DRIFTING TOWARDS SOLUTIONS: EXAMINING DICAMBA'S VOLATILITY ISSUES IN MODERN AGRICULTURE

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ABSTRACT

For several decades, Roundup Ready crops provided an incredible benefit to farmers by allowing glyphosate applications while crops were growing in the field. Over the years, repeated applications of glyphosate led to the rise of glyphosate-resistant weeds, which resulted in demand for a new herbicide-tolerant crop system. In response, the dicamba-tolerant crop system was created to eliminate the threat of glyphosate-resistant weeds without sacrificing the productivity offered by herbicide-tolerant crop systems. Unfortunately, post-emergent versions of dicamba never fully resolved the herbicide's volatility issues and dicamba drift has become a major issue for farmers across the country, damaging millions of acres and resulting in hundreds of millions of dollars in legal judgments against pesticide companies. The widespread damage from dicamba drift illustrated issues within agriculture that had long been known but had never been exacerbated on such a large scale.

In this Article, modern crop production is described in order to illustrate domestic agriculture's reliance on genetically modified crops and how, if a widely adopted crop system such as dicamba-tolerant crops proves to be problematic, other crop production methods will suffer immensely. Following this framework of crop farming, the history of the invention, commercialization, adoption, and repeated re-registrations of dicamba-tolerant crop systems is explained with an emphasis on government responses and their effects on drift damage levels across the nation. With this history provided, the struggles of farmers who have suffered crop damage from pesticide drift—only to be hampered by long and frustrating court processes for recovery—are outlined in order to understand the importance of resolving these issues. Once their frustrations are made clear, policy proposals from varying perspectives are analyzed with respect to Congress' intent under FIFRA in order to consider common ideas advanced against difficult issues. After the proposals are discussed, recommendations are set forth based on the proposals and the analysis thereof. Finally, the Article provides guidance on how anyone discussing this issue—from the eighth-generation row crop farmer to the staunchest environmental advocate, and from the pesticide company executive to

the plaintiffs' attorney representing a drift-damaged orchard—should view potential solutions.

I. INTRODUCTION

A. The Farm and the Furious

In October of 2016, Mike Wallace parked his pickup truck on a backroad not far from his Arkansas farm.[1] At that point in the season, most farms in the area had finished harvesting, leaving large expanses of barren land in the region.[2] Wallace had harvested his 5,000-acre farm with suspiciously low yields.[3] At least 40% of Wallace's soybean crop had been damaged, as evidenced by the cupped leaves on Wallace's soybean plants.[4]

Wallace had seen his soybeans exhibit this issue in the prior season and knew the underlying problem.[5] The Arkansas farmer voiced his frustrations to anyone who would listen.[6] Wallace filed complaints with the Arkansas State Plant Board and advised other farmers to do the same.[7] The Wall Street Journal even cited Wallace's struggles in an article on the issue.[8]

Despite this effort, Wallace watched helplessly as a herbicide called dicamba drifted from a neighboring farm onto his fields for the second consecutive season.[9] The dicamba drift cost Wallace hundreds of thousands of dollars due to decreased crop yield.[10] With all options exhausted, Wallace decided to meet Curtis Jones, the farmhand who applied the herbicide at the neighboring farm.[11] The meeting went

1. Boyce Upholt, *A Killing Season*, THE NEW REPUBLIC (Dec. 10, 2018), https://newrepublic.com/article/152304/murder-monsanto-chemical-herbicide-arkansas [https://perma.cc/5GE4-8V6Y].

2. *Id.*

3. *Id.*

4. David Koon, *Farmer vs. Farmer*, ARK. TIMES (Aug. 10, 2017, 3:00 PM), https://arktimes.com/news/cover-stories/2017/08/10/farmer-vs-farmer?oid=8526754 [https://perma.cc/C2PD-TNNX].

5. Upholt, *supra* note 1.

6. Koon, *supra* note 4.

7. *Id.*

8. Jacob Bunge, *Farmer's Illegal Use of Herbicide Takes Toll on Neighboring Crops*, WALL ST. J. (Aug. 2, 2016, 5:30 AM), https://www.wsj.com/articles/farmers-illegal-use-of-herbicide-takes-toll-on-neighboring-crops-1470130201.

9. Upholt, *supra* note 1.

10. *Id.*

11. *Id.*

south quickly.[12] Less than two minutes after Jones arrived, Wallace lay dying in the dirt from multiple gunshot wounds.[13] Curtis Jones was sentenced to 24 years in prison for second-degree murder in the shooting death of Mike Wallace.[14]

B. The Bigger Picture of Dicamba Drift

While Wallace's death is unspeakably tragic, the experience of losing crops due to dicamba drift has become a common issue for farmers across the United States.[15] In 2016, a weed consultant remarked that the dicamba damage made it "look[] like a bomb went off in some parts of the South."[16]

Notably, the consultant made this comment in early July.[17] The first post-emergent (i.e., applied after crops emerge from the ground) versions of dicamba would not be approved until November of 2016.[18] Drift damage in July of 2016 indicated that farmers were illegally applying volatile pre-emergent versions of dicamba that were neither designed nor permitted for post-emergent use.[19] These pre-emergent versions of dicamba were designed for weed burndowns when crops were not growing in fields and when temperatures were cooler, thereby reducing the potential for drift.[20]

12. *Id.*

13. *Id.*

14. Jones v. State, 582 S.W.3d 847 (Ark. Ct. App. 2019) (affirming Jones' conviction and sentencing).

15. Celludot LLC, *Vapor Drift Reduction of Dicamba Herbicide Using a Nanocellulose-Based Adjuvant*, RSCH. EDUC. & ECON. INFO. SYS., U.S. DEP'T OF AGRIC. (Aug. 31, 2023), https://portal.nifa.usda.gov/web/crisprojectpages/1028627-vapor-drift-reduction-of-dicamba-herbicide-using-a-nanocellulose-based-adjuvant.html [https://perma.cc/B27Y-2DF8].

16. Pam Smith, *Year-Long Drama Over Herbicide Trait Technology*, PROGRESSIVE FARMER (Dec. 27, 2016, 9:25 AM) [hereinafter Smith, *Year-Long Drama*], https://www.dtnpf.com/agriculture/web/ag/news/article/2016/12/27/year-long-drama-herbicide-trait [https://perma.cc/FN5A-HTLB].

17. *Id.*

18. U.S. ENV'T PROT. AGENCY, FINAL REGISTRATION OF DICAMBA ON DICAMBA-TOLERANT COTTON AND SOYBEAN 3 (2016), https://aglaw.psu.edu/wp-content/uploads/2021/03/Dicamba-XtendiMax-Conditional-Registration-11.9.16.pdf [https://perma.cc/RMV6-2NPT] (granting conditional registration to post-emergent dicamba on genetically modified cotton and soybeans).

19. Smith, *Year-Long Drama*, *supra* note 16 ("[S]eed companies again warned growers that making an in-crop application of any dicamba herbicide product . . . would be a violation of federal and state law.").

20. *Id.*

The following year would be detrimental in terms of damage from dicamba drift.[21] Approximately 3.6 million acres of soybeans were reportedly damaged by dicamba drift in 2017.[22] In Arkansas alone that year, farmers filed 986 drift complaints reporting an estimated 900,000 acres of damaged soybeans.[23]

With respect to crops other than soybeans, Missouri recorded drift damage to 18,904 tomato plants, 758 acres of peaches, and 24 acres of USDA Certified Organic vegetables in 2017, among others.[24] Dicamba drift damage to USDA Certified Organic crops is particularly devastating because drift onto such crops can cause the USDA to revoke that farm's organic certification for failing required pesticide residue tests.[25] While data for non-soybean crops is otherwise sparse for 2017, this data from Missouri indicates that crops other than soybeans have suffered significant levels of drift damage.[26]

Despite repeated attempts by EPA and state agencies to fix the situation, dicamba drift continues to adversely affect farmers, with data showing that the damage is worsening year over year.[27] By July of 2021, several states including Arkansas, Iowa, and Illinois had each reported over 100 complaints of herbicide

21. *See* Kevin Bradley, *A Final Report on Dicamba-Injured Soybean Acres*, INTEGRATED PEST MGMT., UNIV. OF MO. (Oct. 30, 2017) [hereinafter Bradley, *A Final Report on Dicamba*], https://ipm.missouri.edu/cropPest/2017/10/final_report_dicamba_injured_soybean/? [https://perma.cc/869F-8NJA].

22. *Id.*

23. *Id.*

24. Brian Dintelmann et al., *Evaluations of Dicamba and 2,4-D Injury on Common Vegetable and Flower Species*, MIZZOU WEED SCI., 3 (2018), https://weedscience.missouri.edu/slideshows/Vegetable%20Injury%20with%20Dicamba%20and%202,4-D%202018.pdf [https://perma.cc/E3R5-X8YA].

25. PAMELA COLEMAN, U.S. DEP'T OF AGRIC., GUIDE FOR ORGANIC CROP PRODUCERS 9–10 (2012), https://www.ams.usda.gov/sites/default/files/media/GuideForOrganicCropProducers.pdf [https://perma.cc/NF8X-Y58F].

26. Kevin Bradley, *July 15 Dicamba Injury Update. Different Year, Same Questions*, INTEGRATED PEST MGMT., UNIV. OF MO. (July 19, 2018) [hereinafter Bradley, *July 15 Dicamba Injury Update*], https://ipm.missouri.edu/cropPest/2018/7/July-15-Dicamba-injury-update-different-year-same-questions/ [https://perma.cc/HT9L-3GS6].

27. Celludot LLC, *supra* note 15; Emily Unglesbee, *Herbicide Injury on the Rise*, PROGRESSIVE FARMER (July 21, 2021, 3:38 PM) [hereinafter Unglesbee, *Herbicide Injury*], https://www.dtnpf.com/agriculture/web/ag/crops/article/2021/07/21/battle-lines-drawn-dicamba-injury [https://perma.cc/V3XL-K4GZ]; Nicholas Brown, *Post-Emergent Dicamba Likely Unavailable in 2025, Controversial Beyond Then*, S. AG TODAY (Oct. 18, 2024), https://southernagtoday.org/2024/10/18/post-emergent-dicamba-likely-unavailable-in-2025-controversial-beyond-then/ [https://perma.cc/4ZZX-J37Q].

drift-related damage for the year.[28] The owner of a prominent seed company told the EPA that he believes "dicamba has caused more damage to American agriculture than anything [he has] witnessed in [his] lifetime."[29]

C. Finding an Optimal Solution

This summary of dicamba drift is significantly abbreviated, but the magnitude of the problem is clear.[30] The farming methods of America's most significant cash crops are in direct conflict with each other. On the one hand, many dicamba applicators (i.e., dicamba users) have consistently violated the private property rights of non-dicamba farmers by allowing the herbicide to drift onto and damage their neighbors' crops.[31] On the other hand, manufacturers originally marketed dicamba to these applicators with the premise that drift would not occur.[32] Many farmers who have experienced losses from dicamba drift have sued dicamba manufacturers alleging violations of the Lanham Act as well as numerous torts.[33] Despite attempts by pesticide companies to resolve the issue and increased government oversight, dicamba drift remains a major issue in American agriculture today.[34]

Numerous proposals have been made to re-structure United States policy on pesticides.[35] The most straightforward solution to the problem at hand is to outright ban the use of post-emergent dicamba.[36] Another proposal suggested a change in

28. Unglesbee, *Herbicide Injury*, *supra* note 27 (citing Arkansas' 444 herbicide injury complaints, Iowa's 218 pesticide misuse complaints, and Illinois' 165 pesticide misuse complaints).

29. *Id.* (quoting Harry Stine).

30. *See id.*

31. *See* Smith, *Year-Long Drama*, *supra* note 16.

32. *Id.* (noting that DuPont and Monsanto claimed new versions of dicamba herbicide to be less volatile).

33. *In re* Dicamba Herbicides Litig., 359 F. Supp. 3d 711, 720–21 (E.D. Mo. 2019) (considering plaintiff's argument that "Monsanto made misrepresentations in violation of the Lanham Act . . . that were false or misleading in convincing third-party farmers to purchase and use dicamba-resistant seed and dicamba herbicide, causing injury . . . ."); Lanham Act, 15 U.S.C. § 1125(a) (creating civil liability for manufacturers who make statements or advertisements that deceive consumers regarding their products); Bader Farms, Inc. v. Monsanto Co., 39 F.4th 954, 961 (8th Cir. 2022).

34. Brown, *supra* note 27.

35. Sarah Zimmerman, *7 Ways Pesticide Regulation Changed in 2024*, AGRIC. DIVE (Dec. 16, 2024), https://www.agriculturedive.com/news/pesticide-reulgation-us-epa-dicamba-dachtal-environment/735641/ [https://perma.cc/3M6F-XGCA].

36. *See* Nat'l Fam. Farm Coal. v. U.S. Env't Prot. Agency, 960 F.3d 1120, 1123–25 (9th Cir. 2020) (vacating the EPA's registrations of post-emergent versions of dicamba).

state-level trespass jurisprudence in order to facilitate individual farmer recovery of drift-related damages.[37] Several proposals have provided more wide-ranging answers that have extensive implications on domestic and international agriculture.[38] One of these proposals involves the incorporation of the Endangered Species Act (ESA) into seed and pesticide approval processes.[39] The absolute broadest proposal has called for a worldwide switch to organic agriculture.[40]

Ultimately, these proposals fail to sufficiently consider Congress' intent indicated by the cost-benefit analysis established under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).[41] As will be discussed in more detail below, this cost-benefit analysis require`es the EPA to weigh the economic, environmental, and human health aspects of a pesticide submitted for registration.[42] Though this cost-benefit analysis was created to set a standard for pesticide registration, congressional intent underlying the entire pesticide regulatory structure was made clear.[43] By creating this cost-benefit analysis, Congress intended for an approved pesticide to maximize agricultural efficiency while minimizing harms to the environment and human health.[44]

To provide objective grading criteria that align with Congress' intent established in FIFRA, this Article uses a balancing test similar to FIFRA's cost-benefit analysis in an attempt to qualitatively measure the pros and cons of proposals designed to remedy the ongoing dicamba situation. As such, proposals will be graded with respect to their impact on agricultural efficiency, the environment, and human health (collectively referred to as social welfare, at times).[45] Using this method, the above-stated proposals are graded with respect to their effects on social welfare under FIFRA's cost-benefit analysis in a manner that resembles the pesticide registration process.

37. Terence J. Centner, *Damages from Pesticide Spray Drift Under Trespass Law*, 41 ECOLOGY L. CURRENTS 1, 16–17 (2014) [hereinafter Centner, *Damages from Pesticide Spray Drift Under Trespass Law*].

38. *See* Kjirsten C. Durand-Johnson, Note, *"Productive Harmony:" Using NEPA and the ESA to Mitigate Pesticide Field Trials*, 13 ELON L.J. 232, 253–54 (2020).

39. *See id.* at 260.

40. Adrian Muller et al., *Strategies for Feeding the World More Sustainably with Organic Agriculture*, NATURE COMMC'NS, Nov. 14, 2017, at 1, 2.

41. *See* 7 U.S.C. § 136(bb) (requiring pesticide approval to consider "the economic, social, and environmental costs and benefits" as well as human health risks).

42. *See* discussion *infra* Section II.B.

43. *See* JERRY H. YEN ET AL., CONG. RSCH. SERV., RL31921, PESTICIDE LAW: A SUMMARY OF THE STATUTES 6 (2012).

44. *See id.* at 1, 5; 7 U.S.C. § 136(bb).

45. *See* 7 U.S.C. § 136(bb).

Few, if any, proposals will satisfy a threshold for simultaneous improvements to agricultural efficiency, environmental safety, and consumer health. This challenge is made even more difficult by individual preferences. For example, farmers are likely to be more concerned than most individuals about agricultural efficiency, though their interests in environmental and consumer health are not insignificant. On the other hand, environmental activist groups might heavily weigh environmental health over agricultural efficiency, with consumer health concerns falling somewhere in the middle of their priorities. Despite the difficulty of this challenge, the magnitude of the situation requires a solution, and the balancing test inspired by FIFRA's registration scheme offers the perfect format to measure proposals with respect to their effect on social welfare. Part II of this Article begins with an introduction to the modern agriculture industry, including both economic and legal aspects. The Part's aim is to illustrate how dicamba drift became such a pervasive issue in the agriculture industry. Part III then analyzes various proposed solutions under the above-stated balancing test. Finally, Part IV discusses several recommendations that provide a larger increase in social welfare than existing proposals would yield.

II. BACKGROUND

A. Overview of Modern Agriculture

For purposes of this Article, crop production will be divided into three distinct categories: genetically modified (GM), USDA Certified Organic, and crops that fall under neither category (hereinafter referred to as "conventional crops").[46] Misinformation concerning these categories of crop production is rampant.[47] As such, definitions are provided for each category.

The World Health Organization defines genetically modified organisms (GMOs) as organisms (for the purposes of this Article, crop seeds) that have

46. ROBERT EHN & JENNIFER FOX, AM. SUGARBEET GROWERS ASS'N, A COMPARATIVE ANALYSIS OF CONVENTIONAL, GENETICALLY MODIFIED (GM) CROPS AND ORGANIC FARMING PRACTICES AND THE ROLE OF PESTICIDES IN EACH 2, 8–9 (2019), https://americansugarbeet.org/wp-content/uploads/2019/04/A-Comparative-Analysis-of-Coventional-Genetically-Modified-GM-Crops-and-Organic-Farming-Practices-and-the-Role-of-Pesticides-in-Each.pdf [https://perma.cc/5M43-V686] (providing the distinctions of GM, USDA Certified Organic, and conventional crops).

47. *Id.* at 24 (noting that, despite consumer perceptions, USDA Certified Organic crop production versus GM and conventional production methods does not provide any environmental benefits or unmatched nutritional benefits).

undergone alterations to their DNA.[48] Most GM crops have undergone alterations in order to develop resistance to a particular herbicide or to make the plant itself resistant to insects.[49] These two types of GM crops are called herbicide-tolerant (HT) and insect-resistant (Bt), respectively.[50] GM crops have become commercially popular among farmers because of increased yields.[51] As of 2024, there are eleven commercially available GM crop varieties in the United States.[52]

Under the Organic Foods Productions Act, "organic" is simply a "labeling term that refers to an agricultural product produced in accordance with the Act."[53] The issuance of USDA Certified Organic labels is governed by the National Organic Program, a regulatory program within the USDA Agricultural Marketing Service.[54] The transition to growing USDA Certified Organic crops requires developing and implementing an Organic System Plan (OSP).[55] For crop farming, an OSP will outline the crops to be grown and which organic inputs and techniques will be used (e.g., natural pesticides, natural fertilizer, crop rotation).[56]

While the direct costs of transitioning to organic cropland are relatively low, the indirect costs can be comparatively high.[57] The transition to organic occurs

48. *Frequently Asked Questions on Genetically Modified Foods*, WORLD HEALTH ORG. (May 1, 2014), https://www.who.int/foodsafety/areas_work/food-technology/faq-genetically-modified-food/en/ [https://perma.cc/873W-7VGF].

49. Laura Dodson, *Adoption of Genetically Engineered Crops in the United States – Recent Trends in GE Adoption*, ECON. RSCH. SERV., U.S. DEP'T OF AGRIC. (Jan. 4, 2025), https://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us/recent-trends-in-ge-adoption.aspx [https://perma.cc/F3SV-AJ3W].

50. *Id.*

51. *Id.*; EHN & FOX, *supra* note 46, at 9.

52. *GMO Crops, Animal Food, and Beyond*, U.S. FOOD & DRUG ADMIN. (Mar. 5, 2024), https://www.fda.gov/food/agricultural-biotechnology/gmo-crops-animal-food-and-beyond [https://perma.cc/M6A7-LDEH] (noting that GM varieties exist for corn, soybean, cotton, potato, papaya, summer squash, canola, alfalfa, apple, sugar beet, and pink pineapple).

53. 7 C.F.R. § 205.2 (2025).

54. *USDA Certified Organic: Understanding the Basics*, AGRIC. MKTG. SERV., U.S. DEP'T OF AGRIC. (Mar. 15, 2025, 12:34 PM), https://www.ams.usda.gov/services/organic-certification/organic-basics [https://perma.cc/H3EE-X6F4].

55. AGRIC. MKTG. SERV., U.S. DEP'T OF AGRIC., A GUIDE FOR CONVENTIONAL FARMERS TRANSITIONING TO ORGANIC CERTIFICATION 2 (2025), https://www.ams.usda.gov/sites/default/files/media/10%20Guide%20to%20Transitional%20Farming%20FINAL%20RGK%20V2.pdf [https://perma.cc/9HPS-AW95].

56. *Id.* at 2, 5.

57. Mahboubeh Jahantab et al., *Farmland Allocation in the Conversion from Conventional to Organic Farming*, 311 EUR. J. OPERATIONAL RSCH. 1103, 1103 (2023) ("An organic farming system requires farmers not to utilize any synthetic chemicals including

over a three-year period in which a farmer must abide by the OSP but cannot market the commodities sold with the USDA Certified Organic label.[58] In other words, the farmer must adopt relatively inefficient farming practices while forgoing any price premium for the crops for three years.[59]

Pesticide and herbicide drift can pose an even greater risk to organic crops than their conventional or GM counterparts because of the associated auditing requirements imposed on organic farms.[60] If tests indicate that organic cropland exceeds a synthetic pesticide residue level of 5%, that cropland may ultimately lose its organic certification.[61] This result can occur regardless of whether the pesticides were applied by that farmer or a neighboring farmer via drift.[62] Once organic certification is lost, a farmer wishing to continue organic farming must repeat the entire certification process, including the three-year transition period without the label.[63]

The category of conventional crop production is a catch-all category. For the purposes of this Article, conventional crops are crops that are neither GM nor

fertilizers or pesticides, which potentially results in a *decrease in the crop's yield* while its *sale price remains the same* . . . ." (emphasis added)).

58. *Becoming a Certified Operation*, AGRIC. MKTG. SERV., U.S. DEP'T OF AGRIC. (Jan. 31, 2025, 6:10 PM), https://www.ams.usda.gov/services/organic-certification/becoming-certified [https://perma.cc/E93X-QDVB].

59. *See* Jahantab et al., *supra* note 57, at 1103.

60. *See Organic Certification Requirements: The Strict USDA Standards*, ORGANIC PRODUCE NETWORK (Jan. 5, 2024), https://www.organicproducenetwork.com/regulatory/organic-certification-requirements-strict-usda-standards [https://perma.cc/FVZ5-B9RD] ("Thorough certification audits by third-party inspectors, both announced and unannounced, are done annually for every organic farm, handler, and processor to ensure products labeled organic are grown, processed and handled in accordance with the rigorous USDA organic standards.").

61. COLEMAN, *supra* note 25, at 9–10.

62. ELIZABETH MAYNARD ET AL., PURDUE UNIV., WATCH OUT FOR: PESTICIDE DRIFT AND ORGANIC PRODUCTION 2 (2012), https://www.extension.purdue.edu/extmedia/HO/DW-1-W.pdf [https://perma.cc/FBZ7-3BEX]. Notably, in *Johnson v. Paynesville Farmers Union Coop. Oil Co.*, the Minnesota Supreme Court declined to accept the theory that third-party pesticide drift could result in a farmer losing their organic certification. 817 N.W.2d 693, 711 (Minn. 2012). Beginning in 2013 (i.e., the year after the *Johnson* ruling), the USDA instituted the Final Rule for Periodic Residue Testing, which states that organic cropland with greater than a 5% synthetic pesticide residue level, including from third-party pesticide drift, will lose its USDA Certified Organic status. NAT'L ORGANIC PROGRAM, U.S. DEP'T OF AGRIC., CERTIFIED AGENT TRAINING: PERIODIC RESIDUE TESTING 3, 11–15 (2018), https://www.ams.usda.gov/sites/default/files/media/TrainingPeriodicResidueTesting.pdf [https://perma.cc/ZG6C-J24F].

63. COLEMAN, *supra* note 25, at 46.

organic.[64] Unlike GM crops, conventional crops are not artificially resistant to herbicides or insects.[65] Unlike organic crops, conventional crops carry no price premium, notwithstanding consumers who disfavor GM products but are indifferent to organic products.[66] Conventional cropland can however receive applications of synthetic pesticides, herbicides, and fertilizers.[67] Conventional farming is the main supplier of crops without an available GM variety, such as carrots.[68]

All three means of crop production have secured their positions in the domestic marketplace, albeit at different levels of output. In 2019, over 176 million acres of farmland in the United States produced GM crops.[69] In contrast, organic cropland in 2019 was listed at just over 3.5 million acres.[70] Based on this Article's definition of conventional crops, the acreage for conventional crop production can be calculated by subtracting GM and organic acres from total United States cropland. This calculation indicates that total conventional cropland in 2019 was approximately 73.2 million acres.[71]

64. U.S. DEP'T OF AGRIC., USDA COEXISTENCE FACT SHEETS: CONVENTIONAL FARMING 1 (2015), https://www.usda.gov/sites/default/files/documents/coexistence-conventional-farming-factsheet.pdf [https://perma.cc/4JAE-PQDF] ("Conventional farming is the use of seeds that have been genetically altered using a variety of traditional breeding methods, excluding biotechnology, and are not certified as organic.").

65. EHN & FOX, *supra* note 46, at 8–9.

66. Sharon Raszap Skorbiansky et al., *Rising Consumer Demand Reshapes Landscape for U.S. Organic Farmers*, ECON. RSCH. SERV., U.S. DEP'T OF AGRIC.: AMBER WAVES (Nov. 14, 2023), https://www.ers.usda.gov/amber-waves/2023/november/rising-consumer-demand-reshapes-landscape-for-u-s-organic-farmers [https://perma.cc/E5Y9-RGGX].

67. EHN & FOX, *supra* note 46, at 8–9.

68. *See*, *e.g.*, *Quick Stats*, NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC. (2016), https://quickstats.nass.usda.gov/results/CE3B23D5-A9EB-3035-BCB2-AC978D14548A [https://perma.cc/TT5B-XAK4]; *see also GMO Crops, Animal Food, and Beyond*, *supra* note 52.

69. INT'L SERV. FOR THE ACQUISITION OF AGRI-BIOTECH APPLICATIONS, POCKET K NO. 16: BIOTECH CROP HIGHLIGHTS IN 2019, at 2 (2021), https://www.isaaa.org/resources/publications/pocketk/document/Doc-Pocket%20K16-2020.pdf [https://perma.cc/BBL6-Q3N3].

70. NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC., No. AC-17-SS-4, 2019 ORGANIC SURVEY 1 (2020) [hereinafter 2019 ORGANIC SURVEY], https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics/ORGANICS.pdf [https://perma.cc/2MQ6-HM3W].

71. *See* M. Shahbandeh, *Total U.S. Cropland Area Projection from 2012 to 2028 (in Million Acres)*, STATISTA (July 27, 2022), https://www.statista.com/statistics/201762/projection-for-total-us-cropland-area-from-2010/ (estimating conventional cropland by subtracting GM cropland of 176 million acres and

As the dicamba debate is largely centered around soybeans, a breakdown of soybean production methods can further indicate the true significance of this issue for soybean farmers. USDA Farm Service Agency data from 2019 indicates that total soybean acres was just over 75 million acres.[72] In 2019, 94% of all soybean crops planted were herbicide-tolerant (70.5 million acres).[73] Notably, 43% of total soybean acreage in 2018 was planted with dicamba-tolerant seeds (a similar figure for 2019 is not readily available).[74] Organic soybean acres harvested in 2019 was listed at about 170,000 acres, which constitutes approximately 0.2% of total soybean acreage for 2019.[75] Thus, conventional soybean acreage in 2019 was approximately 5.8% of total soybean acreage (4.35 million acres).[76]

Significant confusion also exists with respect to the fact that there are multiple types of pesticide drift. Most people associate pesticide drift with particle

organic cropland of 3.5 million acres from total cropland of 252.7 million acres). It is worth noting that this Article uses 2019 data in this paragraph because of lags in data collection across cropland acreage. The most recent organic data arises out of USDA's 2021 Organic Survey, but there is not a reliable estimate of GM cropland acres during 2021. The previous organic survey was conduct in 2019, and there is reliable GM cropland acreage data for 2019, which allows for the calculation of conventional cropland acreage. Again, this data is drawn from across all domestic cropland acreage and not any specific crop variety, though methods of soybean production are covered in the next paragraph to provide an illustration of how popular the GM option is amongst farmers when a GM option is available.

72. *Crop Acreage Data*, FARM SERV. AGENCY, U.S. DEP'T OF AGRIC. (Jan. 10, 2020), https://www.fsa.usda.gov/tools/informational/freedom-information-act-foia/electronic-reading-room/frequently-requested/crop-acreage-data [https://perma.cc/BPC8-YXG9].

73. *Id.*; Dodson, *supra* note 49 (referring to the chart data for the 94% figure and calculating 70.5 million acres by multiplying 94% by the total soybeans acres planted).

74. Seth J. Wechsler et al., *The Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds Has Increased Quickly, Benefiting Adopters but Damaging Crops in Some Fields*, ECON. RSCH. SERV., U.S. DEP'T OF AGRIC.: AMBER WAVES (Oct. 1, 2019) [hereinafter Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*], https://www.ers.usda.gov/amber-waves/2019/october/the-use-of-genetically-engineered-dicamba-tolerant-soybean-seeds-has-increased-quickly-benefiting-adopters-but-damaging-crops-in-some-fields/ [https://perma.cc/9MS2-777G].

75. 2019 ORGANIC SURVEY, *supra* note 70, at 120; *Crop Acreage Data*, *supra* note 72. The percentage of organic soybean acres is calculated by dividing 170,000 by total soybean acres of 75,000,000. A similar figure for acres planted is not readily available. 2019 Organic Survey, *supra* note 70, at B-2.

76. The conventional soybean acreage percentage was estimated by subtracting the percent of GM soybean acres planted (94%) and organic acres (0.2%) from 100%. The number of conventional soybean acres was then calculated by multiplying 5.8% by the total soybean acres planted.

drift.[77] Particle drift occurs when pesticide droplets are applied to a target field but land in a non-target area.[78] The most common example of particle drift is a crop-dusting aircraft where pesticides are blown from the aircraft by wind onto a non-target field.[79] The other type of pesticide drift is vapor drift.[80] Vapor drift occurs when the pesticide lands on its target field, but subsequently volatizes.[81] Once volatized, these pesticide vapors enter the atmosphere and move above another field before condensing onto that field's crops.[82] Both older and newer versions of dicamba are relatively volatile and therefore prone to vapor drift.[83]

B. Government Oversight of Herbicide-Tolerant Crop Systems

Government oversight of herbicide-tolerant crop systems is primarily divided between the USDA and EPA.[84] The USDA oversees the registration process of seeds under the Plant Protection Act (PPA).[85] The EPA oversees the registration process of herbicides under FIFRA, though state agricultural agencies play integral roles as well.[86] The separated registration processes can result in a seed being approved before its corresponding herbicide, which in fact happened with the introduction of dicamba-tolerant crop systems.[87]

77. *See Pesticide Drift*, NAT'L PESTICIDE INFO. CTR. (Nov. 18, 2024), http://npic.orst.edu/reg/drift.html [https://perma.cc/NMS9-6XE7].

78. *Id.*

79. *See* Christopher Collins, *Investigation Finds Culprit in Panhandle 'Chemical Drift' Case, State Yet to Take Action*, TEX. OBSERVER (Mar. 19, 2018, 1:36 PM), https://www.texasobserver.org/investigation-finds-culprit-in-panhandle-chemical-drift-case-state-takes-no-action/ [https://perma.cc/VTK9-EXT4].

80. *See Pesticide Drift*, *supra* note 77.

81. Fred Fishel, *Pesticides and the Environment*, UNIV. OF MO. EXTENSION (Feb. 2003), https://extension.missouri.edu/publications/g7520 [https://perma.cc/4VSE-DKD8].

82. *See id.*

83. *See* Bob Hartzler, *Factors Influencing Dicamba Volatility*, IOWA STATE UNIV.: INTEGRATED CROP MGMT. (Aug. 16, 2017), https://crops.extension.iastate.edu/blog/bob-hartzler/factors-influencing-dicamba-volatility [https://perma.cc/2GJP-NNTA].

84. *EPA's Regulation of Biotechnology for Use in Pest Management*, ENV'T PROT. AGENCY (Dec. 31, 2024), https://www.epa.gov/regulation-biotechnology-under-tsca-and-fifra/epas-regulation-biotechnology-use-pest-management [https://perma.cc/AJ6D-A8ZG].

85. 7 U.S.C. § 7702(16) (tasking the Secretary of Agriculture with oversight of the PPA); *Plant Variety Protection*, AGRIC. MKTG. SERV., U.S. DEP'T OF AGRIC. (Mar. 15, 2025, 8:27 PM), https://www.ams.usda.gov/services/plant-variety-protection [https://perma.cc/6TS2-F6BT].

86. 7 U.S.C. § 136a (requiring all pesticides to be registered with the EPA); 7 U.S.C. § 136v (establishing authority of states under FIFRA).

87. Smith, *Year-Long Drama*, *supra* note 16.

Despite the two-pronged approach to herbicide-tolerant crop regulation, this Article places more focus on the EPA's actions under FIFRA than the USDA's actions under PPA. The USDA's role, while important, has received far less scrutiny than the EPA from groups on both sides of the dicamba debate.[88] After all, it is the herbicide, not the seed, that is drifting and causing damage to other farmers' crops.[89]

The EPA, under FIFRA, regulates pesticides in cooperation with state governments.[90] The EPA is responsible for pesticide registration and labeling under FIFRA, among other duties.[91] In an effort to focus FIFRA's protections on human health and the environment, Congress relieved the EPA of the responsibility to test pesticide efficacy in 1978.[92] Still, the EPA might inquire about it when considering the registration.[93]

When a pesticide is submitted for registration under FIFRA, the EPA possesses discretion to approve either a conditional or an unconditional registration.[94] Unconditional registration is granted when the EPA concludes that additional data review is unnecessary, among other aspects.[95] Conversely, conditional registration is granted when the EPA determines that further data or action is required from the registrant.[96]

88. *See* Emily Unglesbee, *Dicamba Faces Legal Battlefield*, PROGRESSIVE FARMER (Feb. 5, 2021, 12:10 PM) [hereinafter Unglesbee, *Dicamba Faces Legal Battlefield*], https://www.dtnpf.com/agriculture/web/ag/crops/article/2021/02/05/epa-faces-multiple-dicamba-lawsuits [https://perma.cc/JD8G-F5DT].

89. *Pesticide Drift*, *supra* note 77.

90. 7 U.S.C. § 136u.

91. 40 C.F.R. § 158.130 (2025) (providing data requirements for pesticide registration); 7 U.S.C. § 136(q) (defining "misbranding" under FIFRA).

92. Alexandra B. Klass, *Bees, Trees, Preemption, and Nuisance: A New Path to Resolving Pesticide Land Use Disputes*, 32 ECOLOGY L.Q. 763, 773–74 (2005) ("EPA obtained permission from Congress in the 1978 FIFRA Amendments to waive data requirements relating to pesticide 'efficacy' in order to better use its resources to evaluate health and environmental effects.").

93. Richard P. Hubner, *Registration of Pesticides in the U.S.: Understanding the Process*, *in* PESTICIDES LAW HANDBOOK 21, 35 (Marshall Lee Miller ed. 1999) ("Sometimes EPA looks carefully at efficacy data, sometimes not.").

94. 40 C.F.R. § 152.112 (2025) (providing criteria for unconditional registration); *id.* § 152.113 (providing criteria for conditional registration).

95. *Id.* § 152.112(c).

96. *Id.* § 152.113(a)(3).

Notably, data presented to the EPA during the registration process is provided by the registrant.[97] While the EPA could request additional data, the EPA essentially relies on the data that has already been provided.[98] Critics have voiced displeasure over this aspect of FIFRA.[99] The main concern is that registrants have no reason to provide data that portrays their pesticide negatively, especially without a clear duty to provide it.[100]

The other often-criticized aspect of the registration process under FIFRA pertains to the standard of approval for the EPA.[101] The EPA will approve a pesticide's registration if the pesticide does not present any "unreasonable adverse effects on the environment."[102] The term "unreasonable adverse effects on the environment" is defined in FIFRA as "taking into account the economic, social, and environmental costs and benefits of the use of any pesticide."[103]

Thus, the EPA performs a cost-benefit analysis when contemplating the registration of a pesticide.[104] Given the consideration of economic, social, and environmental aspects, a pesticide that causes an environmental or human health detriment could be registered if the EPA determines that an economic benefit is overriding.[105]

97. Terence J. Centner, *Pesticide Registration Fails to Protect Human Health: Damages from Exposure to Glyphosate-Based Herbicides*, 36 J. ENV'T L. & LITIG. 69, 78 (2021) [hereinafter Centner, *Pesticide Registration Fails to Protect Human Health*].

98. *Id.*

99. *See* WINTHROP ROCKEFELLER INST., REPORT OF THE 2017 STATE OF ARKANSAS DICAMBA TASK FORCE MEETINGS 11 (2017), https://www.centerforfoodsafety.org/files/arkansas-dicamba-task-force-report—9-21-17_39181.pdf [https://perma.cc/VZ8F-UDWA] (calling for additional independent and university testing of pesticides before market approval).

100. Centner, *Pesticide Registration Fails to Protect Human Health*, *supra* note 97, at 79 ("[T]here is little incentive for registrants to look for disparaging information and no clear duty to report information or data gathered by others.").

101. *See id.* at 81–82.

102. 7 U.S.C. § 136(bb); Nat'l Fam. Farm Coal. v. U.S. Env't Prot. Agency, 960 F.3d 1120, 1133 (9th Cir. 2020).

103. 7 U.S.C. § 136(bb).

104. Centner, *Pesticide Registration Fails to Protect Human Health*, *supra* note 96, at 84 ("FIFRA has been interpreted as delineating a cost-benefit analysis.").

105. Terence J. Centner, *Pesticide Usage Is Compromising People's Health in the United States: Ideas for Reducing Damages*, AGRICULTURE, May 24, 2021, at 1, 5 ("[I]f benefits to agricultural production are great enough, considerable harm to agricultural workers is allowed. Moreover, children of agricultural workers are sometimes exposed to pesticides . . . .").

The EPA is also responsible for ensuring that the labels attached to pesticides and related products enable applications that are adequate to protect human health and the environment.[106] It is a violation of FIFRA to apply a registered pesticide in a way that is inconsistent with its labeling.[107] Despite the potential for dishonesty, applicators of registered pesticides are tasked with maintaining their own records.[108] Falsifying application records is understandably a FIFRA violation.[109] Despite this requirement, proving that these records were falsified carries a heavy burden of proof due to issues with evidence collection.[110]

The significance of the EPA's responsibility to ensure proper pesticide labeling is heightened by the lack of a private right of action against manufacturers for violation of labeling requirements.[111] As noted by commentators, the lack of a private right of action impedes FIFRA enforcement and oftentimes precludes compensation for farmers who have suffered losses due to a FIFRA violation.[112]

Prior to 2005, states played a fairly minor role in pesticide regulation under FIFRA.[113] Pre-2005 and today, states are permitted to establish minimum training standards for pesticide applicators.[114] Still, the EPA is allowed to cooperate with states on the development and maintenance of training programs.[115] States are assigned primary enforcement responsibility under FIFRA, but the EPA can choose to revoke this responsibility if it determines that a state is not carrying it out.[116] Like the EPA, states have the authority to inspect pesticide facilities.[117]

While 7 U.S.C. § 136v could be interpreted to give states broad authority, the "inducement test" historically precluded many actions by states that could be

106. 7 U.S.C. § 136(q)(1)(F).

107. *Id.* § 136j(a)(2)(G).

108. *Id.* § 136j(a)(2)(B).

109. *Id.* § 136j(a)(2)(M).

110. *See* Centner, *Pesticide Registration Fails to Protect Human Health*, *supra* note 97, at 92–93.

111. *See* Voss v. Saint Martin Coop., 376 F. App'x 662, 663 (8th Cir. 2010).

112. Klass, *supra* note 92, at 778.

113. *See* Bates v. Dow Agrosciences LLC, 544 U.S. 431, 445–46 (2005) (declining to hold that a state-law claim is pre-empted if it would induce a manufacturer to alter its label, thereby expanding the scope of permissible state actions relating to pesticides).

114. 7 U.S.C. § 136w-5.

115. *Id.* § 136u.

116. *Id.* § 136w-1 (assigning states primary enforcement responsibility); *Id.* § 136w-2(b) (enabling the EPA to revoke a state's enforcement responsibility if the state's program is inadequate).

117. *Id.* § 136g.

construed as regulating pesticides.[118] The inducement test arose from Section 136v's pre-emption clause, which declares states preempted under FIFRA from imposing labeling or packaging requirements for pesticides or devices outside of those requirements already imposed by the EPA.[119] The provision was taken to an extreme, which all but eliminated the state's role in the regulatory process.[120] This test held that, "A farmer's claim is "preempted by FIFRA's express preemption clause [if] success on such claims would necessarily induce [a manufacturer] to alter its product label."[121] In 2005, the United States Supreme Court rejected the inducement test, enabling states to expand their pesticide regulatory authority.[122] It held FIFRA only "pre-empts competing state labeling standards . . . that would create significant inefficiencies for manufacturers."[123] The advent of dicamba-tolerant crop systems would facilitate an opportunity for states to test the bounds of their newfound regulatory authority.

C. What Happened

Though the uproar around dicamba began with the introduction of dicamba-tolerant crop systems, farmers have used dicamba for over 50 years.[124] Prior to the incorporation of dicamba into herbicide-tolerant crop systems, farmers used dicamba only as a pre-emergent.[125] In this capacity, a farmer would apply dicamba before the farmer had sown the seeds in a field in order to kill the weeds that had

118. *Id.* § 136v(a) ("A State may regulate the sale or use of any federally registered pesticide or device in the State, but only if and to the extent the regulation does not permit any sale or use prohibited by this Act . . . ."); Dow Agrosciences LLC v. Bates, 332 F.3d 323, 333 (5th Cir. 2003), *vacated*, 544 U.S. 431 (2005).

119. *Dow Agrosciences LLC*, 332 F.3d at 331; 7 U.S.C. § 136v(b).

120. *See Dow Agrosciences LLC*, 332 F.3d at 331.

121. *Id.* at 333.

122. Bates v. Dow Agrosciences LLC, 544 U.S. 431, 445 (2005) ("The inducement test is unquestionably overbroad . . . .").

123. *Bates*, 544 U.S. at 452.

124. *See* Nat'l Fam. Farm Coal. v. U.S. Env't Prot. Agency, 960 F.3d 1120, 1123 (9th Cir. 2020).

125. *Id.*

grown in a field since the prior harvest.[126] Dicamba's high volatility which makes it prone to drift has been widely known for decades.[127]

In *National Family Farms Coalition v. United States Environmental Protection Agency,* the Ninth Circuit described just how volatile and prone to drift dicamba can be:

> Dicamba droplets can drift during or shortly after spraying if the wind is blowing too hard or the spraying equipment is moving too fast. Dicamba vapor can drift if dicamba is applied during a temperature inversion—an atmospheric condition in which cool air at the earth's surface traps warmer air above it, allowing the vapor to remain in a concentrated cloud and move off-field during a light wind. And dicamba vapor can drift if dicamba volatilizes after it has come to rest on plants or the ground. Dicamba can volatilize hours or even days after it has been applied, and it does so more easily and in greater volumes as the temperature rises. During temperature inversions, or after volatilizing on hot days, dicamba can drift long distances, sometimes a mile or more.[128]

Despite its susceptibility to drift, pre-emergent applications of dicamba were uncontroversial because neighboring fields were often empty as well during these application periods.[129] Thus, even if pre-emergent dicamba was drifting, there was a low likelihood of crops being above ground in any of the surrounding fields.[130]

Dicamba was incorporated into a herbicide-tolerant crop system because widespread use of glyphosate-tolerant crops led to the development of glyphosate-resistant weeds.[131] Glyphosate-tolerant crops, commonly known as Roundup Ready, were a major commercial success, with almost 90% of soybean acreage in

126. *Id.* Prior applications of dicamba as a pre-emergent were less problematic due to several factors. Ford Baldwin, *Baldwin: 2 Reasons for Increase of Off-Target Dicamba Damage*, FARM PROGRESS (July 26, 2017), https://www.farmprogress.com/soybean/baldwin-2-reasons-increase-target-dicamba-damage [https://perma.cc/UQ6H-XMMY] ("Previous uses . . . have been during periods where temperatures are cooler, susceptible crops have not emerged and perennial vegetation has not leafed out.").

127. Hartzler, *supra* note 83 (citing research from 2001 to explain 2017 drift patterns).

128. *Nat'l Fam. Farm Coal.*, 960 F.3d at 1125.

129. Brigit Rollins, *The Deal with Dicamba: Part One*, NAT'L AGRIC. L. CTR. (Feb. 14, 2020) [hereinafter Rollins, *Dicamba: Part One*], https://nationalaglawcenter.org/the-deal-with-dicamba-part-one/ [https://perma.cc/92D2-UC6V] ("By applying dicamba prior to planting, damage that could occur to crops due to the pesticide's volatility was prevented because most sensitive species had not yet emerged.").

130. *Id.*

131. Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*, *supra* note 74.

2006 being planted with glyphosate-tolerant seeds.[132] During the height of glyphosate-tolerant crop planting, many farmers exclusively used glyphosate as a means of weed control.[133] Predictably, such extensive use of glyphosate led to the aforementioned development of glyphosate-resistant weeds.[134] By 2018, the majority of soybean-producing states were dealing with glyphosate-resistant weeds.[135]

Pesticide companies were well aware of the increase in glyphosate-resistant weeds long before it reached that point in 2018.[136] In 2010, BASF and Monsanto "announced significant progress toward launching next-generation dicamba-based weed control systems . . . ."[137] This progress towards dicamba-tolerant crop systems stemmed from a joint licensing agreement between BASF and Monsanto in January of 2009.[138] The dicamba-tolerant trait would be "stacked" with a glyphosate-tolerant trait, meaning that either or both herbicides could be used on the same seeds.[139]

Monsanto and BASF's cooperation went well beyond the initial stages of research into dicamba-tolerant crop systems.[140] In fact, Monsanto and BASF coordinated herbicide registration, field trials, label recommendations, and forecasts for seed and chemistry volume.[141] Monsanto and BASF also collaborated when developing strategies for communication and commercial launch pertaining to dicamba-tolerant crop systems.[142] Perhaps most notably, Monsanto and BASF coordinated in the commercialization of both dicamba-tolerant seeds and new dicamba formulations.[143]

132. *Id.*; Rollins, *Dicamba: Part One*, *supra* note 129.

133. Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*, *supra* note 74.

134. *Id.*

135. *Id.*

136. *See* Monsanto Co., *BASF and Monsanto Announce Progress in Dicamba Formulations*, PR NEWSWIRE (Nov. 2, 2010), https://www.prnewswire.com/news-releases/basf-and-monsanto-announce-progress-in-dicamba-formulations-106514798.html [https://perma.cc/36XE-9CYK].

137. *Id.*

138. *Id.*

139. *Id.*; Rollins, *Dicamba: Part One*, *supra* note 129.

140. *See* Bader Farms, Inc. v. Monsanto Co., MDL No. 18-md-2820, 2020 WL 6939364, at *5 (E.D. Mo. Nov. 25, 2020), *modified*, 39 F.4th 954 (8th Cir. 2022).

141. *Id.* at *6.

142. *Id.*

143. *Id.*

In 2015, the USDA acting under the authority of the PPA, deregulated Monsanto's dicamba-tolerant soybean and cotton varieties, which Monsanto sold prior to the 2015 and 2016 growing seasons.[144] At this point, no post-emergent formulations of dicamba had been approved through FIFRA.[145] Thus, any farmer growing dicamba-tolerant soybeans or cotton in 2015 and 2016 would have been barred from post-emergent applications of dicamba during that time.[146] Farmers were barred from doing so because only pre-emergent formulations of dicamba had been approved by the EPA and were commercially available.[147] Despite this fact, many of the farmers who planted the nearly two million acres of dicamba-tolerant crops in 2016 illegally applied pre-emergent dicamba during the post-emergent stage of growth.[148]

Significant reports of drift-related damage ensued.[149] Bader Farms, a large peach orchard in Missouri, reported that over 7,000 peach trees received damage consistent with dicamba drift in 2015.[150] Bader Farms reported that an additional 30,000 peach trees were damaged in 2016.[151] At the end of 2016, Bader Farms's complaint of drift-related damage would be one of 124 dicamba-related complaints that the state of Missouri was actively investigating.[152] Drift damage to tree orchards is particularly bad because a tree can take years to recover from herbicide damage, if the tree survives at all.[153]

Prior to the 2017 growing season, the EPA granted conditional registrations to the first post-emergent versions of dicamba which could be used on dicamba-

144. Nat'l Fam. Farm Coal. v. U.S. Env't Prot. Agency, 960 F.3d 1120, 1126 (9th Cir. 2020); Bader Farms, Inc. v. Monsanto Co., 39 F.4th 954, 960–61 (8th Cir. 2022).

145. Nat'l Fam. Farm Coal., 960 F.3d at 1126–27 (stating that the EPA approved conditional registrations for the first post-emergent and less volatile dicamba formulations in the fall of 2016 after the growing season was over).

146. *Id.* at 1126.

147. *Id.* at 1123.

148. *Id.* at 1126 ("Record evidence contains reports that some growers illegally sprayed the old dicamba herbicides during the post-emergent phase of the 2016 growing season.").

149. *Id.* at 1127–28.

150. Smith, *Year-Long Drama*, *supra* note 16.

151. *Id.*

152. Emily Unglesbee, *Second Dicamba Lawsuit*, PROGRESSIVE FARMER (Feb. 16, 2017), https://www.dtnpf.com/agriculture/web/ag/crops/article/2017/02/16/class-action-lawsuit-filed-monsanto-2 [https://perma.cc/2WUA-XCV7] ("The Missouri Department of Agriculture said it received 124 complaints of drift in 2016.").

153. Beau Brodbeck, *Herbicide Damage in Trees*, ALA. COOP. EXTENSION SYS.: LANDSCAPING (Mar. 18, 2020), https://www.aces.edu/blog/topics/landscaping/herbicide-damage-in-trees/ [https://perma.cc/HGT2-445Q] (noting that the waiting period to determine a tree's survival can "range from a few weeks to several years").

tolerant crops.[154] The three newly approved dicamba formulations were reported as less volatile and were assigned additional restrictions via labeling requirements.[155] At the time, the EPA stated that "these formulations and labeling requirements are expected to eliminate *any* offsite exposures."[156]

The new versions of post-emergent dicamba failed to live up to the EPA's expectations.[157] Approximately 3.6 million acres of soybeans were reportedly damaged in 2017.[158] Missouri reported dicamba-related damage to crops such as rice, tomatoes, alfalfa, and watermelons.[159] Missouri also reported that several peach and apple tree orchards as well as vineyards had sustained dicamba drift damage.[160] While drift data on non-soybean crops for other states is not widely available for 2017, dicamba drift should be viewed as a problem for the entirety of American agriculture, not just soybean farms.

Leading up to the 2018 growing season, many state agricultural agencies attempted to minimize dicamba drift with regulatory solutions that were unprecedented prior to *Bates*.[161] The most prominent solution implemented by many states was a cutoff date for dicamba applications around the middle of the growing season.[162] Still, these measures only helped so much. By July 15, 2018, there were 605 official dicamba-related injury investigations across the country.[163] This number somewhat underestimates how much damage truly occurred, as certain states quit publishing their damage reports.[164] Notably, this number included investigations both into soybean and non-soybean reports.[165] Comparing

154. Nat'l Fam. Farm Coal., 960 F.3d at 1126.

155. *Id.*

156. *Id.* (emphasis added) (quoting the EPA's 2016 two-year conditional registration of post-emergent dicamba).

157. *See id.* at 1127.

158. Bradley, *A Final Report on Dicamba*, *supra* note 21.

159. Dintelmann et al., *supra* note 24, at 3.

160. *Id.*

161. Nicholas Brown & Matt Roessing, *Torts and Pesticide Drift: Amending Right-to-Farm Acts in the Wake of Widespread Dicamba Drift*, 23 J. LEGAL STUD. BUS. 1, 12–13 (2020); *see* Bates v. Dow Agrosciences LLC, 544 U.S. 431, 445 (2005).

162. Brown & Roessing, *supra* note 161, at 12–13.

163. Bradley, *July 15 Dicamba Injury Update*, *supra* note 26.

164. *Id.*

165. *Id.*

the 2018 growing season to the 2017 growing season, dicamba damage to soybeans decreased but dicamba damage to non-soybeans increased.[166]

This disparity between the trends in drift damage for soybeans and non-soybeans might be explained by an increase in farmers who planted dicamba-tolerant soybeans.[167] At first glance, the uptick in farmers who planted dicamba-tolerant soybeans might lead one to assume that dicamba itself was becoming more widely adopted as a post-emergent.[168] Data would prove this assumption false. While more farmers were planting dicamba-tolerant seeds, a significant percentage of these farmers were not applying post-emergent dicamba at all.[169] In 2018, 51% of Kentucky soybean acreage was planted with dicamba-tolerant soybeans, but only 23% of Kentucky soybean acres actually received a dicamba application.[170] Likewise, 76% of Mississippi soybean acreage in 2018 was planted with dicamba-tolerant seeds, but only 54% of Mississippi soybean acres received a dicamba application.[171] Differences in the soybean acres with dicamba-tolerant seeds versus those that were treated with dicamba were commonplace throughout the Midwestern states.[172]

Farmers oftentimes planted dicamba-tolerant seeds without ever applying post-emergent dicamba out of fear that their neighbors' lawful dicamba applications would drift onto their crops.[173] On September 14, 2017, Rob Robinson, the owner and CEO of Rob-See-Co, sent a letter to the EPA

166. Chad Smith, *Uncertainty Surrounds 2018 Dicamba Damage Report*, MIDWEST MESSENGER (Aug. 22, 2018) [hereinafter Smith, *Uncertainty Surrounds 2018 Dicamba Damage Report*], https://www.agupdate.com/midwestmessenger/news/crop/uncertainty-surrounds-2018-dicamba-damage-report/article_c617e78c-a163-11e8-8ca0-836aac29345d.html [https://perma.cc/F8WS-6XHA]. *But see* Johnathan Hettinger, *EPA Documents Show Dicamba Damage Worse Than Previously Thought*, ST. LOUIS POST-DISPATCH (Oct. 30, 2020), https://www.stltoday.com/news/local/state-and-regional/epa-documents-show-dicamba-damage-worse-than-previously-thought/article_36f21c52-7459-5ee0-8bae-21bf5e9f89d2.html (noting that drift-related damage to soybeans in 2018 was later reported to be even higher than in 2017).

167. Smith, *Uncertainty Surrounds 2018 Dicamba Damage Report*, *supra* note 166.

168. *See id.*

169. Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*, *supra* note 74.

170. *Id.*

171. *Id.*

172. *Id.*

173. Emily Flitter, *Special Report: The Decisions Behind Monsanto's Weed-Killer Crisis*, REUTERS (Nov. 9, 2017, 1:33 PM), https://www.reuters.com/article/us-monsanto-dicamba-specialreport/special-report-the-decisions-behind-monsantos-weed-killer-crisis-idUSKBN1D91PZ [https://perma.cc/MCY6-HQUR].

communicating his experiences with these farmers.[174] In this letter, Robinson stated, "Even more alarming is the number of my customers who have told me they will plant all Xtend varieties . . . as a defensive measure against damage from neighbors who will use Xtend varieties and spray the approved dicamba product."[175]

Xtend is one of the commercial names for dicamba-tolerant soybeans.[176] Due to the ability to stack herbicide-tolerant traits, Xtend soybeans are also glyphosate-tolerant.[177] As such, the farmers who simply wanted to avoid drift-related damage without incurring liability for their own dicamba drifting could plant dicamba-tolerant seeds and apply glyphosate instead.[178]

In late 2018, the EPA granted requests by Bayer CropScience, Corteva, and BASF to extend the conditional registrations for their dicamba herbicides for an additional two years.[179] The subsequent 2019 growing season would be much like the previous two growing seasons in terms of dicamba drift. Nineteen states reported almost 1,400 cases of alleged dicamba injury.[180] Several states started reporting an increase in tree damage that was believed to be associated with dicamba drift.[181]

In 2020, the Ninth Circuit in *National Family Farm Coalition v. United States Environmental Protection Agency* vacated the EPA's 2018 decision to re-register the three post-emergent versions of dicamba.[182] In their ruling, the Ninth Circuit concluded that "substantial evidence does not support the EPA's conclusion that both statutory prerequisites were satisfied."[183] The Ninth Circuit's

174. Nat'l Fam. Farm Coal. v. U.S. Env't. Prot. Agency, 960 F.3d 1120, 1142 (9th Cir. 2020).

175. *Id.*

176. Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*, *supra* note 74.

177. Amit Jhala, *Managing Soybeans with Multiple Herbicide-Resistant Traits*, NO-TILL FARMER (Apr. 9, 2021), https://www.no-tillfarmer.com/articles/10512-managing-soybeans-with-multiple-herbicide-resistant-traits [https://perma.cc/L3TV-DPD8].

178. *See id.*

179. Nat'l Fam. Farm Coal., 960 F.3d at 1129.

180. Emily Unglesbee, *Dicamba Fatigue*, PROGRESSIVE FARMER (Dec. 9, 2019, 6:50 PM), https://www.dtnpf.com/agriculture/web/ag/crops/article/2019/12/10/states-report-another-year-dicamba [https://perma.cc/5JZS-W5HK].

181. *Id.*

182. Nat'l Fam. Farm Coal., 960 F.3d at 1124–25.

183. *Id.* at 1133 (referring to the requirements that registrants submit sufficient data, and that the re-registration would not cause unreasonable adverse effect on the environment).

order to vacate the registrations was effective immediately.[184] As such, all post-emergent versions of dicamba were then illegal to apply, even though dicamba-tolerant seeds were still freely available.[185] Much like in 2015 and 2016, the farmers of over 60 million acres of dicamba-tolerant soybeans and cotton had access to both dicamba-tolerant seeds and dicamba without the ability to legally apply it.[186]

The stunning ruling in *National Family Farm Coalition* led to perhaps an even more surprising reaction by many individual states. While some states instructed retailers and applicators to stop distributing and applying dicamba, the vast majority of states said that dicamba could continue to be both sold and applied.[187] While the legality of these states' responses is outside the scope of this Article, it is worth noting that dicamba applications likely continued after the Ninth Circuit's ruling.[188]

The pesticide companies' request to have the Ninth Circuit's ruling reheard en banc was denied.[189] Instead of filing for a writ of certiorari, the pesticide companies opted to seek re-registrations of post-emergent dicamba with the EPA.[190] The EPA granted five-year registrations to two of the three canceled dicamba versions.[191] In granting these registrations, the EPA added new restrictions to their labels including increased buffer range, a requirement to add pH buffering agents, and a federal cutoff date for applications.[192] While many of these labeling changes were first urged by the states, the EPA also announced that

184. Emily Unglesbee, *The Future of Dicamba*, PROGRESSIVE FARMER (July 14, 2020, 2:00 PM), https://www.dtnpf.com/agriculture/web/ag/crops/article/2020/07/14/dicamba-use-faces-trio-threats-weeds [https://perma.cc/L2XP-Q2Y6].

185. *Id.*

186. *Id.*; *see* Nat'l Fam. Farm Coal., 960 F.3d at 1126.

187. Emily Unglesbee, *The States of Dicamba*, PROGRESSIVE FARMER (June 8, 2020, 5:18 PM), https://www.dtnpf.com/agriculture/web/ag/crops/article/2020/06/08/states-enter-uncertain-legal-dicamba [https://perma.cc/P3P5-XS96].

188. *Id.*

189. Nat'l Fam. Farm Coal. v. U.S. Env't. Prot. Agency, No. 19-70115, 2020 U.S. App. LEXIS 26061, at *3 (9th Cir. Aug. 17, 2020).

190. Emily Unglesbee, *EPA Registers Dicamba Again*, PROGRESSIVE FARMER (Oct. 27, 2020, 5:44 PM) [hereinafter Unglesbee, *EPA Registers Dicamba Again*], https://www.dtnpf.com/agriculture/web/ag/crops/article/2020/10/27/epa-approves-three-dicamba-federal [https://perma.cc/5SMK-Y97Y].

191. *Id.* (granting registration to Bayer's XtendiMax and BASF's Engenia); *see* Nat'l Fam. Farm Coal., 960 F.3d at 1126.

192. Unglesbee, *EPA Registers Dicamba Again*, *supra* note 190.

states would no longer be permitted to use Section 24(c) of FIFRA to restrict the federal label.[193]

The EPA's decision to re-register post-emergent versions of dicamba was met with a litany of lawsuits.[194] The National Family Farm Coalition filed a petition claiming that the EPA's 2020 re-registration failed to fix any of the problems from prior dicamba registrations.[195] A set of plaintiffs in various petitions made the complete opposite argument, alleging that the EPA was too restrictive with the new dicamba labels.[196]

Ultimately, farmers in 2021 retained the ability to legally apply post-emergent versions of dicamba until the summer cutoff dates.[197] Despite the EPA's more restrictive labeling, reports of dicamba drift damage still appeared in high quantities across the country.[198] For example, by mid-July, Arkansas had received 310 complaints of herbicide injury with specific allegations of dicamba damage.[199] Farmers who used both dicamba-tolerant seeds and post-emergent dicamba voiced their frustrations with how confusing the EPA made the new labels.[200]

These new labels would not last for very long. In 2024, a federal court would once again vacate all post-emergent dicamba formulations.[201] In that case, the court noted that the EPA failed to provide a notice and comment period prior to approving the post-emergent versions of dicamba, which were required.[202] While the EPA permitted farmers to utilize existing dicamba stocks in 2024, post-

193. *Id.* (noting also that states could still use Section 24(c) to expand the federal label).

194. Unglesbee, *Dicamba Faces Legal Battlefield*, *supra* note 88.

195. Petition for Review at 2, Nat'l Fam. Farm Coal. v. U.S Env't Prot. Agency, No. 20-73750 (9th Cir. Dec. 21, 2020).

196. Complaint for Declaratory and Injunctive Relief at 3, Am. Soybean Ass'n v. U.S. Env't Prot. Agency, No. 20-03190 (D.D.C. Nov. 4, 2020); Petition for Review at 2, Am. Soybean Ass'n v. Regan, 77 F.4th 873 (D.C. Cir. 2023) (No. 20-1441).

197. Unglesbee, *Herbicide Injury*, *supra* note 27.

198. *Id.*

199. *Id.*

200. *Id.*

201. Ctr. for Biological Diversity v. U.S. Env't Prot. Agency, No. CV-20-00555, 2024 WL 455047, at *1 (D. Ariz. Feb. 6, 2024).

202. *Id.* at *15 ("[T]he EPA violated the statutory mandate in FIFRA for notice and comment for 'new use' registrations and failed to determine no additional data was necessary before issuing the 2020 unconditional registrations for OTT dicamba.").

emergent dicamba has not been approved for use during the 2025 growing season.[203] In short, the dicamba predicament is far from settled.

D. Why Sue the Manufacturers

1. Inability to Sue Applicators

In terms of case law, this Article is largely focused on two major suits filed against pesticide companies.[204] Attorneys unfamiliar with agriculture might be inclined to think that suits are being alleged against pesticide manufacturers because these are the defendants with the deepest pockets. While suits against the manufacturers are likely the most profitable, these suits are usually the only viable option for farmers seeking recourse for dicamba drift-related losses.[205]

Pursuing recovery against the farmer who applied the pesticides that drifted and caused damage has historically been challenging due to difficulties associated with evidence collection.[206] This recovery difficulty is oftentimes compounded in dicamba drift cases because the applicator followed both the label and regulations.[207] In cases where dicamba drifted but the applicator abided by all the rules, a negligence claim is generally unavailable.[208] Without negligence, a

203. Jason Jenkins, *Dicamba Do's and Don'ts for 2025*, PROGRESSIVE FARMER (Jan. 30, 2025), https://www.dtnpf.com/agriculture/web/ag/crops/article/2025/01/30/dicamba-dos-donts-2025 [https://perma.cc/WDQ4-SJEB].

204. *See In re* Dicamba Herbicides Litig., 359 F. Supp. 3d 711, 718–19 (E.D. Mo. 2019) (involving farmers from several states alleging numerous claims against Monsanto and BASF arising out of dicamba drift issues); Bader Farms, Inc. v. Monsanto Co., 431 F. Supp. 3d 1084, 1088 (E.D. Mo. 2019) (alleging conspiracy between Monsanto and BASF to create an "ecological disaster" that "increased demand for both defendants' new dicamba herbicide during the 2017 growing season"), *modified*, 39 F.4th 954 (8th Cir. 2022).

205. *See* Centner, *Damages from Pesticide Spray Drift Under Trespass Law*, *supra* note 37, at 3 (noting the difficulty of recovering damages when defendant did not breach a label instruction or regulatory provision).

206. Brown & Roessing, *supra* note 161, at 17–19 (illustrating the lengthy and intensive evidence collection process associated with any pesticide drift suit).

207. *See* Kristine Tidgren, *Dicamba Drift: What Are the Legal Remedies?*, FARM PROGRESS (Sept. 20, 2017), https://www.farmprogress.com/herbicide/dicamba-drift-what-are-legal-remedies [https://perma.cc/LV77-VHMP] ("Some scientists contend that dicamba is prone to vaporize . . . even when label instructions are carefully followed.").

208. *See* Mangrum v. Pigue, 198 S.W.3d 496, 501 (Ark. 2004) ("Although unfortunate, the fact that Mangrum's corn crop was damaged is not in and of itself evidence of negligence.").

plaintiff-farmer is left with potential claims of nuisance, trespass, or strict liability, though none of these options are ideal.[209]

Pesticide drift is a textbook example of a private nuisance.[210] In all 50 states, farmers are afforded some level of protection from nuisance suits via right-to-farm acts.[211] The policy rationale underlying right-to-farm acts is that a farmer's agricultural activities should not be considered a nuisance as the neighboring land uses change.[212]

Right-to-farm acts were passed in all 50 states as a response to urban sprawl, which put many longtime city dwellers next to noisy and smelly farmland.[213] New residents were often able to enjoin a farm's practices under existing nuisance law.[214] Right-to-farm laws served to prevent such lawsuits by barring nuisance suits against agricultural operations, oftentimes with very few exceptions.[215] The lack of exceptions to right-to-farm acts has led to interesting results in states like Mississippi, where a farmer's use of a cannon to scare away deer was recently shielded by the right-to-farm act.[216]

Without negligence or nuisance, many plaintiffs have resorted to trespass claims to recover drift-related losses.[217] The issue of whether pesticide drift constitutes a trespass requires an in-depth analysis of intangible invasions, which

209. Centner, *Damages from Pesticide Spray Drift Under Trespass Law*, *supra* note 37, at 3–4 ("These claims prove challenging for plaintiffs to establish.").

210. Hall v. Phillips, 436 N.W.2d 139, 145–46 (Neb. 1989) (ruling that whether or not a pesticide application was a nuisance is a question of fact).

211. Terence J. Centner, *Governments and Unconstitutional Takings: When Do Right-to-Farm Laws Go Too Far?*, 33 B.C. ENV'T AFFS. L. REV. 87, 87 (2006) [hereinafter Centner, *Governments and Unconstitutional Takings*].

212. Brown & Roessing, *supra* note 161, at 27.

213. *Id.*

214. *See, e.g.*, Spur Indus., Inc. v. Del E. Webb Dev. Co., 494 P.2d 700, 706 (Ariz. 1972) ("It is clear that as to the citizens of Sun City, the operation of Spur's feedlot was both a public and a private nuisance.").

215. *See, e.g.*, MISS. CODE ANN. § 95-3-29 (2024) ("proof that the agricultural operation . . . has existed for one (1) year or more is an *absolute defense* to the nuisance action" (emphasis added)); ARK. CODE ANN. § 2-4-107 (2024) (stating that an agricultural operation will not become a nuisance due to changes in locality as long as the farm has been in operation for longer than a year and the farm was not a nuisance at the time its operations began); TENN. CODE ANN. § 43-26-103 (2024) (creating a rebuttable presumption that a farm was not a nuisance).

216. Briggs v. Hughes, 316 So. 3d 193, 194, 197 (Miss. 2021) ("While we do understand Briggs's frustrations, we have to apply the Right to Farm Act as written.").

217. Centner, *Damages from Pesticide Spray Drift Under Trespass Law*, *supra* note 37, at 3–4.

is well beyond the scope of this Article.[218] In short, some states forbid the use of intangible invasions to support trespass claims whereas other states allow it.[219] Plaintiff-farmers in this latter group of states would need to show "substantial damages" in order to support a trespass claim.[220] Commentators have suggested that trespass law may have to change in favor of allowing intangible invasions in order for farmers to secure relief for drift-related damages.[221]

Twenty-seven jurisdictions have addressed whether or not strict liability is applicable for pesticide drift.[222] Of these jurisdictions, 19 have held that aerial applications are not an ultrahazardous activity, meaning that applicators in those jurisdictions cannot be held strictly liable for drift-related damages.[223] The other eight jurisdictions have held that aerial applications are an ultrahazardous activity, meaning that the applicator can be held strictly liable for drift-related damages.[224]

Notably, some of the jurisdictions that allow strict liability distinguish between aerial and ground applications, holding that ground applications are not deserving of strict liability.[225] Dicamba applications are not performed aerially but instead from the ground.[226] Due to dicamba's ground application method, the recovery of dicamba drift-related losses via strict liability is very unlikely.[227]

2. Lack of Insurance Reimbursement

Farmers whose crops have sustained dicamba drift-related damage cannot recover their losses through multi-peril crop insurance policies offered through the

218. *See id.* at 6 (examining three features of intangible invasions that hinder plaintiffs' success in pesticide drift suits).

219. Brown & Roessing, *supra* note 161, at 23.

220. Centner, *Damages from Pesticide Spray Drift Under Trespass Law*, *supra* note 37, at 10.

221. *Id.* at 7–8, 11.

222. TIFFANY DOWELL LASHMET & HANNES ZETZSCHE, NAT'L AGRIC. L. CTR., 50-STATE SURVEY: LANDOWNER LIABILITY FOR PESTICIDE DRIFT 2 (2020), https://nationalaglawcenter.org/wp-content/uploads/assets/articles/LashmetZetzsche-spraydriftsurvey.pdf [https://perma.cc/DJ4L-VZS3].

223. *Id.*

224. *Id.*

225. *Id.*

226. John Garr & Jerry Green, *What's Happening with Dicamba Drift?*, AGAIR UPDATE (Nov. 1, 2016), https://www.agairupdate.com/whats-happening-with-dicamba-drift/ [https://perma.cc/YE93-M8FV].

227. *See* LASHMET & ZETZSCHE, *supra* note 222, at 2.

USDA Risk Management Agency (RMA).[228] Policies offered through the USDA RMA are only intended to cover damage from natural occurrences.[229] The USDA RMA views herbicide drift as a management problem that is outside the scope of crop insurance coverage.[230]

Recovery through the applicator's liability insurance policy is only possible in very limited circumstances. First, the applicator needs to have purchased "spray endorsements," which is an add-on for liability insurance.[231] Based on the already low chances of being sued for pesticide drift, the actual need for applicators to purchase this insurance is questionable.[232]

In the event that the applicator did purchase spray endorsements, the insurance company will likely reimburse the harmed farmer in only one of three potential scenarios. If the applicator did not follow the label, the insurance company will not cover the resulting damages, as those damages are the consequence of violating federal law.[233] If the applicator did follow the label without any unforeseen issues arising, the insurance company will blame the pesticide's manufacturer and refuse to cover the damage.[234] If the applicator is applying the pesticide per the label but unforeseen circumstances cause the application to become off-label, the insurance company may cover the damage.[235] An example of this scenario could be a farmer applying pesticides when an unexpected gust of wind sends the pesticide into a neighboring field.[236]

228. Emily Unglesbee, *After the Burn*, PROGRESSIVE FARMER (Aug. 3, 2016, 3:07 PM) [hereinafter Unglesbee, *After the Burn*], https://www.dtnpf.com/agriculture/web/ag/news/business-inputs/article/2016/08/03/know-legal-options-herbicide-damage [https://perma.cc/PA9G-DKK4]; *see Multi-Peril*, RISK MGMT. AGENCY, U.S. DEP'T OF AGRIC. (Mar. 17, 2025, 1:56 PM), https://www.rma.usda.gov/taxonomy/term/274 [https://perma.cc/6J4T-GUAY].

229. Unglesbee, *After the Burn*, *supra* note 228.

230. *Id.*

231. Emily Unglesbee, *Dicamba: Who's Liable?*, GREAT AM. INS. GRP. (Oct. 23, 2017) [hereinafter Unglesbee, *Dicamba: Who's Liable?*], https://www.greatamericancrop.com/news-resources/article/2017/10/23/dicamba-whos-liable [https://perma.cc/3JKF-775G].

232. *See* discussion *supra* Section II.B.1; Unglesbee, *After the Burn*, *supra* note 228 ("Your neighbor's liability insurance could cover any damage caused by his herbicides drifting, but don't count on it . . . .").

233. Unglesbee, *Dicamba: Who's Liable?*, *supra* note 231.

234. *Id.*

235. *Id.* (noting that a claims investigation performed by the insurance company ultimately decides if the off-label aspect of an application was accidental or not).

236. *Id.*

E. Prominent Suits Against Pesticide Manufacturers

Lacking any other recourse, farmers have resorted to lawsuits filed against pesticide manufacturers to recover drift-related losses. The two most prominent dicamba drift cases have both been filed in the Southeastern Division of the Eastern District of Missouri.[237] The first of these cases, *Bader Farms, Inc. v. Monsanto Co.*, provides an illustrative example of how an individual, albeit massive, farming operation can recover drift-related losses from pesticide manufacturers.[238] The second of these cases, *In re Dicamba Herbicides Litigation*, is a multi-district litigation (MDL) brought by soybean farmers across the country who have suffered drift-related losses.[239]

Bader Farms's case was specifically excluded from the Master MDL Complaint because most of Bader Farms's claims pertained to damage reports in 2016, whereas the damages alleged in the MDL pertained to the 2017 growing season.[240] Additionally, Bader Farms would have been the only plaintiff alleging damage to peach trees.[241] Despite the differences in growing season and crops, both *Bader Farms* and *In re Dicamba Herbicides* generally involve the same claims against Monsanto and BASF.[242] To avoid repetitiveness, this Article only discusses these claims in reference to *Bader Farms*. The focus of the discussion of *In re Dicamba Herbicides* is on the alleged Lanham Act violations.

1. Claims of Bader Farms

Bader Farms sued Monsanto and BASF for extensive damage to Bader's peach orchards from 2015 to 2018.[243] Dividing the claims based on specific growing seasons, Monsanto first argued that it could not be held responsible for damage to Bader Farms's peach orchard during the 2015 and 2016 growing

237. *See* Bader Farms, Inc. v. Monsanto Co., 431 F. Supp. 3d 1084 (E.D. Mo. 2019), *modified*, 39 F.4th 954 (8th Cir. 2022); *In re* Dicamba Herbicides Litig., 359 F. Supp. 3d 711 (E.D. Mo. 2019).

238. *See* Bader Farms, Inc. v. Monsanto Co., 39 F.4th 954, 961, 974 (8th Cir. 2022) (upholding jury award in favor of Bader Farms against Monsanto and BASF for compensatory damages).

239. *In re* Dicamba Herbicides Litig., 359 F. Supp. 3d 711, 718 (E.D. Mo. 2019).

240. *In re* Dicamba Herbicides Litig., MDL No. 18-md-2820, 2018 U.S. Dist. LEXIS 172440, at *18 (E.D. Mo. Oct. 5, 2018).

241. *Id.*

242. *Bader Farms*, 431 F. Supp. 3d at 1093–99 (alleging joint venture, conspiracy, design defect, failure to warn, and negligent training); *In re Dicamba Herbicides Litig.*, 359 F. Supp. 3d at 717–18, 743 (alleging joint venture, conspiracy, design defect, failure to warn, and negligent training, among other claims).

243. *Bader Farms*, 431 F. Supp. 3d at 1089–90.

seasons.[244] Monsanto based this argument on the fact that Monsanto did not sell a post-emergent version of dicamba during the 2015 and 2016 growing seasons.[245] Monsanto then argued that it could not be held responsible for damage to Bader Farms's peach orchards during the 2017 and 2018 growing seasons.[246] Monsanto attempted to justify this position by stating that Bader could not prove the damage was caused specifically by Monsanto's post-emergent dicamba formulation.[247]

The district court rejected both of Monsanto's arguments.[248] The court found that Monsanto's potential link to the damage sustained by Bader Farms was not post-emergent dicamba but rather the dicamba-tolerant seeds.[249] Bader Farms argued that Monsanto knew farmers would apply pre-emergent formulations of dicamba to the dicamba-tolerant seeds in violation of the pre-emergent dicamba's label.[250] The district court asked, "why else would defendants sell dicamba-resistant seed if not to encourage the use of dicamba over the top?"[251] Monsanto and BASF faced potential liability for damage to Bader Farms's peach orchard through a litany of claims alleged in *Bader Farms*.[252] Bader Farms's claims against the companies were joint venture, conspiracy, design defect, failure to warn and negligent training.[253]

Bader Farms argued that Monsanto and BASF were jointly liable for all such claims under a joint venture liability theory.[254] The first element of a joint venture is "an express or implied agreement among members of the association."[255] The second element of a joint venture requires that the association's members carry out a "common purpose."[256] To satisfy the third element, a "community of pecuniary

244. *Id.*

245. *Id.*

246. *Id.* at 1090–91.

247. *Id.*

248. *Id.*

249. *Id.* at 1090–91 ("[T]he key to both the pre-XtendiMax and Engenia and post-XtendiMax and Engenia claims is not the herbicide, it's the Xtend seeds.").

250. *Id.* at 1090.

251. *Id.*

252. *Id.* at 1093–99.

253. *Id.*

254. *Id.* at 1093.

255. *Id.* (quoting Ritter v. BJC Barnes Jewish Christian Health Sys., 987 S.W.2d 377, 387 (Mo. Ct. App. 1999)).

256. *Id.* (quoting Ritter v. BJC Barnes Jewish Christian Health Sys., 987 S.W.2d 377, 387 (Mo. Ct. App. 1999)).

interest in that purpose" must exist.[257] Finally, the fourth element calls for "an 'equal voice' among all members in 'determining the direction of the enterprise.'"[258]

With respect to the first element, the court cited numerous agreements and documents created by the defendants throughout the dicamba commercialization process.[259] Some of these documents explicitly referred to the arrangement as a "joint venture."[260] The court pointed out that the defendants' agreements included reciprocal obligations and coordination of pre-commercialization steps.[261] These pre-commercialization steps often included the formation of working groups comprised of equal amounts of Monsanto and BASF employees.[262] These working groups created a question of fact as to joint control under the fourth element.[263]

The court spent the bulk of its analysis on the third element.[264] Specifically, the court seemed to cast doubt on whether or not the two defendants shared profits and losses in the alleged joint venture.[265] Bader Farms argued that the defendants' "value share payments" qualified as joint profits.[266] Under this aspect of the arrangement, BASF (the herbicide manufacturer) received a portion of the profits from Monsanto's seed sales.[267] The defendants argued BASF would have received a minimum payment even if Monsanto failed to sell any of the seeds.[268] In terms of losses, Bader Farms then pointed out that Monsanto and BASF equally divided dicamba residue testing costs.[269] Indicating that it was a "close call," the court ultimately left the question of whether or not Monsanto and BASF engaged in a joint venture to the jury.[270]

257. *Id.* (quoting Ritter v. BJC Barnes Jewish Christian Health Sys., 987 S.W.2d 377, 387 (Mo. Ct. App. 1999)).

258. *Id.* (quoting Ritter v. BJC Barnes Jewish Christian Health Sys., 987 S.W.2d 377, 387 (Mo. Ct. App. 1999)).

259. *Id.* at 1093–94.

260. *Id.* at 1094.

261. *Id.* at 1094–95.

262. *Id.* at 1095.

263. *Id.*

264. *See id.* at 1095–96.

265. *Id.* ("Such an arrangement may not be enough ultimately to show that the parties intended a joint venture.").

266. *Id.*

267. *Id.*

268. *Id.* at 1095.

269. *Id.* at 1096.

270. *Id.*

The court then analyzed the conspiracy claim alleged by Bader Farms.[271] To establish a conspiracy, Bader Farms needed to show five elements.[272] The first four elements are as follows: "(1) two or more persons; (2) with an unlawful objective; (3) after a meeting of the minds; (4) committed at least one act in furtherance of the conspiracy . . . ."[273] The fifth element requires that the plaintiff incurred damages because of the defendants' satisfaction of the first four elements.[274] Bader Farms satisfied the first element simply by suing both BASF and Monsanto.[275] If the second, third, and fourth elements could be satisfied, Bader Farms's drift-related losses would satisfy the fifth element.[276]

The second, third, and fourth elements provided one of the most interesting claims in this entire ordeal. Bader Farms alleged that Monsanto and BASF conspired to create an "ecological disaster."[277] Bader Farms claimed that Monsanto initiated this scheme by selling dicamba-tolerant seeds in 2015 and 2016 when the only available dicamba formulations were the more volatile pre-emergent versions.[278] Per the conspiracy, the farmers who planted dicamba-tolerant seeds in 2015 and 2016 would illegally apply the pre-emergent dicamba, which would ultimately drift to neighboring farms.[279] Any farmer who was not already planting dicamba-tolerant seeds would thus be forced to plant them as a defensive strategy against future drift.[280]

While a conspiracy to create an ecological disaster might seem like a plotline from an episode of Captain America, the facts certainly seem to favor the claim's validity. The court cited Bader Farms's evidence which pointed out that Monsanto's own representatives alerted others at Monsanto of the potential for widespread crop damage.[281] Bader Farms also cited the fact that BASF increased production of pre-emergent dicamba prior to the 2015 growing season.[282]

Though not cited in the opinion, Monsanto and BASF may have accomplished the alleged objective to force other farmers into defensive planting

271. *See id.* at 1096–97.
272. *Id.* at 1096.
273. *Id.*
274. *Id.*
275. *Id.* at 1097.
276. *See id*. at 1097, 1088.
277. *Id.* at 1098.
278. *Id.* at 1097.
279. *Id.*
280. *Id.*
281. *Id.*
282. *Id.*

strategies. As previously discussed, significant gaps exist in many states between the number of farmers who plant dicamba-tolerant seeds and the number of farmers who apply dicamba.[283] In certain states, over 20% of farmers plant dicamba-tolerant seeds but do not apply dicamba.[284] Despite this evidence not being discussed in the opinion, the court decided that the provided evidence was sufficient to create a question of fact for the conspiracy claim.[285]

Bader Farms also made a design defect claim against Monsanto and BASF.[286] Under Missouri law, there are four elements to a design defect claim.[287] First, the defendants must sell the product in the course of their business.[288] Second, at the time of sale the product must have been in a "defective condition" that made it "unreasonably dangerous when put to a reasonably anticipated use."[289] Third, the product had to have been "used in a manner reasonably anticipated."[290] Fourth, the plaintiff must have been injured as a direct result of the aforementioned defective condition.[291]

As applied here, the "defective" product was the dicamba-tolerant crop system (i.e., both the herbicide and the seed).[292] The crop system was "defective and unreasonably dangerous" because Monsanto and BASF failed to provide a safe herbicide.[293] While some drift damage, especially in 2015 and 2016, could be attributed to errors or wrongdoing by the applicator, Bader Farms alleged that defendants should have anticipated this result.[294] Put more broadly, Bader Farms argued that "there was no safe way to use the Xtend seeds with any dicamba

283. *See supra* text accompanying notes 167–175; Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*, *supra* note 74.

284. Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*, *supra* note 74.

285. Bader Farms, 431 F. Supp. 3d at 1098.

286. *Id.* at 1098.

287. *Id.*

288. *Id.* (quoting Menz v. New Holland N. Am., Inc., 507 F.3d 1107, 1114 (8th Cir. 2007)).

289. *Id.* (quoting Menz v. New Holland N. Am., Inc., 507 F.3d 1107, 1114 (8th Cir. 2007)).

290. *Id.* (quoting Menz v. New Holland N. Am., Inc., 507 F.3d 1107, 1114 (8th Cir. 2007)).

291. *Id.* (quoting Menz v. New Holland N. Am., Inc., 507 F.3d 1107, 1114 (8th Cir. 2007)).

292. *Id.* at 1098–99.

293. *Id.*

294. *Id.* at 1099.

product."[295] As with the other claims, the design defect claim survived the defendants' motion for summary judgment.[296]

Unsurprisingly, Bader Farms's failure to warn claim also survived defendants' motion for summary judgment.[297] In Missouri, the key issue in a failure to warn case is whether a product's accompanying information sufficiently informs the user of that product's dangers if misused.[298] Bader Farms argued that Monsanto and BASF "failed to warn of the risks of off-target damage to other farmers."[299] For the failure to warn claim to survive defendants' motion for summary judgment, Bader Farms also needed to establish proximate causation.[300] In other words, Bader Farms needed to demonstrate that, if Monsanto and BASF had warned farmers who used dicamba-tolerant crops of the product's dangers, these farmers would have heeded such a warning.[301] Though Missouri presumes that a warning will be heeded, Bader Farms needed to establish that the farmers who used dicamba-tolerant crops were not already aware of the associated dangers.[302] Since Bader Farms's evidence could establish this fact, Bader Farms's failure to warn claim survived the defendants' motion for summary judgment.[303]

Bader Farms also set forth a negligent training claim that defendants were unable to rebuff on summary judgment.[304] For a negligent training claim to succeed, a plaintiff must show four elements.[305] The first element requires the defendant to have a legal duty to use ordinary care to shield "the plaintiff against unreasonable risks of harm."[306] Second, there must be a breach of the defendant's duty.[307] Third, the plaintiff must show a proximate cause between said breach and

295. *Id.*
296. *Id.*
297. *Id.*
298. *Id.*
299. *Id.*
300. *Id.*
301. *Id.*
302. *Id.*
303. *Id.*
304. *Id.* at 1099–100.
305. *Id.* at 1099.
306. *Id.* (quoting Braxton v. DKMZ Trucking, Inc., No. 13-cv-1335, 2013 WL 6592771, at *3-4 (E.D. Mo. Dec. 16, 2013)).
307. *Id.* (quoting Braxton v. DKMZ Trucking, Inc., No. 13-cv-1335, 2013 WL 6592771, at *3-4 (E.D. Mo. Dec. 16, 2013)).

the injuries that resulted to the plaintiff.[308] Fourth, the damages must be "actual damages to the plaintiff's person or property."[309]

To establish its negligent training claim, Bader Farms argued that defendants' employees were not adequately trained.[310] Bader Farms cited specific examples of both Monsanto and BASF employees failing to take steps that could have prevented dicamba drift.[311] The court agreed with Bader Farms that these instances could be interpreted by the jury to mean that neither company's employees had been properly trained.[312] Therefore, the court denied the defendants' motion for summary judgment on the negligent training claim.[313]

Lastly, Bader Farms argued that the conduct of Monsanto and BASF leading up to this case warranted punitive damages.[314] Monsanto and BASF countered that their EPA approval and remedial actions such as training sessions and package label warnings should exclude an award of punitive damages.[315] Despite such evidence, the court wrote that Bader Farms's evidence indicated that "defendants were aware of the serious risk that their [dicamba-tolerant] Xtend system would inflict damage to [non-dicamba-tolerant] crops."[316] This led the court to ultimately allow the jury to consider an award of punitive damages.[317]

The order permitting these claims to proceed to the jury was filed on December 31, 2019.[318] Following trial, the court entered a judgment in favor of Bader Farms on February 28, 2020.[319] The jury determined that Bader Farms had proven either the negligent design or failure to warn claims against Monsanto with respect to the 2015 and 2016 growing seasons.[320] The jury also found that Bader Farms had proven one of those two claims against both Monsanto and BASF for

308. *Id.* (quoting Braxton v. DKMZ Trucking, Inc., No. 13-cv-1335, 2013 WL 6592771, at *3-4 (E.D. Mo. Dec. 16, 2013)).

309. *Id.* (quoting Braxton v. DKMZ Trucking, Inc., No. 13-cv-1335, 2013 WL 6592771, at *3-4 (E.D. Mo. Dec. 16, 2013)).

310. *Id.* at 1100.

311. *Id.*

312. *Id.*

313. *Id.*

314. *Id.*

315. *Id.*

316. *Id.*

317. *Id.*

318. *Id.*

319. Bader Farms, Inc. v. Monsanto Co., MDL No. 18-md-02820, 2020 WL 1503395 (E.D. Mo. Feb. 28, 2020), *modified*, 39 F.4th 954, 961, 974 (8th Cir. 2022).

320. *Id.* at *1.

the 2017 growing season.[321] Moreover, Monsanto and BASF were found to be acting in a joint venture and conspiracy.[322] Bader Farms was awarded $15 million in actual damages.[323]

The jury further assessed punitive damages of $250 million against Monsanto and BASF for their part in the dicamba drift issues experienced in 2015 and 2016.[324] The punitive damage award would later be reduced to $60 million by the district court, and then ultimately vacated by the Eighth Circuit.[325] The Eighth Circuit remanded the case for a new trial only on the issue of punitive damages, finding that BASF did not have equal control over whether to release dicamba-tolerant seed and thus was not engaged in a joint venture with Monsanto.[326] Because the joint venture claim failed, punitive damages must be assessed separately.[327] The Eight Circuit upheld the actual damages award against both parties, agreeing a civil conspiracy was established.[328] Bader Farms was also awarded $48,302.58 in legal fees.[329]

2. Claims of In re Dicamba Herbicides

Claims set forth in *In re Dicamba Herbicides* can be divided based on the MDL's two complaints.[330] The Crop Damage Class Action Master Complaint (Master Complaint) raised many of the same claims that Bader Farms did in its case.[331] Setting the repeated claims aside, the Master Complaint is distinct from Bader Farms's case due to its allegations of Lanham Act violations by Monsanto and BASF.[332] The Master Antitrust Action Complaint (Master Antitrust Complaint) raised three monopoly-related counts but was dismissed.[333]

321. *Id.*

322. *Id.* at *1, *3.

323. *Id.* at *1.

324. Bader Farms, Inc. v. Monsanto Co., 100 F.4th 944, 947 (8th Cir. 2024).

325. *Id.*

326. Bader Farms, Inc. v. Monsanto Co., 39 F.4th 954, 968–69 (8th Cir. 2022).

327. *Id.* at 973.

328. *Id.* at 970.

329. Bader Farms, Inc. v. Monsanto Co., MDL No. 18-md-02820, 2021 WL 1967441, at *1 (E.D. Mo. May 17, 2021).

330. Rollins, *Dicamba: Part One*, *supra* note 129.

331. *See* cases cited *supra* note 242.

332. *See* Rollins, *Dicamba: Part One*, *supra* note 129; *In re* Dicamba Herbicides Litig., 359 F. Supp. 3d 711, 720–21 (E.D. Mo. 2019).

333. Brigit Rollins, *The Deal with Dicamba: Part Six*, NAT'L AGRIC. L. CTR. (Mar. 25, 2020) [hereinafter Rollins, *Dicamba: Part Six*], https://nationalaglawcenter.org/the-deal-with-dicamba-part-six/ [https://perma.cc/SAG3-EVGQ].

At the outset, it should be noted that Bayer (which Monsanto is now a subsidiary of) created a dicamba settlement fund to resolve the MDL.[334] The settlement fund set aside $300 million for soybean farmers with documented yield loss from 2015 to 2020.[335] BASF did not take part in the final settlement.[336] Soybean farmers were able to file claims between December 30, 2020, and May 28, 2021.[337] A separate $100 million was set aside to cover non-soybean producers who experienced drift-related yield loss, which Bayer said it would handle on a case-by-case basis.[338]

i. Lanham Act Violations

To successfully allege a Lanham Act violation, a plaintiff must satisfy two elements.[339] The first element requires "an injury within the 'zone-of-interest,' that is, 'to a commercial interest in sales or business reputation.'"[340] The second element requires that this injury be "proximately caused by the defendant's misrepresentations."[341] As applied here, plaintiffs alleged that Monsanto and BASF's statements to farmers that dicamba-tolerant crop systems and post-emergent dicamba could be used without causing drift violated the Lanham Act.[342]

BASF was able to successfully dismiss Lanham Act allegations against itself due to a lack of personal jurisdiction.[343] Monsanto sought dismissal of plaintiffs'

334. Emily Unglesbee, *Dicamba Settlement Is a Go*, PROGRESSIVE FARMER (Dec. 17, 2020, 2:29 PM) [hereinafter Unglesbee, *Dicamba Settlement Is a Go*], https://www.dtnpf.com/agriculture/web/ag/crops/article/2020/12/17/300-million-dicamba-settlement-claim [https://perma.cc/7QP5-F8PM].

335. *Id.*

336. *Id.*

337. Emily Unglesbee, *Dicamba Settlement Deadline*, PROGRESSIVE FARMER (May 6, 2021, 11:02 AM), https://www.dtnpf.com/agriculture/web/ag/crops/article/2021/05/06/dicamba-injury-settlement-claims-due [https://perma.cc/3HGF-UNAV].

338. Emily Unglesbee, *Dicamba Injury Payments*, PROGRESSIVE FARMER (June 26, 2020, 3:36 PM) [hereinafter Unglesbee, *Dicamba Injury Payments*], https://www.dtnpf.com/agriculture/web/ag/news/article/2020/06/25/know-bayers-400-million-dicamba [https://perma.cc/V6PU-KSSW].

339. *In re* Dicamba Herbicides Litig., 359 F. Supp. 3d 711, 721 (E.D. Mo. 2019).

340. *Id.* (quoting Lexmark Int'l, Inc. v. Static Control Components, Inc., 572 U.S. 118, 134, 140 (2014)).

341. *Id.* (quoting Lexmark Int'l, Inc. v. Static Control Components, Inc., 572 U.S. 118, 134, 140 (2014)).

342. *Id.*

343. *Id.* at 723.

Lanham Act violations on four grounds.[344] Those four grounds were personal jurisdiction, lack of standing, the Lanham Act's zone-of-interest, and proximate causation.[345] Unlike BASF, Monsanto's objection to personal jurisdiction failed due to Monsanto's Missouri-based headquarters.[346]

Monsanto's other procedural objection, that of standing, related to a single plaintiff in the MDL who made a Lanham Act allegation pertaining to the 2016 growing season.[347] Monsanto argued that the criminal conduct of applicators who made post-emergent applications of pre-emergent dicamba in 2016 severed Monsanto's connection to that plaintiff's damages.[348] The court rejected Monsanto's argument, noting that "foreseeable intervening criminal conduct" does not "automatically" sever Monsanto's connection to the damage such that it is not fairly traceable to their actions under federal standing requirements.[349]

Monsanto next argued that the alleged injury to the plaintiffs' crops was not within the "zone-of-interest" as required for the Lanham Act's first element.[350] Specifically, Monsanto argued that, to state a claim under the Lanham Act, a plaintiff must be a competitor of the defendant.[351] While competitors can sue each other for Lanham Act violations, the Act allows for claims to be made between parties who have other relationships.[352] For a Lanham plaintiff's injury to fall within the zone of interest, the plaintiff needs to allege "an injury within the 'zone-of-interest,' . . . to a commercial interest in sales or business reputation . . . proximately caused by the defendant's misrepresentations."[353] Rejecting Monsanto's argument, the court ruled that "plaintiffs here are commercial actors, . . . and as such their allegations fall within the '[zone-of-interest]' required for standing under the Lanham Act."[354]

344. *Id.* at 720–23 (discussing defendants' objections regarding zone of interest, standing, proximate causation, and personal jurisdiction).

345. *Id.*

346. *Id.* at 723.

347. *Id.* at 721–22.

348. *Id.* at 722.

349. *Id.*

350. *Id.* at 721.

351. *Id.*

352. *Id.*

353. *Id.* (quoting Lexmark Int'l Inc. v. Static Control Components, Inc., 572 U.S. 118, 134, 140 (2014)).

354. *Id.*

Monsanto also argued that its conduct was too remote from plaintiffs' damages to establish proximate causation.[355] Monsanto attempted to depict the plaintiffs as "'indirect' victims of the allegedly false advertising."[356] Following this logic, Monsanto argued that the direct victims were the farmers who purchased dicamba-tolerant seeds.[357] As with the other objections raised by Monsanto, the court rejected Monsanto's view.[358] The court noted that "there may be an intervening step of consumer deception, as a plaintiff can be directly injured by a misrepresentation even in a case in which a third party . . . relied on it."[359] Here, plaintiffs "alleged commercial injury because Monsanto's misrepresentations caused third parties to use dicamba that destroyed plaintiffs' crop, so there were no soybeans to sell."[360] Therefore, the court ruled that plaintiffs properly pled proximate causation.[361]

By rejecting these objections, the court on February 6, 2019, permitted continued litigation between plaintiffs and Monsanto regarding the Lanham Act claims.[362] Given that BASF was able to evade the Lanham Act allegations due to a lack of personal jurisdiction, Bayer's decision to settle essentially indicates the end of *In re Dicamba Herbicides.*[363]

ii. The Master Antitrust Complaint

The MDL's three antitrust counts are addressed in a March 2019 unpublished opinion by the court.[364] The plaintiffs allege that Monsanto and BASF violated Section 2 of the Sherman Act by (1) acting in furtherance of a monopoly, (2) attempting to monopolize, and (3) conspiring to monopolize.[365] Plaintiffs pursuing these claims purchased dicamba-tolerant seeds as a defensive strategy against

355. *Id.* at 722.

356. *Id.*

357. *Id.*

358. *Id.*

359. *Id.* (quoting *In re* Syngenta AG MIR 162 Corn Litig., 131 F. Supp. 3d 1177, 1221 (D. Kan. 2015)).

360. *Id.* ("In other words, it is a commercial interest in sales because plaintiff lost all its sales.").

361. *Id.*

362. *Id.* at 723.

363. *See id.* at 724; Unglesbee, *Dicamba Injury Payments*, *supra* note 338.

364. *In re* Dicamba Herbicides Litig., MDL No. 2820, 2019 WL 1160817, at *1 (E.D. Mo. Mar. 13, 2019).

365. *Id.*

drift.[366] Plaintiffs argue that Monsanto increased demand for its dicamba-tolerant seeds through customers like them and received monopolistic profits as a result.[367]

Monsanto claimed that the Master Antitrust Complaint should be dismissed because the plaintiffs lacked standing.[368] Monsanto argued that plaintiffs lacked standing to bring antitrust claims since plaintiffs were not direct purchasers of Monsanto's seeds.[369] The direct purchaser requirement exists because "where one or more intermediaries exist between defendant and plaintiff, the possibility arises for (1) multiple lawsuits and (2) complex and uncertain proof of damages."[370]

Though plaintiffs acknowledged that their seed purchases were not through Monsanto, plaintiffs argued that the "necessary purchase connection" existed through Monsanto's licensing agreement.[371] In order to use the dicamba-tolerant trait, Monsanto required plaintiffs to enter the Monsanto Technology/Stewardship Agreement (MTSA).[372] The MTSA required plaintiffs to pay royalties and technology fees to Monsanto.[373] Plaintiffs argued that the MTSA made the plaintiffs "direct purchasers" of the dicamba-tolerant trait.[374]

Noting that Monsanto never actually imposed any of these royalties or technology fees, the court rejected the plaintiffs' argument regarding the MTSA.[375] Using a fallback argument, plaintiffs cited an opinion from the Eighth Circuit Court of Appeals which noted that a similar transaction with Monsanto was "'functionally indistinguishable' from a direct purchase.'"[376] The plaintiffs describe the case as creating an agency exception when plaintiffs buy seed from a third party but pay a technology fee to Monsanto.[377] The court rejected plaintiffs' argument here as well.[378] The court went on to state that, even if plaintiffs' argument was accepted, the lack of imposed fees through the MTSA is detrimental

366. *Id.*
367. *Id.*
368. *Id.* at *2.
369. *Id.*
370. *Id.*
371. *Id.*
372. *Id.*
373. *Id.*
374. *Id.*
375. *Id.* at *3.
376. *Id.* (quoting Blades v. Monsanto Co., 400 F.3d 562, 568 n.4 (8th Cir. 2005)).
377. *Id.*
378. *Id.* ("[C]ourts have uniformly declined to recognize exceptions to the direct purchaser rule where the plaintiff did not actually transact its purchase with the alleged monopolistic supplier.").

to the plaintiffs' case.[379] As a result, the court dismissed the Master Antitrust Complaint without prejudice.[380] Barring a change in jurisprudence regarding the direct purchaser rule, there is virtually no chance for a similar lawsuit to succeed as large crop companies rarely sell seeds directly to farmers.[381]

III. ANALYSIS

American agriculture faces a major dilemma with dicamba drift that exposes many shortcomings in a variety of different aspects of the law. Millions of acres of crops have reportedly been damaged by dicamba drift.[382] Farmers experiencing yield losses from dicamba drift have secured hundreds of millions of dollars in judgments and settlements related to the herbicide.[383] Still, the farmers who were able to recoup their losses through those means had to undergo years of costly and time-consuming litigation.[384] Not all farmers can afford to take the largest agricultural companies in the world to court.

Farmers' claims relating to 2021 and subsequent growing seasons, or for damage to non-soybeans for any year, did not qualify for the settlement in *In re Dicamba Herbicides*.[385] As discussed above, crop insurance rarely reimburses drift-related losses and private suits against the applicator are next to impossible to win.[386] Thus, farmers who did not qualify for the settlement likely absorbed the financial loss.[387]

379. *Id.*

380. *Id.* at 3–4.

381. Rollins, *Dicamba: Part Six*, *supra* note 333 ("It is common practice for farmers to purchase seeds through a third party such as an independent seed dealer, rather than directly from Monsanto.").

382. Nat'l Fam. Farm Coal. v. U.S. Env't Prot. Agency, 960 F.3d 1120, 1138 (9th Cir. 2020).

383. *See* Bader Farms, Inc. v. Monsanto Co., MDL No. 18-md-02820, 2020 WL 1503395, at *1 (E.D. Mo. Feb. 28, 2020) (entering judgment of $15 million in actual damages), *aff'd in relevant part*, 39 F.4th 954 (8th Cir. 2022); Unglesbee, *Dicamba Injury Payments*, *supra* note 338 (discussing the $300 million settlement for soybean farmers who experienced losses due to dicamba drift).

384. Bader Farms, Inc. v. Monsanto Co., MDL No. 18-md-2820, 2020 WL 6939364, at *42 (E.D. Mo. Nov. 25, 2020) ("This case has straddled four years, a multi-district litigation, a trial that lasted over three weeks, and post-trial briefing in which memoranda alone totaled hundreds of pages."), *modified*, 39 F.4th 954 (8th Cir. 2022).

385. Unglesbee, *Dicamba Settlement Is a Go*, *supra* note 334 (noting that only claims pertaining to soybean damage occurring from 2015 to 2020 qualified for a settlement).

386. *See* discussion *supra* Section II.D.

387. *See* Unglesbee, *Dicamba: Who's Liable?*, *supra* note 231.

Given the already controversial nature of pesticides, and the fact that dicamba drift is still happening, dicamba drift remains a live issue.[388] Many potential solutions have been proposed. As will be demonstrated, these solutions ignore Congress' intent behind FIFRA to balance the economic, environmental, and consumer health needs of the marketplace.[389] While FIFRA is not perfect, its cost-benefit analysis is highly practical, both in terms of considering a pesticide's merits for registration and in terms of considering proposals to amend the current regulatory scheme governing pesticides. As mentioned previously, a balancing test, based on FIFRA's cost-benefit analysis, will be used to grade proposals to determine their merits in terms of agricultural efficiency, environmental health, and consumer health.[390]

This Article is not intended to serve as a comprehensive list of all proposed solutions. Instead, this Article provides a sample of proposals gathered from a diverse range of outlets. This Part will demonstrate that these proposals yield a negative return on the balancing test that is set forth under FIFRA's own terms.

A. Global Transition to Organic Agriculture

After so much discussion of herbicide-tolerant crops, the most tempting argument might be to convert all cropland to organic and abandon GM crops entirely. After all, glyphosate has received even more negative press than dicamba.[391]

A global conversion to organic agriculture has in fact been proposed and published.[392] This publication argues that a global conversion to organic agriculture is possible, but should only be performed if certain prerequisites are satisfied.[393] The first prerequisite is the "reduction[] of livestock feed from arable land . . . with corresponding reductions in animal numbers and products supply (and thus human consumption)."[394] In other words, the authors of the proposal are

388. Unglesbee, *Herbicide Injury*, *supra* note 27.

389. *See* 7 U.S.C. § 136(bb) (requiring pesticide approval to consider "the economic, social, and environmental costs and benefits" as well as human health risks).

390. *See id.*

391. *See* Maryclaire Dale, *Bayer Fights String of Roundup Trial Losses Including $2.25B Verdict in Philadelphia*, THE ASSOCIATED PRESS (Feb. 14, 2024, 10:53 AM), https://apnews.com/article/weed-killer-roundup-philadelphia-verdict-cancer-6c777d7fd4e7c38ec8fe28a6f1566d24 [https://perma.cc/LB6G-M66H].

392. Muller et al., *supra* note 40, at 1.

393. *Id.* at 6 ("Solely converting to 100% organic production within an agricultural production system that should provide the same quantities and composition of outputs as in the reference scenario is not viable and would lead to increased agricultural land use.").

394. *Id.* at 2.

calling for an international move to vegetarianism.[395] The second prerequisite is "reductions of food wastage."[396]

The environmental effects from a global conversion to organic agriculture can be surprising to individuals not familiar with farming. The land required for farming would necessarily increase because of the reduced yields of organic crops, thereby causing deforestation.[397] Consequently, greenhouse gas emissions might actually increase under the plan as farmers would need to manage larger amounts of land.[398] A 100% conversion to organic agriculture would also increase soil erosion by 10–30%.[399] If a global conversion to organic agriculture occurred without satisfying the aforementioned prerequisites, the required amount of land would be incredibly high.[400]

The proposed 100% conversion to organic agriculture on a global scale received significant criticism.[401] While conceding that the proposal's two prerequisites could have positive effects, critics note that "global consumption of animal products is going up not down" and that "the food waste issue is incredibly complex."[402] Additionally, the proposal's termination of animal agriculture ignores the fact that most organic cropland relies on animal manure as fertilizer.[403] Without livestock being produced for human consumption, animal manure as a commodity would almost certainly disappear.

The proposed switch to organic agriculture also ignores the benefits that organic farmers receive from conventional farmers. While organic farmers use non-synthetic pesticides (including copper- and sulfur-based compounds), these products are not nearly as effective as synthetic pesticides at eliminating pests and

395. Mark Lynas, *Organic Farming Can Feed the World – Until You Read the Small Print*, ALL. FOR SCI. (Nov. 22, 2017), https://allianceforscience.org/blog/2017/11/organic-farming-can-feed-the-world-until-you-read-the-small-print/ [https://perma.cc/2T6D-2KS7].

396. Muller et al., *supra* note 40, at 2.

397. *Id.* at 3.

398. *Id.* at 5–6.

399. *Id.* at 5.

400. *Id.* at 4 ("[C]onversion to 100% organic production without complementary measures would lead to huge land demand increases.").

401. Lynas, *supra* note 395 ("[W]hat the researchers actually show is that 100[%] conversion to organic can only feed the world if two frankly impossible other conditions are met.").

402. *Id.*

403. *Id.*

crop diseases.[404] Organic agriculture benefits from synthetic pesticides used on neighboring farms which act to prevent major accumulations of pests or crop diseases that could otherwise overwhelm an entirely organic world.[405] In short, the proposal to undergo a 100% conversion to organic agriculture ignores the benefits that organic agriculture receives from other parts of the industry.[406] By cutting out entire subsets of agriculture, organic agriculture is setting itself up for under-fertilized cropland riddled with disease and pests.[407]

To be clear, these issues are inherent with any proposal to convert agriculture to an entirely organic means of production and not just any one article. In rejecting a different organic conversion proposal, one commentator noted that its flawed assumptions were the "unfortunate result of [a] lack of critical thinking."[408] Another organic conversion proposal was rejected due to its misinterpreted data and erroneous calculations.[409]

Before grading the proposal for a 100% conversion to organic agriculture, it is important to clear up another misconception of organic foods—organic foods are not healthier.[410] Dan Glickman, the Secretary of Agriculture under President Clinton, oversaw the implementation of USDA Certified Organic labeling.[411]

404. *Id.*; TIM MCCOY ET AL., VA. COOP. EXTENSION, VA. STATE UNIV., ORGANIC VS. CONVENTIONAL (SYNTHETIC) PESTICIDES: ADVANTAGES AND DISADVANTAGES 2 (2020), https://www.pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/ENTO/ento-384/ENTO-384.pdf [https://perma.cc/2WTV-Q5CW].

405. Lynas, *supra* note 395 ("[N]one of the published studies account for the halo effect of existing synthetic pesticide use, which helps protect neighboring organic farms from severe pest outbreaks by area-wide suppression of pest populations. The same goes for diseases.").

406. *Id.*

407. *Id.*

408. David J. Connor, *Organically Grown Crops Do Not a Cropping System Make and nor Can Organic Agriculture Nearly Feed the World*, 144 FIELD CROPS RSCH. 145, 146 (2013).

409. D.J. Connor, *Organic Agriculture Cannot Feed the World*, 106 FIELD CROPS RSCH. 187, 187 (2008) ("The conclusions of the study are, however, invalid because data are misinterpreted and calculations accordingly are erroneous.").

410. Alan D. Dangour et al., *Nutritional Quality of Organic Foods: A Systematic Review*, 90 AM. J. CLINICAL NUTRITION 680, 684 (2009) ("One broad conclusion to draw from this review is that there is no evidence to support the selection of organically produced foodstuffs over conventionally produced foodstuffs to increase the intake of specific nutrients or nutritionally relevant substances."); Phil Harvey & Matthew Rees, *The Failed Promise of Organic Foods*, REALCLEAR MKTS. (Apr. 19, 2021), https://www.realclearmarkets.com/articles/2021/04/19/the_failed_promise_of_organic_foods_773246.html [https://perma.cc/26N3-LK2P] (noting that 45% of United States adults believe organic foods are healthier than conventional foods).

411. Harvey & Rees, *supra* note 410.

Glickman stated that the label was not "a statement about food safety" nor "a value judgment about nutrition or quality."[412] In short, the health benefits from consuming organic products as opposed to conventional products are next to zero.[413]

Proponents of organic food often cite the lack of pesticides used in the production of their food as a reason for their preference, but organic foods do receive pesticide applications, and GM crops actually reduce pesticide use.[414] Moreover, organic foods can have pesticide residue even when the organic foods hit the store shelves.[415] Certain pesticides used in organic food production are actually suspected to be worse for consumers than the synthetic pesticides used in conventional and GM food production.[416]

The proposal to undergo a 100% conversion to organic agriculture proves easy to grade on this Article's balancing test. With respect to the first variable of agriculture efficiency, even proponents of the proposal concede that organic agriculture is relatively inefficient.[417] In terms of environmental health, once the

412. *Id.* (noting that the purpose of USDA Certified Organic was to regulate a disjointed organic food market).

413. Michelle Brandt, *Little Evidence of Health Benefits from Organic Foods, Study Finds*, STANFORD MED. (Sept. 3, 2012), https://med.stanford.edu/news/all-news/2012/09/little-evidence-of-health-benefits-from-organic-foods-study-finds.html [https://perma.cc/EBJ3-N4AR] (noting that a review of 237 research papers "found little significant difference in health benefits between organic and conventional foods.").

414. Dennis L. Patton, *Organic Does Not Mean Pesticide-Free*, KAN. STATE RSCH. & EXTENSION JOHNSON CNTY., KAN. STATE UNIV. (Oct. 10, 2024) [hereinafter Patton, *Organic Does Not Mean Pesticide-Free*], https://www.johnson.k-state.edu/lawn-garden/agent-articles/environment/organic-does-not-mean-pesticide-free.html [https://perma.cc/LL9K-A5F2] ("[I]n some cases, organically produced crops could have been sprayed many times and many pesticides could have been used on them before they reach the store shelf."); *see, e.g.*, Gage Patton, Note, *Innovate Ag Tech, Not Ag Tort: Why Legislative and Judicial Policies Favoring Tech Innovation and Big Ag's IP Rights in GMOs Will Benefit Agricultural Production and Food Security*, 30 J. INTELL. PROP. L. 236, 238 (2022) [hereinafter Patton, *Innovate Ag Tech, Not Ag Tort*] ("Specifically, GMOs contribute to lower food prices worldwide, work to ensure a more sustainable global food supply, *facilitate the reduction of pesticide use on farms*, reduce food waste after harvest, *preserve soil health*, and reduce energy expenditures in agricultural operations." (emphasis added)).

415. Patton, *Organic Does Not Mean Pesticide-Free*, *supra* note 414.

416. Christie Wilcox, *Mythbusting 101: Organic Farming > Conventional Agriculture*, SCI. AM. (July 18, 2011), https://blogs.scientificamerican.com/science-sushi/httpblogsscientificamericancomscience-sushi20110718mythbusting-101-organic-farming-conventional-agriculture/ [https://perma.cc/H9BC-RJZG] ("Not only are organic pesticides not safe, they might actually be worse than the ones used by the conventional agriculture industry.").

417. Muller et al., *supra* note 40, at 2 ("[O]rganic systems produce lower yields.").

assumptions of said proposals are realistically considered and rejected, the hazards posed to the environment by an organic conversion become clear.[418] Lastly, under the third variable, the health benefits offered by organic crops are trivial at best.[419] In sum, the agricultural efficiency and environmental health variables are negative under a 100% organic conversion proposal. The consumer health variable is likely zero. As such, the balancing test yields a negative result, indicating the current state of affairs is superior.

B. De-Registering Post-Emergent Dicamba

Given the problems associated with an all-organic world, as well as the issues associated with dicamba, a more balanced approach is desirable. Perhaps the narrowest possible action would be to ban post-emergent applications of dicamba once and for all, either through the EPA firmly opposing future registration attempts or possibly congressional action. The ban on post-emergent applications of dicamba was effectively accomplished by the Ninth Circuit's vacatur of post-emergent dicamba in *National Family Farm Coalition* and the United States District Court for the District of Arizona's vacatur in *Center for Biological Diversity*.[420] Granted, the dicamba-less period caused by the Ninth Circuit was short-lived due to the EPA's re-registration of other versions of post-emergent dicamba.[421] The effect of the first growing season without post-emergent dicamba since 2016 will be seen throughout the summer of 2025.[422]

The appeal of a ban on post-emergent applications of dicamba is fairly obvious. Before post-emergent applications of dicamba became commonplace, there was very little reported dicamba drift.[423] Once post-emergent applications of

418. Lynas, *supra* note 395 (noting the potential for increases in plant pests and diseases under an all-organic agricultural production scheme).

419. Brandt, *supra* note 413.

420. Nat'l Fam. Farm Coal. v. U.S. Env't Prot. Agency, 960 F.3d 1120, 1125 (9th Cir. 2020); Ctr. for Biological Diversity v. U.S. Env't Prot. Agency, No. CV-20-00555, 2024 WL 455047, at *1 (D. Ariz. Feb. 6, 2024).

421. *See* Unglesbee, *Dicamba Faces Legal Battlefield*, *supra* note 88.

422. *See* Tom J. Bechman, *How You Can and Can't Use Dicamba in 2025*, FARM PROGRESS (Jan. 3, 2025), https://www.farmprogress.com/crop-protection/how-you-can-and-can-t-use-dicamba-in-2025 [https://perma.cc/YT42-8JB8]; Jason Jenkins, *OTT Dicamba Labels Unlikely for 2025*, PROGRESSIVE FARMER (Sept. 23, 2024, 12:00 PM) [hereinafter Jenkins, *OTT Dicamba Labels Unlikely for 2025*], https://www.dtnpf.com/agriculture/web/ag/crops/article/2024/09/23/regulatory-realities-likely-keep-top [https://perma.cc/4J2A-XXSA].

423. Rollins, *Dicamba: Part One*, *supra* note 129 ("By applying dicamba prior to planting, damage that could occur to crops due to the pesticide's volatility was prevented because most sensitive species had not yet emerged.").

dicamba were performed on a national scale, alleged dicamba drift numbers increased drastically.[424] A reversion to the pre-2017 state of affairs would seem to fix this issue without causing too much heartache for the rest of the world.

This Article anticipates that a ban on post-emergent dicamba applications will result in one of two distinct outcomes. The first scenario would be a replay of the 2015 and 2016 growing seasons (i.e., seasons in which there were dicamba-tolerant seeds on the market without any approved post-emergent versions of dicamba).[425] A ban on post-emergent dicamba would leave farmers once again with available dicamba-tolerant seeds, but no corresponding post-emergent dicamba formulations.[426] Except this time, far more farmers would already have incorporated dicamba-tolerant seeds and post-emergent dicamba applications into their operations.[427]

As such, a ban on post-emergent dicamba applications would require farmers to make a transition from their current habits to new schedules.[428] Farmers are disincentivized from making this transition for two reasons. First, the threat of glyphosate-resistant weeds has made dicamba the primary tool to maintain high yields.[429] Second, as evidenced by the 2015 and 2016 growing seasons, illegal use of pre-emergent dicamba formulations in post-emergent applications is nearly impossible to stop.[430] Note that farmers maintain their own pesticide records, which could potentially reduce the likelihood of catching illegal applications as well.[431]

Thus, in the first possible outcome of a ban on post-emergent dicamba applications, many farmers would likely use pre-emergent dicamba for post-

424. Bradley, *A Final Report on Dicamba*, *supra* note 21.

425. *See* Smith, *Year-Long Drama*, *supra* note 16.

426. Jenkins, *OTT Dicamba Labels Unlikely for 2025*, *supra* note 422.

427. *See* Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*, *supra* note 74 (illustrating the high percentage of farmers who have adopted dicamba-tolerant soybeans and post-emergent dicamba).

428. Jenkins, *OTT Dicamba Labels Unlikely for 2025*, *supra* note 422.

429. Wechsler et al., *Use of Genetically Engineered Dicamba-Tolerant Soybean Seeds*, *supra* note 74.

430. Jenkins, *OTT Dicamba Labels Unlikely for 2025*, *supra* note 422; Pam Smith, *Off-Target Trauma*, PROGRESSIVE FARMER (Aug. 3, 2016, 2:57 PM), https://www.dtnpf.com/agriculture/web/ag/crops/article/2016/08/03/states-dig-dicamba-claims [https://perma.cc/CA32-XTTN] (reporting that some farmers are willing to pay associated fines with illegal applications of dicamba).

431. *See* Jenkins, *OTT Dicamba Labels Unlikely for 2025*, *supra* note 422; 7 U.S.C. § 136j(a)(2)(B).

emergent applications.[432] This outcome is undesirable because pre-emergent dicamba is significantly more volatile than post-emergent dicamba, meaning that drift numbers would likely increase even more.[433] Thus, a ban on post-emergent dicamba applications would reduce agricultural efficiency by increasing drift and consequently reducing neighboring yields. The surrounding environment would likely suffer due to an increase in drift, causing damage to nearby trees among other plants.

The second possible outcome of a ban on post-emergent dicamba applications involves the assumption that farmers do indeed follow the law. Under this assumption, farmers of one of America's largest cash crops lose their most effective tool against an increasingly prevalent weed (i.e., glyphosate-resistant pigweed).[434] Agricultural efficiency would deteriorate significantly as a result. The environment might also suffer as farmers use more land to plant more crops to achieve similar total harvests.

Regardless of which outcome ensues from a hypothetical ban on post-emergent dicamba applications, the balancing test yields the same result. Whether it be from an increase in drift numbers or an increase in glyphosate-resistant weeds, agricultural efficiency would decrease. Either of those increases likely harm the environment as well. Consumer health is probably unaffected in either scenario. Therefore, a ban on post-emergent dicamba applications results in a negative effect on social welfare.

As an aside, it should be noted that a ban on dicamba-tolerant soybean seeds—and not just the herbicide—is also impractical. Monsanto inserted the dicamba-tolerant gene into all of its soybean varieties in 2016.[435] A ban on dicamba-tolerant seeds would mean that many United States soybean farmers, regardless of their views on post-emergent dicamba, would be left without any of Bayer's (i.e., post-merger Monsanto) Xtend seeds to plant.[436]

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432. Hettinger, *supra* note 166 ("[T]he EPA said it would expect the damage to continue, even if they did not approve the new dicamba formulations because of continued illegal spraying.").

433. *Id.* ("[M]ore than half of dicamba applications in 2018 were of older versions of dicamba that are more likely to volatilize . . . and illegal to spray.").

434. *See* Ryan McGeeney, *As Options Dwindle, New Resistance Emerges in Pigweed*, DIV. OF AGRIC. RSCH. & EXTENSION, UNIV. OF ARK. (Feb. 18, 2021), https://aaes.uada.edu/news/pigweed/ [https://perma.cc/7WYH-87C6].

435. Flitter, *supra* note 173.

436. *Id.* ("[T]he only alternative would have been 'to not sell a single soybean in the United States' that year, Monsanto Vice President of Global Strategy Scott Partridge told Reuters in an interview."). As of April 2025, Bayer, through their Roundup Ready Xtend

C. Remedy for Drift Damages via Trespass

Given the demonstrated cons of an all-organic system and of a ban on post-emergent dicamba applications, proposals have become more creative. As discussed previously, a farmer's right to recover damages against the applicator is hindered by a litany of legal roadblocks.[437] A lawsuit against an applicator whose pesticides drifted and caused damage could be successful in a jurisdiction that has adopted certain views on trespass theory.[438] At least one commentator has suggested that more jurisdictions adopt this view of trespass in order to provide some form of recovery for farmers who have experienced losses due to drift.[439]

This proposal has several benefits. In contrast to the complex litigation represented by *In re Dicamba Herbicides*, a trespass suit against an individual farmer is a routine legal affair.[440] Consequently, if more drift suits take place, more farmers would likely consider less volatile pesticides.[441] With this market pressure, pesticide manufacturers would be less likely to release volatile pesticides into the market.[442]

website, lists one soybean variety and two cotton varieties, all of which have Bayer's "Roundup Ready Xtend Technology," which is their trade name for dicamba-tolerance along with other herbicide tolerances. *Soybeans*, ROUNDUP READY XTEND TECH. (Apr. 7, 2025, 8:28 PM), https://www.roundupreadyxtend.com/products/Pages/soybeans.aspx [https://perma.cc/B5B9-V887]; *Bollgard 3 Thryvon Cotton with XtendFlex Technology*, ROUNDUP READY XTEND TECH. (Apr. 7, 2025, 8:30 PM), https://www.roundupreadyxtend.com/products/Pages/bollgard3-thryvon.aspx [https://perma.cc/PG9Q-3X86]; *Bollgard 3 XtendFlex Cotton*, ROUNDUP READY XTEND TECH. (Apr. 7, 2025, 8:31 PM), https://www.roundupreadyxtend.com/products/Pages/bollgard3-xtendflex.aspx [https://perma.cc/732U-PDDY].

437. *See* discussion *supra* Section II.D.1. The suggestion to broaden the use of trespass is likely inspired in part by the use of trespass for cases involving cross-pollination of GM seeds with a neighboring farmer utilizing organic farming techniques. *See* Patton, *Innovate Ag Tech, Not Ag Tort*, *supra* note 414, at 258–59.

438. Centner, *Damages from Pesticide Spray Drift Under Trespass Law*, *supra* note 37, at 13–14.

439. *Id.* at 17 ("State law may be expected to evolve so that plaintiffs suffering damages from an unreasonable invasion of an intangible substance can secure relief under trespass law.").

440. The difficulty of taking part in an MDL likely disincentivized the majority of affected farmers from participating. *Compare* Bradley, *A Final Report on Dicamba*, *supra* note 21 (showing 2,708 reports of dicamba drift damage in 2017 alone), *with In re* Dicamba Herbicides Litig., MDL No. 2820, 2021 U.S. Dist. LEXIS 112819, at *1 (J.P.M.L. June 10, 2021) (showing only 37 plaintiffs in the MDL).

441. *See* Brown & Roessing, *supra* note 161, at 43–44 (making an analogous argument in the context of nuisance suits).

442. *See id.* at 44.

This Article does not discount this proposal's effectiveness on mitigating the drift issue; however, this Article serves to draw attention to the potential for unintended consequences. Specifically, plaintiffs could use such a change in trespass jurisprudence as a workaround to right-to-farm act-related defenses.[443] In other words, under this proposal, a plaintiff could sue a farmer under trespass instead of nuisance and thereby defeat the intent of right-to-farm legislation. While that result seems socially acceptable when the plaintiff is another farmer who suffered losses because of the defendant's dicamba drift, it seems questionable in other scenarios.

For example, consider a real estate developer who wants to enjoin the neighboring swine farm from further operations so that his subdivision can increase in value. That real estate developer could use the proposed changes in trespass jurisprudence to accomplish that goal. This hypothetical is roughly the same fact pattern as *Spur Industries v. Del E. Webb Development Co*.[444] By allowing trespass to bypass traditional requirements and be used as a replacement for nuisance, plaintiffs of all types could override the very purpose of right-to-farm acts.[445] If this loophole is taken to its fullest possible extent, the result could be devastating for farmers across the country.

In sum, the balancing test for the proposal of a trespass-based remedy yields a result that is either close to or below zero, depending on an individual's preferences. Agricultural efficiency, though positive in the short-run, could ultimately become negative in the long-run. The environmental effect is likely positive, simply due to the reduction in drift. Consumer health is unaffected.

D. Including the ESA in Pesticide Registration

Another common proposal is a call to apply requirements set forth in the ESA to the pesticide registration process.[446] Unlike other options, this proposal is actually happening, albeit not quickly, as the EPA is slowly incorporating the ESA

443. *See* Centner, *Governments and Unconstitutional Takings*, *supra* note 211, at 88 ("[C]oncern has been expressed that a few right-to-farm laws have been amended to provide too much protection for agricultural pursuits and other activities at the expense of neighboring property owners."); Centner, *Damages from Pesticide Spray Drift Under Trespass Law*, *supra* note 37, at 16 (arguing for a trespass cause of action as an alternative to a nuisance suit).

444. 494 P.2d 700, 703–06 (Ariz. 1972).

445. GA. CODE ANN. § 41-1-7(a) (2025) ("It is the declared policy of the state to conserve, protect, and encourage the development and improvement of its agricultural and forest land and facilities . . . .").

446. Durand-Johnson, *supra* note 38, at 253–54.

into its FIFRA registration protocols.[447] The precedents that supported the distinction between EPA's responsibilities with regard to FIFRA versus the ESA had been crumbling in recent years, which ultimately put this proposal into practice.[448]

In 2022, the EPA relented and published a workplan entitled *Balancing Wildlife Protection and Responsible Pesticide Use*.[449] This workplan has already resulted in a negative effect on domestic agricultural efficiency, with EPA's most pressing registration deadline—the next iteration of post-emergent dicamba herbicides—being set back for years.[450] By incorporating additional requirements into the pesticide registration process, the timeline for pesticide development has become unpredictably longer.[451]

The point in time when a pesticide can be commercially sold is much harder to predict under this proposal.[452] As evidenced by post-emergent dicamba, a company's ability to predict when its pesticide will be registered is a crucial aspect of the process.[453] Scott Partridge, Monsanto's Vice President of Global Strategy in 2017, stated that Monsanto expected that post-emergent dicamba would be approved around the same time as dicamba-tolerant seeds.[454] Partridge noted that "[t]he EPA process was lengthier than usual."[455]

447. Whitney Haigwood, *EPA Policy and Proposals: 4 Fundamentals of the ESA-FIFRA Process*, FARM PROGRESS (Jan. 30, 2024), https://www.farmprogress.com/farm-policy/epa-policy-and-proposals-4-fundamentals-of-the-esa-fifra-process- [https://perma.cc/RZ3A-28CW].

448. *Id.* ("This lag [in pesticide registration] has opened the door to mounting lawsuits in recent years, resulting in settlements and court orders against the EPA."); Durand-Johnson, *supra* note 38, at 261–62.

449. *EPA's Workplan and Progress Toward Better Protections for Endangered Species*, U.S. ENV'T PROT. AGENCY (Nov. 6, 2024), https://www.epa.gov/endangered-species/epas-workplan-and-progress-toward-better-protections-endangered-species [https://perma.cc/9M44-G2L2].

450. *See* MICHAEL D.K. OWEN ET AL., IOWA STATE UNIV. EXTENSION & OUTREACH, 2025 HERBICIDE GUIDE: IOWA CORN AND SOYBEAN PRODUCTION 5 (2024), https://store.extension.iastate.edu/product/12150.pdf [https://perma.cc/85WK-JVC3] (noting that the Herbicide Strategy component of the incorporation of ESA into FIFRA registration standards will take years to complete).

451. Betty Haynes, *Beyond Dicamba: Problems, Questions and Options*, FARM PROGRESS (Mar. 22, 2024), https://www.farmprogress.com/crop-protection/beyond-dicamba-problems-questions-and-options [https://perma.cc/7A3Y-PMLG].

452. *See id.*

453. Flitter, *supra* note 173.

454. *Id.*

455. *Id.*

The delays due to additional requirements under the ESA have already caused concern among state agricultural agencies.[456] Delays in the pesticide registration process led to illegal post-emergent dicamba applications in 2015 and 2016, and now state agencies are concerned that 2025, where farmers have dicamba-tolerant seeds and pre-emergent dicamba, will yield the same result.[457]

Applying the balancing test here, the effect on agricultural efficiency, as demonstrated by the delay in herbicide registration, will be undeniably adverse for farmers. The potential for environmental disaster without timely post-emergent dicamba options could be great given the potential for unlawful pre-emergent application, regardless of how well-intentioned the environmental motives behind incorporating the ESA are. The effect on consumer health is once again likely null, as the ESA was not designed to improve human health.[458]

IV. RECOMMENDATIONS

Despite the shortcomings of the aforementioned proposals, solutions do exist that both pass the balancing test and remedy the fundamental wrongs associated with pesticide drift. This Article sets forth three such proposals. Each proposal presents an opportunity to increase social welfare as measured by the same balancing test used to grade the aforementioned proposals. While none of the following proposals are dependent on each other per se, the three proposals could be implemented simultaneously without interference from each other.

A. Amending Right-to-Farm Acts

The purpose of the tort of nuisance is to ensure that property owners maintain the right to reasonably use and enjoy their own property.[459] Right-to-farm acts fundamentally reduce this right for property owners who live near farms with the policy justification of protecting agriculture.[460] Unfortunately, right-to-farm acts preclude farmers from recovering damages via nuisance even when pesticide drift

456. Jenkins, *OTT Dicamba Labels Unlikely for 2025*, *supra* note 422.

457. *Id.*

458. *See Summary of the Endangered Species Act*, U.S. ENV'T PROT. AGENCY (July 31, 2024), https://www.epa.gov/laws-regulations/summary-endangered-species-act [https://perma.cc/H44X-KD5C].

459. Ann O'Connell & Stacy Barrett, *Private vs. Public Nuisance Claims Against Property Owners*, ALLLAW (Aug. 7, 2023), https://www.alllaw.com/articles/nolo/personal-injury/private-public-nuisance-claims-property-owners.html [https://perma.cc/K6GL-BMBD].

460. Centner, *Governments and Unconstitutional Takings*, *supra* note 211, at 87–88.

reduces the quantity and quality of their harvested yields.[461] In essence, the very legislation meant to protect farmers serves as a detriment to a significant portion of them.

An intuitive solution exists for the catch-22 of right-to-farm acts. Legislatures must fix this problem by passing narrow amendments to their right-to-farm acts that provide an exception to farmers' anti-nuisance protections.[462] Specifically, this exception should only allow nuisance suits to be alleged against a defendant-farmer by a plaintiff-farmer who suffered financial losses as a result of the defendant's farming activities.[463] By providing this limitation, the potential range of unintended consequences is greatly reduced due to a smaller pool of eligible plaintiffs.

Whereas the proposal to use trespass as a means of recourse is broad, allowing nuisance suits between farmers is fairly limited in scope and thus minimizes unintended consequences.[464] If legislatures remain concerned about unintended consequences, an additional limitation could require that the financial losses be incurred specifically as a result of the defendant-farmer's drifting herbicides.

Though minimizing unintended consequences, the proposal to amend right-to-farm acts has several intended consequences. Amending right-to-farm acts as described provides farmers who suffer drift-related losses desperately needed leverage to force applicators to the negotiating table.[465] The sheer volume of dicamba drift cases should help in establishing norms for negotiations, meaning

461. Nicholas Brown et al., *Tort Tradeoffs in Cases of Pesticide Drift: A Legal and Economic Analysis*, PLOS ONE, Oct. 24, 2022, at 1, 6 [hereinafter Brown et al., *Tort Tradeoffs in Cases of Pesticide Drift*] ("There is not a wide body of case law concerning the application of nuisance law to pesticide drift because, in many states, right-to-farm acts prevent most nuisance suits against farms.").

462. Brown & Roessing, *supra* note 161, at 43–44.

463. *Id.* (establishing a framework for such an amendment to right-to-farm acts). Fortunately, all right-to-farm acts provide definitions of farm, agricultural operation, etc. which minimizes the prerequisite legal groundwork. *See States' Right-to-Farm Statutes*, NAT'L AGRIC. L. CTR. (Mar. 20, 2025, 8:12 AM), https://nationalaglawcenter.org/state-compilations/right-to-farm/ [https://perma.cc/8SGN-ENTX].

464. *See* discussion *supra* Section III.C.

465. *See* Brown & Roessing, *supra* note 161, at 44.

that trial would be a disfavored last resort in light of alternative dispute resolution mechanisms.[466] As such, transaction costs on both sides would be minimized.[467]

This first intended consequence of streamlined negotiations should lead to the second intended consequence—meaningful crop insurance. Particularly, streamlined negotiations should lead to crop insurance that covers losses from pesticide drift. Whereas current legal circumstances make recovery of drift-related damages uncertain or impossible, this amendment would eliminate the uncertainty that has scared off insurance companies for years.[468]

The third and final intended consequence of amending right-to-farm acts pertains to herbicide manufacturers. Applicators will no longer be able to generally escape liability for drift-related damages.[469] As such, applicators will demand less volatile herbicides. Herbicide manufacturers will subsequently face this market pressure and allocate more resources to reducing post-emergent dicamba volatility or replacing the herbicide-crop system altogether.[470]

The proposal to amend right-to-farm acts thus provides an increase in agricultural efficiency by providing a means of recovery that minimizes transaction costs. By placing pressure on pesticide manufacturers to fix dicamba's volatility issues, the environment will likewise benefit. Consumer health should be unaffected by this proposal. Therefore, this proposal should increase social welfare relative to the current state of affairs.

B. Allowing State Action Under Section 24(c)

As noted in the *What Happened* section, the EPA on October 30, 2020, announced that states are no longer permitted to impose their own restrictive

466. *See* Emina Sadic Herzberger, Note, *The Gig Economy's Short Reach: An Analysis of the Scope of the Federal Arbitration Act's "Transportation Worker" Exemption*, 56 GA. L. REV. 299, 306 (2021) ("Alternative dispute resolution (ADR) mechanisms, including arbitration, mediation, and negotiation, operate as a substitute for litigation by offering an efficient and effective means to resolve disputes between parties.").

467. *See* Brown & Roessing, *supra* note 161, at 44.

468. Unglesbee, *Dicamba: Who's Liable?*, *supra* note 231 ("[I]f you don't have history for a product or situation, the actuary can't determine risk and its cost."); *see* discussion *supra* Section II.D.2.

469. Brown & Roessing, *supra* note 161, at 44.

470. Brown et al., *Tort Tradeoffs in Cases of Pesticide Drift*, *supra* note 461, at 18 ("[I]t should be unsurprising that the losers in a nuisance system [under an amended right-to-farm act] are farmers of [herbicide tolerant] crops and consequently the companies that produce these seeds and their corresponding herbicides.").

measures on pesticide use under Section 24(c) of FIFRA.[471] This move is short-sighted and should be reversed in the interest of determining the best ways to address the drift issue.

Despite the length of this Article's *Introduction* and *Background*, the complexity of this issue on a state-by-state basis has mostly been excluded for the sake of brevity. After the disastrous 2017 growing season, state agricultural agencies started playing an active role in proactively reducing dicamba drift.[472] By comparing total soybean production and total acres of soybeans damaged by dicamba drift, a noticeable difference can be detected among the leading soybean producers. For example, in 2017, Arkansas reported 900,000 acres of soybeans damaged by dicamba drift out of the approximately 3.5 million acres of soybeans harvested.[473] On the other hand, in 2017, Iowa only reported 150,000 acres of soybeans damaged by dicamba drift out of the approximately 9.95 million acres of soybeans harvested.[474] Thus, Iowa had almost three times as many soybean acres as Arkansas but reported six times less soybean acres damaged by dicamba. Nevertheless, Iowa would have its worst issues with drift in 2020 due to a variety of state-specific factors.[475]

The EPA's decision to preclude state involvement via Section 24(c) is even more questionable considering the Ninth Circuit's criticism of the EPA's

471. *See supra* text and accompanying note 193; Emily Unglesbee, *EPA, States Clash Over Pesticides*, PROGRESSIVE FARMER (Nov. 6, 2020, 4:58 PM) [hereinafter Unglesbee, *EPA, States Clash Over Pesticides*], https://www.dtnpf.com/agriculture/web/ag/crops/article/2020/11/06/epa-throws-roadblock-state-dicamba [https://perma.cc/FP6B-6BY5].

472. Brown & Roessing, *supra* note 161, at 12–13.

473. *Compare Quick Stats Arkansas*, NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC. (2017), https://quickstats.nass.usda.gov/results/974007A6-475C-3CC2-AE48-6A2E63544BA1 [https://perma.cc/SH7Y-DMYY] (showing total soybean acres harvested in Arkansas in 2017), *with* Bradley, *A Final Report on Dicamba*, *supra* note 21 (showing acreage of soybeans damaged by dicamba drift in Arkansas in 2017).

474. *Compare Quick Stats Iowa*, NAT'L AGRIC. STAT. SERV., U.S. DEP'T OF AGRIC. (2017), https://quickstats.nass.usda.gov/results/1B2437D0-02A7-31EF-B2BB-344938999905 [https://perma.cc/Y4VA-SHUY] (showing total soybean acres harvested in Iowa in 2017), *with* Bradley, *A Final Report on Dicamba*, *supra* note 21 (showing acreage of soybeans damaged by dicamba drift in Iowa in 2017).

475. Bob Hartzler & Prashant Jha, *Dicamba 2020: What Went Wrong in Iowa?*, IOWA STATE UNIV. EXTENSION & OUTREACH: INTEGRATED CROP MGMT BLOG (July 8, 2020), https://crops.extension.iastate.edu/blog/bob-hartzler-prashant-jha/dicamba-2020-what-went-wrong-iowa [https://perma.cc/AXY6-CM9H] (detailing several factors underlying the increase in Iowa's drift damage).

restrictions on post-emergent dicamba labeling.[476] When the Ninth Circuit vacated the EPA's registration of post-emergent formulations of dicamba, the court blasted the EPA for providing restrictions on dicamba use that were incredibly hard to follow.[477] Moreover, many of the requirements set forth in recent dicamba labels were originally state-level regulations (e.g., application cutoff dates and times).[478]

In short, the EPA's decision to stop state-level restrictions via Section 24(c) ignores the sheer complexity of each state's agricultural issues and each state's ability to address the issue.[479] By restoring each state's ability to formulate its own rules, the EPA could enable each state to better manage its respective challenges. Furthermore, each state could learn from the good decisions and mistakes of other states moving forward. Both effects would increase agricultural efficiency as states became more adept at proactively minimizing dicamba drift. As always, the minimization of dicamba drift would improve the environment. Consumer health is likely unaffected. Thus, this proposal would yield a net increase in social welfare.

C. Re-Structuring Complaint Filing Procedures

With Section 24(c) hopefully providing more restrictions as implemented by state agricultural agencies, the EPA should dedicate more resources to addressing individual reports of dicamba damage. Since dicamba drift became such a hot button issue, state agencies have been scrambling to investigate each of the many reported dicamba drift instances.[480] As a result of state agencies attempting to respond to each allegation of damage, these agencies have been falling behind on their other duties like inspecting pesticide use at schools.[481]

476. *See* Nat'l Fam. Farm Coal. v. U.S. Env't Prot. Agency, 960 F.3d 1120, 1124 (9th Cir. 2020).

477. *Id.* ("Record evidence shows that the restrictions on the 2016 and 2017 labels had already been difficult if not impossible to follow for even conscientious users; the restrictions on the 2018 label are even more onerous.").

478. Emily Unglesbee, *Digging into Dicamba Rules*, GREAT AM. INS. GRP. (Nov. 2, 2018), https://greatamericancrop.com/news-resources/article/2018/11/02/digging-into-dicamba-rules [https://perma.cc/5YJ5-CLKC].

479. *See id.*

480. Dan Charles, *Pesticide Police, Overwhelmed by Dicamba Complaints, Ask EPA for Help*, NPR: THE SALT (Feb. 6, 2020, 7:19 AM), https://www.npr.org/sections/thesalt/2020/02/06/800397488/pesticide-police-overwhelmed-by-dicamba-complaints-ask-epa-for-help [https://perma.cc/47BN-E7D4] (noting that seven of Missouri's eight pesticide inspectors left their jobs over an 18-month period due to heavy workload associated with spikes in dicamba-related complaints).

481. *Id.*

In addition to falling behind on their other duties, state agencies are generally only publishing the number of complaints that farmers submit.[482] Each state has a different method for reporting dicamba damage.[483] As such, states with easier methods of reporting damage might receive more complaints even if the actual damage is no different. Moreover, states rarely publish the actual results of their investigations into alleged drift, meaning that any data analysis is based entirely on unverified complaints of drift.[484]

These weaknesses in the data underlying dicamba's drift research may have made the EPA wary of such data. In *National Family Farm Coalition*, the EPA argued that "complaints to state departments of agriculture of dicamba damage could have either under-reported or over-reported the actual amount of damage."[485] To be clear, the Ninth Circuit wholly rejected the notion that actual damage was over-reported, noting that "[t]he record clearly shows that complaints understated the amount of dicamba damage."[486] In rejecting the EPA's argument, the Ninth Circuit repeatedly cited to the increase in complaints of drift damage across several states and the fact that no one except Monsanto believed the numbers were over-reported.[487] By citing to an increase in complaints, the Ninth Circuit's argument overlooks what the EPA was trying to establish regarding state damage reports. If the mechanism for making complaints is flawed, then changes in the number of submitted complaints is unsatisfactory evidence.

The EPA needs to address this issue in order for dicamba drift data to be useful in corporate and regulatory settings. Specifically, the EPA should assume responsibility for receiving and investigating pesticide drift complaints. Once this role is assumed from state agencies, the EPA needs to establish a uniform procedure for submitting and handling complaints in order for data to be comparable between states. Moreover, the EPA needs to go one step further than the states and publish the results of each investigation, including whether or not the complaint asserted verifiable drift damage.

By taking on this responsibility, the EPA would alleviate the increased burden on state agricultural agencies. The resulting improvements in data quality and comparability should aid both private and government researchers, thereby

482. *See id.*; Bradley, *July 15 Dicamba Injury Update*, *supra* note 26.

483. *See* Unglesbee, *Herbicide Injury*, *supra* note 27.

484. *See id.* (citing figures such as complaints received alleging dicamba damage and "pesticide misuse complaints").

485. Nat'l Fam. Farm Coal. v. U.S. Env't Prot. Agency, 960 F.3d 1120, 1137 (9th Cir. 2020).

486. *Id.*

487. *Id.* at 1137–38.

increasing agricultural efficiency. Furthermore, improved drift data could help lessen pesticide damage to the surrounding environment. Consumer health is likely unaffected. Due to the improvements to agricultural efficiency and the environment, this proposal should increase social welfare beyond its current point.

V. CONCLUSION

The pesticide regulatory scheme created under FIFRA was designed to be comprehensive.[488] For every pesticide applied on a farm, the EPA is tasked with ensuring that the improvement to agricultural efficiency will not unreasonably adversely affect environmental and consumer health.[489] For decades, FIFRA has regulated domestic pesticide use not in a perfect manner, but in an effective manner that the country could rely upon to ensure a steady food supply without widespread, dangerous effects on the environment or consumer health.[490] The ongoing situation involving dicamba-tolerant crops has rapidly escalated in magnitude due to flaws in FIFRA and certain state laws that had previously been a relatively minor issue to most individuals.[491]

Many individuals have strong feelings about the situation. From the farmer who simply wants to ensure his or her farm's financial stability to the environmental or consumer health advocate who has concerns about pesticide use, the proposals affecting how pesticide regulation is conducted in the United States are both numerous and diverse. The congressional intent made clear under FIFRA's registration procedures—to improve agricultural efficiency without unreasonable adverse effects on the environment or consumer health—should pa major role in balancing the merits of these proposals.[492] Many proposals result in untenable effects on either farming itself or environmental and consumer health. Other proposals strike an appropriate balance, and, if implemented, would result in a net gain in social welfare that has been adversely affected by the current regulatory scheme's inability to manage agricultural interests in light of environmental and consumer health concerns.

488. *See* Haigwood, *supra* note 447.
489. *Id.*
490. *See id.*
491. *See* Unglesbee, *EPA, States Clash Over Pesticides*, *supra* note 471.
492. *See* 7 U.S.C. § 136(bb).