C. Monsanto and Its Amici Ignore Glyphosate's Plummeting Efficacy in the Face of Glyphosate-Resistant Weeds

Monsanto's and its amici's warnings of a shock to the food supply fail to acknowledge the biggest story in weed control over the past thirty years: Glyphosate's collapsing effectiveness in the face of an epidemic of glyphosate-resistant weeds. To hear Monsanto and its amici tell it, glyphosate is "more effective than anything else," Pet. Br. 10, "effective against a broad spectrum of weeds," Agric. Retailers Ass'n & Nat'l Agric. Aviation Ass'n Amici Br. 13, and "effective and efficient," State Farm Bureaus Amici Br. 3.

Maybe once upon a time. But Monsanto and its amici fail to recognize that glyphosate's heyday is past. Glyphosate is not only unnecessary to ensuring continued crop yields in the future; its declining efficacy means it cannot do so.

Glyphosate-resistant weeds have spread rapidly over the past three decades. Scientists first identified glyphosate weed resistance in rigid ryegrass (*lolium rigidum*) in an Australian apple orchard "in 1996 . . . coincidentally and ironically, the same year that the first [glyphosate-resistant] crop was introduced in the USA and that Monsanto published a paper suggesting that glyphosate resistance would not evolve." Alcántara-de la Cruz et al., *supra*, at *3. Since then, glyphosate's widespread use has "caused intense selection pressure . . . that facilitated the evolution of [glyphosate-resistant] weeds." Christopher Landau et al., *The Silver Bullet That Wasn't: Rapid Agronomic Weed*

Adaptations to Glyphosate in North America, 2 PNAS Nexus, at 2 (2023), <https://perma.cc/W8A7-ZZWL>; see also Adam S. Davis & George B. Frisvold, *Are Herbicides a Once in a Century Method of Weed Control?*, 77 Pest Mgmt. Sci. 2209, 2209 (2017), <https://perma.cc/D6QA-TLYB> (“The rapid and pervasive adoption of [glyphosate-tolerant] crops in the western hemisphere led to heavy reliance on glyphosate for weed control, a reduction in the diversity of weed control tactics, and a steady rise in glyphosate resistant weeds.”).

Glyphosate-resistant weeds are now ubiquitous in American farm fields. At least 17 weeds in the United States have evolved resistance to glyphosate. Heap & Duke, *supra*, 74 Pest Mgmt. Sci. at 1041–42. And although estimates vary, data indicate that glyphosate-resistant weeds can be found in most crop fields. Graham Brookes, *Genetically Modified (GM) Crop Use 1996–2020: Environmental Impacts Associated with Pesticide Use Change*, 13 GM Crops & Food 262, 274 (2022), <https://perma.cc/DT9D-2ZP9> (admitting in a Bayer-funded study that “[s]ome glyphosate-resistant [weed] species, such as marehail (*Conyza canadensis*), waterhemp (*Amaranthus tuberculatus*) and palmer pigweed (*Amaranthus palmeri*) in the USA, are now widespread, with the affected area being possibly within a range of 60–80% of the total combined area annually devoted to maize, cotton, and soybeans.”); Jackie Pucci, *The War Against Weeds Evolves in 2018*, CropLife (Mar. 20, 2018), <https://perma.cc/P5UZ-U94F> (reporting on survey of American farmers finding that “73% of nearly 4,000 growers . . . reported having glyphosate resistance on their farm in 2017. That figure represents 120 million acres . . .”).

Although Monsanto’s amici claim that “glyphosate has enabled growers to use fewer and less toxic herbicides,” Nat’l Agric. Ass’ns Amici Br. 12, glyphosate dependence puts farmers on a pesticide treadmill. Once glyphosate-resistant weeds emerge, many farmers turn to mixtures of glyphosate and older, highly toxic pesticides, like dicamba or 2,4-D (a component of Agent Orange), to control the new generation of superweeds. Indeed, roughly a decade ago, Monsanto rolled out a glyphosate-dicamba mix—alongside seeds bred to resist both chemicals—as a solution to the well-known problem of glyphosate-resistant weeds. H. Claire Brown, *Attack of the Superweeds*, N.Y. Times Mag. (June 15, 2023), <https://perma.cc/83LD-UGR7>. Glyphosate is not a true alternative to more dangerous chemicals, as Monsanto and its amici claim. To the contrary, glyphosate reliance makes it more likely that farmers will have to employ those other pesticides in the future.

In sum, the near-complete infestation of American cropland by glyphosate-resistant weeds means Monsanto’s purported wonder-product was really a “short-lived success.” Landau et al., *supra*, at *10. This Court should ignore Monsanto’s and its amici’s implications that protecting Monsanto from the consequences of its tortious behavior is the cost of ensuring farmers can control weeds and boost yields, because glyphosate itself can no longer reliably perform that task.

D. Farmers Can Control Weeds Without Pesticides

Fortunately, farmers battling glyphosate-resistant weeds or who choose not to use pesticides like glyphosate have other options. Monsanto and its amici frame the non-glyphosate choices available to

farmers as either more pesticides or conventional tilling. *See, e.g.*, Nat'l Agric. Ass'ns Amici Br. 15. Off the bat, as explained *supra*, glyphosate is not a genuine alternative to other pesticides like dicamba or 2,4-d, because glyphosate induces resistant weeds that lead farmers to use more and other pesticides. *See supra* at 13. In any case, Monsanto and its amici do not provide a complete picture of the weed-control options available to agricultural producers. Farmers—including many of those represented by amici and their members—can and do effectively employ weed control measures beyond the pesticides companies like Monsanto sell or the conventional tilling Monsanto and its amici decry.

For example, farmers can reduce weed pressure by diversifying away from planting just one or two glyphosate-tolerant crops year after year. Research consistently confirms the effectiveness of crop diversification as a non-chemical method of weed management. *See, e.g.*, Nian-Feng Wan et al., *Global Evidence that Plant Diversity Suppresses Pests and Promotes Plant Performance and Crop Production*, 10 *Nature Ecol. & Evolution* 293 (2026), <https://perma.cc/63M8-5BR5>; D. Scott & R.P. Freckleton, *Crop Diversification and Parasitic Weed Abundance: A Global Meta-Analysis*, 12 *Nature Sci. Reps.* (2022), <https://perma.cc/X2ZM-JGPP>; Gourav Sharma et al., *Crop Diversification for Improved Weed Management: A Review*, 11 *Agric.* No. 461 (2021), <https://perma.cc/8C57-2DTF>.

In fact, now that glyphosate overuse has engendered widespread resistance among weeds, *see supra* at 11–13, crop diversification is among the most effective tools farmers have for suppressing the new

generation of glyphosate-resistant superweeds. Sharma et al., *supra*, at *8 (summarizing studies finding crop diversification suppresses glyphosate-resistant weeds).

But because glyphosate can kill or damage crops that have not been genetically engineered to tolerate the pesticide, glyphosate-dependent cropping systems make it difficult for farmers to diversify and incentivize farmers to adopt monocropping systems. Sheldon Krinsky, *Can Glyphosate-Based Herbicides Contribute to Sustainable Agriculture?*, 13 *Sustainability*, at *2 (2021), <https://perma.cc/6AJ9-DZTN> (“[G]lyphosate is used functionally with [genetically engineered Roundup-ready seeds] to maintain a monocultural crop system”); *see also* David A. Mortensen & Richard G. Smith, *Confronting Barriers to Cropping System Diversification*, 4 *Frontiers in Sustainable Food Sys.*, at *4 (2020), <https://perma.cc/YB4L-ER2B> (noting that “farmers have often responded to” Monsanto’s package of glyphosate and glyphosate-tolerant seeds “by exclusively planting [glyphosate-tolerant] cultivars and applying glyphosate herbicide in the same fields, year after year”). Glyphosate thus increases barriers to the adoption of a tried-and-tested non-chemical method of weed control.

In addition to crop diversification, cover cropping—growing crops in between the harvesting of one crop and the planting of another—can further suppress weeds. Cover crops are not harvested and sold, but instead are left in the field, where they suppress weeds by “compet[ing] with [them] for space, water, nutrients, and light,” and by reducing the sunlight available to weeds and the temperature of the soil. Gustavo Camargo Silva & Muthukumar

Bagavathiannan, *Mechanisms of Weed Suppression by Cereal Rye Cover Crop: A Review*, 115 *Agronomy J.* 1571, 1572 (2023), <https://perma.cc/C6X2-7ZDE>. Indeed, using cover crops in combination with other non-pesticide weed management techniques can suppress up to 100 percent of weeds. See Matthew R. Ryan et al., *Potential Synergistic Effects of Cereal Rye Biomass and Soybean Density on Weed Suppression*, 59 *Weed Sci.* 238 (2011), <https://perma.cc/99VF-M334>.

Some of Monsanto’s amici posit that glyphosate “enabl[es] farmers to . . . plant cover crops.” Nat’l Agric. Ass’n’s Amici Br. 9. To be sure, some farmers use glyphosate in cover-cropping. But glyphosate is not necessary for farmers who want to use cover crops to suppress weeds. Many organic farmers (who cannot use synthetic pesticides like glyphosate, *see infra* at 20) employ cover-cropping by mowing or roller-crimping⁴ the cover crop, or by allowing heat or frost to kill the cover crop prior to planting. See, e.g., Robert Willmott et al., *Potential of Cover Crop Use and Termination with a Roller-Crimper in a Strip-Till Silage Maize (Zea mays L.) Production System in the Central Valley of California*, 15 *Agronomy*, at *2 (2025), <https://perma.cc/HMK5-WGUT>; Laura Vincent-Caboud et al., *Overview of Organic Cover Crop-Based No-Tillage Technique in Europe: Farmers’ Practices*

⁴ “A roller crimper is a drum or cylinder, often with blunt curved blades, that is rolled over cover crops to injure crop stems, stop further growth and produce a thick, weed-suppressing mat of cover crop biomass.” Annie Edwards & Margaret Smither-Kopperl, *Termination Timing for Cover Crops Using a Roller Crimper in California’s Central Valley – One Year Demonstration Results*, U.S. Dep’t of Agric. 2 (Mar. 2024), <https://perma.cc/8P8S-YM23>.

and Research Challenges, 7 Agric., at *2 (2017), <https://perma.cc/KL88-W8D6>. The success of these methods belies Monsanto’s amici’s claim that glyphosate is a necessary component of more environmentally responsible weed control.

Largely ignoring non-pesticide methods of weed control or incorrectly claiming that glyphosate is necessary to the success of such measures, Monsanto’s amici assert that the only real alternative to pesticides like glyphosate is conventional tilling, which they note can damage soil and have negative environmental effects. Nat’l Agric. Ass’ns Amici Br. 9–10, 19.

Amici here agree that conventional tilling can have negative environmental consequences. So it is more than a little ironic for Monsanto’s amici to impugn conventional tilling here, as Monsanto’s Technology Use Guide *recommends* such tilling to reduce the chance of inducing pesticide-resistant weeds. *See, e.g.*, Bayer, *Technology Use Guide*, at 34 (2025), <https://perma.cc/LR35-74YP> (“Agreement”) (“Recommendations: Start clean with a burndown herbicide or tillage.” (cleaned up)). And in any case, conventional tilling is not necessary to the non-pesticidal methods of weed control like cover-cropping discussed *supra*. *See, e.g.*, Madhav Dhakal et al., *Cover Crop Management Strategies Affect Weeds and Profitability of Organic No-Till Soybean*, 39 Renewable Agric. & Food Sys., at *11 (2024), <https://perma.cc/3N7Y-DN6E> (demonstrating not only possibility of no-till, non-pesticide cover-cropping, but also finding that “[t]he elimination of tillage in the no-till termination treatments maximized economic returns”).

In short, farmers are not—as Monsanto and its amici imagine—constrained to choose between

pesticides like glyphosate or conventional tilling. Many farmers, including many of amici’s members, successfully employ other methods of weed control to maintain crop yields and ensure the long-term viability of agriculture

II. Glyphosate Reliance Endangers the Long-Term Viability of American Agriculture

Monsanto and its amici claim glyphosate “empower[s] American farmers” and is essential to “the economic viability of American agriculture.” Pet. Br. 2, 51; *see also, e.g.*, Nat’l Agric. Ass’ns Amici Br. 6; State Farm Bureaus Amici Br. 5. But in fact, glyphosate—and the shield of preemption Monsanto seeks to erect around it—endangers the future of American farmers and farmworkers.

A. Glyphosate Can Drift, Damaging Other Farmers’ Crops

When Monsanto and its amici claim glyphosate benefits farmers, they ignore those farmers’ neighbors. The dominant method of glyphosate application is by spraying, which can result in the chemical drifting away from the intended target area and damaging neighboring farmers’ non-Roundup resistant crops. *See, e.g.*, Wei Ding et al., *Biological Response of Soybean and Cotton to Aerial Glyphosate Drift*, 25 J. Crop Improvement 291 (2011), <https://perma.cc/WF2X-US6W> (documenting experiment in which aerial application of glyphosate damaged nearby non-glyphosate-resistant crops). In addition to aerial drift, “waterway contamination is a[nother] source of glyphosate transfer to adjacent agricultural fields.” Marcelo P. Gomes et al., *Alteration of Plant Physiology by Glyphosate and Its By-product*

Aminomethylphosphonic Acid: An Overview, 65 *J. Experimental Botany* 4691, 4691–92 (2014), <https://perma.cc/9EEJ-TPB9>.

Glyphosate contamination significantly decreases yields of non-tolerant crops. For example, because there is no Roundup-Ready rice, exposure to even “[s]ub-lethal rates of glyphosate can cause severe injury to rice and significantly reduce grain yield.” Clifford Koger et al., *Rice (Oryza sativa) Response to Drift Rates of Glyphosate*, 61 *Pest Mgmt. Sci.* 1161, 1161 (2005), <https://perma.cc/YK65-2J8V>. Likewise, even at non-lethal doses, glyphosate drift can cause distortions in tomatoes and other fruit which render them unmarketable. Ramdas Kanissery et al., *Glyphosate: Its Environmental Persistence and Impact on Crop Health and Nutrition*, 8 *Plants* 499, at *5 (2019), <https://perma.cc/YCX6-4UQC>.

Monsanto and its amici also studiously omit any mention of organic farmers, like those represented by many of amici and their members, who choose a way of farming which legally forbids them from employing synthetic pesticides like glyphosate. Even as overall farmland shrinks, organic farming is expanding as consumers demand food produced without industrial methods and producers see the financial benefits of serving this growing market. *Compare* U.S. Dep’t of Agric., 2022 Census of Agriculture 353 (2024), <https://perma.cc/ASX5-9Q93> (documenting decline of approximately 19 million acres of cropland from 2017 to 2022), *with* Sharon Raszap Skorbiansky et al., *Rising Consumer Demand Reshapes Landscape for U.S. Organic Farmers*, U.S. Dep’t of Agric. (Nov. 14, 2023), <https://perma.cc/ZPY7-WUT2> (“Certified organic U.S. land for growing crops or livestock increased from 1.8

million in 2000 to 4.9 million in 2021.”). Indeed, organic crops are often significantly more profitable than their conventionally grown counterparts, including for commodity crops like corn and soybeans typically grown with glyphosate. *See* Michael Lange-meier, *Conventional and Organic Enterprise Net Returns*, at 3, Dep’t of Agric. & Consumer Econ., Univ. of Ill. Urbana-Champaign (July 3, 2024), <https://perma.cc/2FU4-C3WN> (finding organic corn produces \$359 more net revenue per acre, and organic soybeans \$296 more net revenue per acre, than their conventional counterparts).

Glyphosate contamination of neighboring land is especially destructive to organic farmers. Under federal law, organic farmers cannot use Roundup-Ready seeds, *see* 7 C.F.R. § 205.2 (defining “excluded methods” to include “methods used to genetically modify organisms”), so their plants are by law genetically defenseless to glyphosate. Thus, an errant exposure from a neighboring farm can spell disaster for an organic farmer’s crop.

Glyphosate contamination can also devastate an organic farmer’s subsequent years, because federal regulations require land to be free of synthetic substances like glyphosate for three years prior to being certified organic. *See* 7 C.F.R. § 205.202(b). An incident of glyphosate contamination from a neighboring field can restart that clock, forcing farmers to wait years more to realize their investments in organic farming. *See, e.g., Johnson v. Paynesville Farmers Union Coop. Oil Co.*, 817 N.W.2d 693, 697–98 (Minn. 2012) (describing case in which pesticide drift forced plaintiffs to take crops out of organic production for three years). Overreliance on glyphosate thus

constrains a rapidly growing sector of the American agricultural economy.

Moreover, as noted *supra* at 13, many farmers have responded to the emergence of glyphosate-resistant weeds by switching to cocktails of glyphosate mixed with older pesticides like dicamba and 2,4-d. These additional pesticides in glyphosate-plus combinations are notorious for drift, even more so than glyphosate. *See, e.g.*, Thomas C. Mueller & Lawrence E. Steckel, *Dicamba Volatility in Humidomes as Affected by Temperature and Herbicide Treatment*, 33 *Weed Tech.* 541, 545 (2019), <https://perma.cc/6GDG-PGLS> (combining dicamba and glyphosate increased detectable dicamba air concentrations by factor of 2.9 to 9.3); Eric Lipton, *Crops in 25 States Damaged by Unintended Drift of Weed Killer*, *N.Y. Times* (Nov. 1, 2017), <https://perma.cc/9MKT-ZXT3> (noting dicamba drift damaged “about 4 percent of all soybeans planted in the United States” in 2017); Walt Davis, *Herbicide Drift Damage Not A New Issue For Cotton Growers*, *Farm Progress* (Aug. 1, 2017), <https://perma.cc/8RTJ-STQK> (describing impact of 2,4-d drift on cotton growers). The risk of drifting pesticides used on glyphosate-resistant weeds compounds the danger presented by glyphosate alone.

B. Glyphosate Harms Pollinators

Monsanto and its amici claim glyphosate boosts yields with negligible environmental impacts. *E.g.*, *Pet. Br. 11* (claiming glyphosate “breaks down quickly in the environment”); *Nat’l Agric. Ass’ns Amici Br. 8, 9–13* (similar); *State Farm Bureaus Amici Br. 8* (similar). But that view ignores the harms glyphosate inflicts on a critical component of the farm economy and the ecological systems on which it depends:

pollinators. By reducing the number of pollinators, glyphosate threatens long-term crop yields and amici's members' livelihoods.

“Pollination by insects is . . . necessary for production of most crops, including those providing essential micronutrients, and is thus essential for food security.” J.R. Reilly et al., *Crop Production in the USA Is Frequently Limited by a Lack of Pollinators*, 2020 Proc. Royal Soc’y B 287, at *1–2 (2020), <https://perma.cc/2HEQ-ESLC>. Given the indispensable role pollinators play in agriculture, inadequate pollination poses well-understood dangers to food security and agricultural producers' livelihoods. *E.g.*, Katherine J. Turo et al., *Insufficient Pollinator Visitation Often Limits Yield in Crop Systems Worldwide*, 8 Nature Ecol. & Evolution 1612, at *4 (2024), <https://perma.cc/E6XE-MDKK> (finding that between 28–61 percent of crop systems are yield-limited due to lack of pollinators). Endangering pollinators is not an abstract environmental concern for amici and their members; it is an immediate economic threat to the viability of American farming.

Glyphosate is one such threat to pollinators. To start, glyphosate exposure can be lethal to critical pollinators like bees. *See* Lucas Battisti et al., *Is Glyphosate Toxic to Bees? A Meta-Analytical Review*, 767 Sci. Total Env't, at *4 (2021), <https://perma.cc/BUU4-SRWR> (meta-analysis of existing research finding glyphosate kills bees). Further, glyphosate's effectiveness at obliterating non-Roundup-ready plants means that its application can reduce pollinators' food supply by killing non-target flowering plants. David J. Carpenter et al., *Effects of Herbicide on Flowering*, 39 Env't Toxicology & Chem. 1244, 1250–52 (2020),

<https://perma.cc/6G65-N72N>.

Even at sublethal doses, glyphosate reduces the flowering of plants, making it harder for pollinators to find the food they need to survive. *Id.* (documenting suppressed flowering from glyphosate exposure at 5% of label concentration); B. Strandberg et al., *Effects of Glyphosate Spray-Drift on Plant Flowering*, 280 *Env't Pollution*, at *9–10 (2021), <https://perma.cc/9SES-Z6NU>; Y.L. Dupont et al., *Effects of Herbicide and Nitrogen Fertilizer on Non-Target Plant Reproduction and Indirect Effects on Pollination in Tanacetum Vulgare (Asteraceae)*, 262 *Agric., Ecosys. & Env't* 76 (2018), <https://perma.cc/ML2V-7EYN>. And although glyphosate may break down in the environment more quickly than some longer-lived pesticides, *Pet. Br.* 11, the damaging effects of glyphosate exposure to flowering plants on which pollinators rely can last for years after glyphosate application. Alexandra R. Golt & Lisa J. Wood, *Glyphosate-Based Herbicides Alter the Reproductive Morphology of Rosa Acicularis (Prickly Rose)*, 12 *Frontiers Plant Sci.*, at *8–10 (2021), <https://perma.cc/X5Y5-MDQB> (finding glyphosate exposure deformed flowers and reduced pollen viability in non-target flowering plants one year after glyphosate application, and finding glyphosate residues in flowers two years after application).

In addition, sublethal glyphosate exposure also impairs pollinators' biological functioning. *See, e.g.*, Kimmo Kaakinen et al., *Bumblebees (Bombus Terrestris) Forage on Plants Treated with Glyphosate-Based Herbicides Despite Potential Behavioral Consequences*, 286 *Env't Rsch.* (2025), <https://perma.cc/F8Z9-RK92>; Anja Weidenmüller et al., *Glyphosate Impairs Collective Thermoregulation*

in *Bumblebees*, 376 *Sci.* 6597 (2022), <https://perma.cc/6354-HT2P> (finding glyphosate exposure impairs bumblebees' ability to maintain hive temperatures necessary for colony expansion and reproduction); Qi-Hua Luo et al., *Effects of a Commercially Formulated Glyphosate Solutions at Recommended Concentrations on Honeybee (Apis Mellifera L.) Behaviors*, 11 *Nature Sci. Reps.* (2021), <https://perma.cc/ACL2-AG2Y> (finding glyphosate harms various cognitive and physical capabilities of honeybees); Erick V.S. Motta, Kasie Raymann & Nancy A. Moran, *Glyphosate Perturbs the Gut Microbiota of Honey Bees*, 115 *Proc. Nat'l Acad. Sci.* 10305 (2018), <https://perma.cc/A37Y-JMVH> (finding glyphosate disrupts enzymes in honeybees' digestive systems, increasing susceptibility to infection).

In short, glyphosate reliance starves and sickens pollinators. Without pollinators, the farmers whom Monsanto claims to serve and for whom its amici claim to speak cannot maintain crop yields. Thus, it is Monsanto's products that "threaten both the food supply and the economic viability of American agriculture." *Pet. Br.* 51.

C. Glyphosate Endangers Farmers and Farmworkers

Monsanto and its amici claim that glyphosate is a boon to agricultural laborers because it frees them from labor-intensive manual weeding. *Pet. for Cert.* 13; *State Farm Bureaus Amici Br.* 7. To the contrary, overreliance on glyphosate threatens the workers who make American agriculture possible.

The prevalence of glyphosate in agriculture means farmers and farmworkers are frequently exposed to

the chemical. One recent study documented glyphosate in the urine of 82 percent of surveyed farmworkers and a metabolite of glyphosate (AMPA) in the urine of 87 percent. See Carly Hyland et al., *Mixed-Methods Assessment of Farmworkers' Perceptions of Workplace Compliance with Worker Protection Standards and Implications for Risk Perceptions and Protective Behaviors*, 29 J. Agromed. 355, 360–61 (2024), <https://perma.cc/J7XN-UXN5>.

Research links glyphosate exposure to negative health effects for farmers, farmworkers, and their families. For instance, one paper associates rheumatoid arthritis in pesticide applicators' spouses with glyphosate exposure. Christine G. Parks et al., *Rheumatoid Arthritis in Agricultural Health Study Spouses: Associations with Pesticides and Other Farm Exposures*, 124 Env't Health Perspectives 1728 (2016), <https://perma.cc/M6EY-6MX8>. Another recent study finds that farmers exposed to high levels of glyphosate are 71 percent more likely to report cognitive issues than farmers who are not so exposed. Yaqun Yuan et al., *High Pesticide Exposure Events and Subjective Cognitive Complaints Among US Farmers*, 293 Env't Rsch., at *5 (2026), <https://perma.cc/N6LZ-G9BE>. And while the jury in this case concluded glyphosate causes cancer in users of consumer Roundup products, there is also evidence that agricultural pesticide applicators' exposure to glyphosate is associated with biological markers linked to cancer. Vicky C. Chang et al., *Glyphosate Exposure and Urinary Oxidative Stress Biomarkers in the Agricultural Health Study*, 115 J. Nat'l Cancer Inst. 394 (2023), <https://perma.cc/S9D2-K59Y>.

These risks follow farmers and farmworkers

home. One recent study of farmworkers in California explained that although “farmworkers are advised to remove work clothing and bathe immediately after returning home from work, . . . participants shared that it is hard to resist immediately hugging their children when they get home.” Ellena Soule-Siler et al., *Pesticide Biomonitoring Report-Back Preferences of Pregnant Agricultural Workers in California: Findings from Focus Groups*, 4 *Env’t Rsch.: Health*, at *6 (2026), <https://perma.cc/WM77-VXXN>. A farmworker participant explained: “As a mother, the first thing you want to do is to pick up the children, and you don’t have a chance to change, and then go get your children, and even if you don’t want to, you [expose] the children.” *Id.* (alteration in original).

Predictably given this para-occupational exposure, glyphosate and other pesticides are frequently present in farmers’ and farmworkers’ homes, where they and their families generally do not wear PPE. See Brian D. Curwin et al., *Pesticide Dose Estimates for Children of Iowa Farmers and Non-Farmers*, 105 *Env’t Rsch.* 307 (2007), <https://perma.cc/8HF7-6E3C>; Irene Navarro et al., *Occurrence of Pesticide Residues in Indoor Dust of Farmworker Households Across Europe and Argentina*, 905 *Sci. Total Env’t*, at *6 (2023), <https://perma.cc/94U3-UJH8> (finding glyphosate more commonly than other pesticides in farmworker housing).

Even beyond occupational and para-occupational exposure, farmers and farmworkers usually live in rural areas where glyphosate is prevalent in the environment. Research has found that simply being near farms spraying glyphosate is associated with significantly higher levels of the chemical in the body.

Cynthia L. Curl et al., *The Effect of Pesticide Spray Season and Residential Proximity to Agriculture on Glyphosate Exposure Among Pregnant People in Southern Idaho, 2021*, 131 *Env't Health Perspectives* (2023), <https://perma.cc/QNF5-4FBY>. And a recent study found that pregnant women living in rural counties with higher levels of glyphosate exposure—typical of areas where farmers and farmworkers generally reside—experienced lower birthweights and reduced gestation time. Emmett Reynier & Edward Rubin, *Glyphosate Exposure and GM Seed Rollout Unequally Reduced Perinatal Health*, 121 *Proc. Nat'l Acad. Scis.*, at *6 (2025), <https://perma.cc/GX6R-JNB9>.

Glyphosate reliance also increases the risks farmers and farmworkers face from other pesticides. As discussed *supra* at 13, glyphosate-resistant weeds have led farmers to turn to ever more dangerous combinations of pesticides. For instance, one farmworker told amicus Centro de los Derechos del Migrante that over time, weeds on the farm where they worked became resistant to glyphosate. As he explained: “This forced us to mix more toxic herbicides, like trifluralin and paraquat, in an attempt to control” the weeds.

Pesticides used to address glyphosate-resistant weeds, like trifluralin, paraquat, and dicamba, carry their own serious health risks for farmers and farmworkers. *See, e.g.*, Kimberly C. Paul et al., *Agricultural Paraquat Dichloride Use and Parkinson's Disease in California's Central Valley*, 53 *Int'l J. Epidemiology*, at *4–5 (2024), <https://perma.cc/HH53-9BTX> (finding workplace paraquat exposure more than doubles risk of Parkinson's disease); Eun Shil Cha et al., *Paraquat Application and Respiratory Health Effects*

Among South Korean Farmers, 69 *Occupational Env't Med.* 398 (2012), <https://perma.cc/4TGG-5SRK> (linking paraquat exposure to respiratory health effects in farmers); Jane A. Hoppin et al., *Chemical Predictors of Wheeze Among Farmer Pesticide Applicators in the Agricultural Health Study*, 165 *Am. J. Respiratory Critical Care Med.* 683, 685 (2002), <https://perma.cc/LB66-YW84> (linking exposure to trifluralin, paraquat, and other pesticides to respiratory issues in agricultural workers); Catherine C. Lerro et al., *Dicamba Use and Cancer Incidence in the Agricultural Health Study: An Updated Analysis*, 49 *Int'l J. of Epidemiology* 1326 (2020), <https://perma.cc/MEQ3-5BFL> (linking dicamba exposure in agricultural workers to several kinds of cancer). Thus, although Monsanto paints glyphosate as a labor-saving device, Pet. for Cert. 13, in the long term, its use requires laborers to expose themselves to increasingly toxic pesticide cocktails.

Given the elevated risks farmers, farmworkers, and their families face from pesticide exposure, accurate pesticide labels are crucial to protect the agricultural labor force. This is especially true given widespread but incorrect beliefs that otherwise increase workers' risks. See, e.g., Carly Hyland et al., *Examination of Urinary Pesticide Concentrations, Protective Behaviors, and Risk Perceptions Among Latino and Latina Farmworkers in Southwestern Idaho*, 255 *Int'l J. Hygiene & Env't Health*, at 5–6 (2024), <https://perma.cc/53AG-GNE9> (finding half of surveyed farmworkers believed that “pesticides are only dangerous if you can see or smell them” while “over a third of men [surveyed] indicated that the reason they do not wear PPE more often is because it is not important”). Accurate labels are thus an important way

farmers and farmworkers receive the information they need to keep themselves safe while applying chemicals like glyphosate.

If companies like Monsanto cannot be held accountable for failing to provide adequate health warnings on pesticide labels, then it is farmers and farmworkers who will suffer the consequences. That, in turn, threatens the viability of farming. Access to adequate labor is already one of the largest challenges facing farmers; endangering the health of existing farmworkers only exacerbates that problem. In the long term, precluding recovery against pesticide companies for endangering the health and safety of people who use its products will shrink the pool of those willing and able to grow the food on which we depend.

D. Monsanto Exploits Farmers

Monsanto and its amici frame Monsanto's interests as aligning with those of farmers, suggesting that what is good for Monsanto is good for agriculture. *See, e.g.*, Pet. Br. 53; Nat'l Agric. Ass'ns Amici Br. 7. But experience suggests otherwise. Indeed, Monsanto has a long history of enriching itself at farmers' expense.

Monsanto's amici tout the combination of glyphosate with the company's Roundup-Ready seeds. Nat'l Agric. Ass'ns Amici Br. 5–6. But except for an oblique reference to “seed purchasing contracts,” *id.* at 15, they omit any discussion of the contractual scaffolding which controls farmers' access to such seeds. To purchase glyphosate-tolerant seeds, farmers must sign Monsanto's “Technology Stewardship Agreement” which stipulates that farmers can only use its genetically modified seeds for a single crop. Bayer, *supra*, Agreement at 35, § 1.d. Farmers may not transfer

the seed to any other person, nor “save or clean any crop produced from [glyphosate-tolerant] Seed for planting.” *Id.* § 1.e–f. The transition to seeds genetically engineered to resist glyphosate has thus upended the centuries-old practices of farmers saving a portion of their crop as seeds for the following season or obtaining seeds from a neighboring farmer or community-based seed farmer. The adhesive nature of Monsanto’s seed contracts helps explain why “[f]or crops planted predominately with [genetically modified] seed (corn, soybeans, and cotton) seed prices rose by an average of 463 percent” from 1990 to 2020, compared with a 270 percent increase in seed prices overall. James M. MacDonald et al., *Concentration and Competition in U.S. Agribusiness*, USDA Econ. Rsch. Serv. 15 (June 2023), <https://perma.cc/Y7AV-VTVX>. For farmers facing razor-thin margins, these increased input costs can be devastating.

In addition, saving seeds from year to year allows farmers to improve their seeds’ adaptation to local conditions, which makes crops more resilient to local stressors—including weed pressure. Thus, contractually prohibiting seed saving can lower yields and increases reliance on large corporations like Monsanto.

On the back end, the Agreement restricts the markets available to farmers. Farmers are not permitted to sell seeds to neighboring farms, Bayer, *supra*, Agreement § 1.f, or research institutions, *id.* § 1.h. Thus, Monsanto reduces farmers’ economic independence on both the supply side (by requiring farmers to buy new seeds from Monsanto every season) and the demand side (by limiting the markets available to farmers).

Should any farmer have the temerity to challenge

Monsanto's position atop the commanding heights of the agricultural economy, the company has demonstrated its willingness to use the legal system to make an example of them. *See Monsanto Co. v. McFarling*, 488 F.3d 973, 975 (Fed. Cir. 2007) (affirming \$375,000 damages award against a farmer for saving seeds to plant in successive years); Paul Harris, *Monsanto Sued Small Farmers to Protect Seed Patents – Report*, Guardian (Feb. 12, 2013), <https://perma.cc/4LQS-FJXX> (citing 142 Monsanto patent infringement cases against small farmers, totaling over \$23 million in damages).

This Court should not be swayed by Monsanto's and its industry backers' claims to be looking out for the interests of farmers. Everyday farmers like those represented by amici and their members know Monsanto's modus operandi is to use its economic dominance to extract whatever it can from independent producers and to use the legal system to avoid consequences for its own wrongdoing. This case is part and parcel of that philosophy.

III. Glyphosate Is Not a Climate Solution

Finally, amici cannot allow to go unchallenged a remarkable claim by Monsanto's amici: that in addition to protecting the food supply, glyphosate fights climate change. Nat'l Agric. Ass'ns Amici Br. 5, 13; State Farm Bureaus Amici Br. 7. Not so.

To start, all of Monsanto's amici's claimed climate benefits flow from the assumption that glyphosate enables conservation tillage. State Farm Bureaus Amici Br. 7–8; Nat'l Agric. Ass'ns Amici Br. 5, 13. Amici here agree wholeheartedly on the importance of conservation tillage—including its climate benefits—but take exception to the idea that glyphosate is indispensable

to a no- or low-till farming system. As described *supra* at 13–18, it is entirely possible to farm using neither glyphosate nor conventional tilling. Thus, Monsanto’s amici’s claimed emissions benefits are illusory.

On the other side of the scale, glyphosate requires the use of emissions-intensive production methods. For example, as described *supra* at 15, glyphosate pushes farmers into monocropping the same one or two crops year after year. Over time, monocropping reduces the soil nutrients available to plants, thus requiring the use of synthetic fertilizers just to maintain productivity. Laura E. Balis et al., *Midwestern Specialty Crop Impacts on the Environment and Health: A Scoping Review*, 13 Agric. & Food Sec., at *2 (2024), <https://perma.cc/R74F-5HSA>. Production of synthetic fertilizers, in turn, is an incredibly energy-intensive process which contributes substantial amounts of greenhouse gases to the atmosphere. See Stefano Menegat, Alica Ledo & Reyes Tirado, *Greenhouse Gas Emissions from Global Production and Use of Nitrogen Synthetic Fertilisers in Agriculture*, 12 Nature Sci. Reps., at *3 (2022), <https://perma.cc/SMX7-VNML>. Moreover, not all nitrogen in synthetic fertilizer is used by plants; some of it enters the atmosphere as N₂O, *id.*, a gas which has a global warming potential “273 times that of CO₂ for a 100-year timescale,” see Env’t Protection Agency, *Understanding Global Warming Potentials* (Dec. 29, 2025), <https://perma.cc/8FFR-TXHW>. Monsanto’s amici’s climate arguments rely on overstating glyphosate’s emissions-reduction benefits and understating its harms.

Additionally, glyphosate reliance increases farmers’ exposure to climate change. Different crops

respond differently to the kinds of extreme weather which climate change can generate. Therefore, when glyphosate pushes farmers toward monocropping, they become more likely to experience catastrophic crop failure from drought, too much rain, heat waves, and other climate-related stressors. See Timothy M. Bowles et al., *Long-Term Evidence Shows that Crop-Rotation Diversification Increases Agricultural Resilience to Adverse Growing Conditions in North America*, 2 One Earth 284, 285 (2020), <https://perma.cc/CEJ4-ZR6E> (“Specialization in maize and soybean production, together with sensitivity of rain-fed crop production to climatic factors, makes regions such as the central [United States] increasingly sensitive to extreme weather events such as drought.”). In short, not only is Monsanto’s marquee herbicide far from a climate solution; it exacerbates the economic dangers the climate crisis poses for farmers.

CONCLUSION

For the aforementioned reasons and those given in Respondent’s brief, amici support Respondent’s request for affirmance.

Respectfully submitted,

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