GONE WITH THE WIND: WHY SOUTH CAROLINA SHOULD LIMIT GMO FARMERS' TORT LIABILITY POSED BY DRIFTING GM POLLEN

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Abstract

The production and consumption of genetically modified organisms is a hot-button controversy riddled with political and ethical debates that translate over into the judicial sphere. While the growth and production of these organisms exposes both GM seed manufacturers and GMO farmers to regulatory and tort-based liabilities, non-GMO farmers have yet to bring their neighboring GMO farmers to court. Instead, non-GMO plaintiffs have gone after the deep-pocketed manufacturers for their cross-contamination claims. Such claims often involve traditional, non-GMO farmers alleging injury from cross-pollination by neighboring GM crops, going after the defendant manufacturers on theories like mislabeling, products liability, nuisance, trespass, and negligence. In the few cross-contamination suits brought by non-GMO farmers against GM seed manufacturers, the different courts' approaches to the claims have often only scraped the surface of the relevant science implicated by the issue. Although non-GMO farmers have yet to sue their GMO farmer neighbors, this Note seeks to highlight how South Carolina's tort regime may unnecessarily expose GMO farmers to liability when such exposure is inconsistent with generally accepted scientific principles and sound public policy.

As a starting point, Sections I and II explore the science behind the growth and production of the heavily debated GM crops at issue before addressing related litigation and public policy views on GMOs. Section III then looks to different jurisdictional approaches to cross-contamination suits brought against GM seed manufacturers to analyze how some courts have viewed GM crop cross-pollination for a variety of tort claims. Specifically, the Section looks to whether

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genetic drift constitutes a legal injury rather than an economic harm and whether GMO farmers are likely to satisfy intent and causation for trespass and nuisance claims. Further, these judicial approaches are then reviewed from a scientific viewpoint to determine if the courts' legal reasoning aligns with the scientific realities of GM crop production. Lastly, Section III looks at the likely arguments for a negligence claim, pointing to public policy and accepted scientific principles to argue that South Carolina should not impose a duty on GMO farmers to mitigate cross-pollination. Section IV concludes this Note with recommendations on how South Carolina courts should posit their approach to the issue of GM crop to non-GM crop cross-contamination claims by reiterating that the economic and health benefits offered by GMOs require their continued production such that GMO farmers should not be exposed to tort liability.

I. INTRODUCTION: WHAT IS A GMO AND WHY SHOULD THE LEGAL COMMUNITY CARE?

The growth and production of bioengineered ("BE") foods and genetically modified organisms ("GMO"s) is a controversial topic in the United States, largely due to the general public's lack of education of the science behind the terms. One study specifically reports that 38% of participants in the United States viewed GMOs as "generally [unsafe] to eat[,]" despite this belief being "at odds with scientific consensus."[1] The study further notes that individuals who completed three or more "science courses during their secondary or tertiary schooling" are more likely to regard GMOs as safe for consumption.[2] Despite public misconception, genetically modified ("GM") crops have a variety of benefits, including furthering sustainable agriculture and combatting global health issues.[3] Aiding in sustainable agriculture, some GM crops are engineered for pesticide and herbicide resistance, allowing for a decrease in pesticide usage and in soil tillage, respectively, along with an overall decrease in greenhouse gas emissions.[4] Regarding global health issues, some BE foods utilize biofortification[5] to combat specific epidemics such as golden rice's creation to help populations

1. Brian Kennedy & Cary Lynne Thigpen, *Many Publics Around World Doubt Safety of Genetically Modified Foods*, PEW RSCH. CTR. (Nov. 11, 2020), https://www.pewresearch.org/short-reads/2020/11/11/many-publics-around-world-doubt-safety-of-genetically-modified-foods/ [https://perma.cc/6E5V-95Z2].

2. *Id.*

3. Jörg Romeis et al., *Genetically Engineered Crops Help Support Conservation Biological Control*, 130 BIOLOGICAL CONTROL 136, 148 (2019).

4. WHY DO FARMERS IN THE U.S. GROW GMO CROPS? (Mar. 5, 2024), https://www.fda.gov/food/agricultural-biotechnology/why-do-farmers-us-grow-gmo-crops [https://perma.cc/P3MT-8WMF].

5. Biofortification refers to the "process of increasing the density of vitamins and minerals in a crop through plant breeding, transgenic techniques, or agronomic practices." Howarth E. Bouis & Amy Saltzman, *Improving Nutrition Through Biofortification: A Review of Evidence from HarvestPlus, 2003 through 2016*, 12 GLOB. FOOD SEC. 49, 49 (2017).

suffering from vitamin A deficiency ("VAD").[6] Generally, GMOs and BE foods are produced to help farmers decrease production costs and increase the crop's resistance to a variety of common abiotic and biotic stresses.[7] For example, among many other GMOs in the United States, GM corn and GM cotton are produced to express pesticide resistance, with GM corn also produced to express herbicide resistance.[8] The majority of corn grown in the United States is genetically modified,[9] and, of relevance, cotton and corn are two of the top ten commodities grown in South Carolina.[10]

In general, farmers wishing to grow GM crops purchase GM seeds from manufacturers,[11] with the patented modified sequencing approved by the appropriate regulatory agencies and regarded as safe for a specific class of consumption.[12] Given public misconceptions, GMO farmers face a slew of regulatory hurdles and novel litigation risks associated with producing such controversial crops.[13] Traditional, non-GMO farmers across the country have brought suit against GM seed manufacturers under a variety of tort theories including negligence, trespass, nuisance, and strict liability while trying to survive under applicable economic loss theories.[14] Most of these disputes are class actions or multidistrict litigations against the GM seed manufacturers

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6. Mark Lynas, *How Genetically-Modified Crops Can Save Hundreds of Thousands from Malnutrition*, THE BREAKTHROUGH INST. (Mar. 7, 2013), https://thebreakthrough.org/issues/food-agriculture-environment/how-genetically-modified-crops-can-save-hundreds-of-thousands-from-malnutri?gad_source=1&gbraid=0AAAAAodlRDQfg9I8J5yCAOWo5hZ7-Ldhs&gclid=CjwKCAjwodC2BhAHEiwAE67hJAd8xtMGz-eOxcsQk3N-T0JQ3Nd9yB9eZgtVlihF1CAYH4_NnD35mhoCdaAQAvD_BwE [https://perma.cc/85QP-CH2D]; *Golden Rice FAQs*, INT'L RICE RSCH. INST., https://www.irri.org/golden-rice-faqs [https://perma.cc/AB2L-W3VV].

7. *See* David Zilberman et al., *Agricultural GMOs—What We Know and Where Scientists Disagree*, 10 SUSTAINABILITY 1514, 1516, 1518 (2018).

8. *See* FDA, GMO CROPS, ANIMAL FOOD, AND BEYOND (Mar. 5, 2024), https://www.fda.gov/food/agricultural-biotechnology/gmo-crops-animal-food-and-beyond [https://perma.cc/FX4P-5Y6U].

9. *Corn*, ENCYC. BRITANNICA, https://www.britannica.com/plant/corn-plant [https://perma.cc/7FQA-GPSC] (Feb. 26, 2025).

10. S.C. DEP'T OF AGRIC., ABOUT: AGRICULTURE IN SOUTH CAROLINA, https://agriculture.sc.gov/about/ [https://perma.cc/HXL4-YXJE].

11. *See generally GM Developers List*, INT'L SERV. FOR THE ACQUISITION OF AGRI-BIOTECH APPLICATIONS, https://www.isaaa.org/gmapprovaldatabase/developerlist/default.asp [https://perma.cc/296Y-EYLC] (listing manufacturers who sell GMO seeds).

12. *See* FDA, HOW GMOS ARE REGULATED IN THE UNITED STATES (Mar. 5, 2024), https://www.fda.gov/food/agricultural-biotechnology/how-gmos-are-regulated-united-states [ttps://perma.cc/KY9J-9LFZ].

13. *See* USDA, REGULATION OF BIOTECH PLANTS, https://www.usda.gov/farming-and-ranching/plants-and-crops/biotechnology/regulation-biotech-plants [https://perma.cc/QP2M-D7U6].

14. *See, e.g.*, *In re* StarLink Corn Prods. Liab. Litig., 212 F.Supp.2d 828 (N.D. Ill. 2002); *In re* Dicamba Herbicides Litig., 359 F.Supp.3d 711 (E.D. Mo. 2019); *In re* Syngenta AG MIR 162 Corn Litig., 131 F.Supp.3d 1177 (D. Kan. 2015).

with none thus far directed towards the GMO farmers themselves.[15] The disputes center around either the appearance of GM sequences in the farmer's own non-GM crop's genome, likely due to genetic drift,[16] from GMOs growing on nearby farms or crop loss caused by herbicide drift meant for neighboring, resistant GM crop fields.[17] Though the suits are targeted at the GM seed manufacturers, the plaintiff farmers in those cases essentially argue that the appearance of the GM sequences amounts to a legally recognizable injury due to the resulting economic loss.[18] Further, the farmers impliedly argue that those growing the GM crops should be liable under various tort theories for any resulting genetic drift of the GM sequences in their non-GM crop population.[19] South Carolina has yet to address the issue, but many jurisdictions reviewed these arguments under their respective tort regimes[20] with some scholars proposing alternative legal approaches to this issue.[21]

Although the regulatory landscape offers little clarity on a GMO farmer's tort liability, existing regulations do show a clear intent to support the coexistence of GMO and non-GMO farmers through guidelines such as transparent labeling requirements. Specifically, there are federal label disclosure requirements for BE foods[22] to distinguish those containing GM sequencing and those certified non-GMO, while three federal agencies are tasked with regulating GMO production.[23] Most regulatory related litigation issues involve labeling disputes with plaintiffs arguing over misleading

15. *See, e.g.*, *In re Starlink*, 212 F.Supp.2d at 833; *In re Dicamba*, 359 F.Supp.3d at 718; *In re Syngenta*, 131 F.Supp.3d at 1187.

16. Genetic drift is an evolutionary mechanism that describes the at-chance change of allele frequency in a population. CHARLES ROTIMI, NAT'L HUM. GENOME RSCH. INST., GENETIC DRIFT, https://www.genome.gov/genetics-glossary/Genetic-Drift [https://perma.cc/62CY-UGWR] (Mar. 19, 2025).

17. *See, e.g.*, *In re StarLink*, 212 F.Supp.2d at 834 (discussing cross-breeding of different corn varieties due to drift from neighboring farms); *In re Dicamba*, 359 F.Supp.3d at 718 (discussing allegations that GM seed drift into nearby orchard damaged trees and crop yield); *In re Sygenta*, 131 F.Supp.3d at 1186 (discussing cross-pollination from neighboring fields).

18. *See, e.g.*, *In re StarLink*, 212 F.Supp.2d at 835; *In re Dicamba*, 359 F.Supp.3d at 719; *In re Syngenta*, 131 F.Supp.3d at 1187.

19. Plaintiffs in these suits go one step further to argue the manufacturers should be held liable because the cross-contamination is a foreseeable and inevitable consequence of growing GMOs, see, e.g., *In re Starlink*, 212 F.Supp.2d at 834–35; *In re Dicamba*, 212 F.Supp.2d at 718–19; *In re Syngenta*, 131 F.Supp.3d at 1186, but the implicit argument against the farmer's themselves outlined above follows from these allegations.

20. *See, e.g.*, *In re StarLink*, 212 F.Supp.2d at 838–49; *In re Dicamba*, 359 F.Supp.3d at 727–30; *In re Syngenta*, 131 F.Supp.3d at 1188–221.

21. *See* A. Bryan Endres & Lisa Schlessinger, *Pollen Drift: Reframing the Biotechnology Liability Debate*, 118 PA. STATE L. REV. 815, 853–57 (2014); Michael H. Carpenter, Jr., *Beware of the Genetically Modified Crop: Applying Animal Liability Theory in Crop Contamination Litigation*, 23 BUFF. ENV'T L.J. 63, 94–97 (2016).

22. *See* 7 U.S.C § 1639b (2016).

23. HOW GMOS ARE REGULATED IN THE UNITED STATES, *supra* note 12.

"natural" or "non-GMO" labels.[24] Under past related tort claims, non-GMO farmers have brought suit against GM seed manufacturers, arguing that the loss of non-GMO labeling status per these guidelines from genetic drift injured them in a variety of ways.[25]

Genetic drift of such GM sequences often occurs through cross-pollination, a necessary and regular occurrence in the ordinary course of growing flowering crops.[26] GM crops reproduce in the same manner as their non-GMO counterparts, so if the crop can reproduce via cross-pollination, its GMO counterpart can as well.[27] In the case of non-GMO or organic farmers neighboring with GMO farmers, this natural fertilization process may lead to non-GMO farmers turning to tort claims to recover for the loss of non-GMO or organic status, alleging that the unwanted GM sequence now in their crop's genome and the mandatory label change amounts to an injury.[28] However, the inevitability of cross-pollination in an open-air field along with the plethora of health and scientific benefits that GMOs offer strongly support protecting GMO farmers against such tort liability.[29] Rather, non-GMO farmers should bear the burden of mitigation measures to minimize genetic drift to align with the public policy demand that GMO production not be burdened by such litigation risks or regulatory hoops.

In the current academic literature landscape, a variety of scholars recognize the current tort regime as ill-fitting to handle the nuanced issues presented by drifting GM sequences, with each proposing a variety of alternative approaches.[30] One author would impose a federal statute to "clearly delineate[] genetic drift liability for . . . farmers who develop or use GM crop seeds . . . ."[31] Most notably, Professors Bryan Endres and Lisa Schlessinger argue that the current regime too heavily favors GMO farmers to the disadvantage of non-GMO farmers and propose that the "GMO farmer [should] bear[] sole responsibility for [establishing a] buffer zone" to prevent genetic drift from GM to non-GM crops.[32] Endres and Schlessinger's argument aligns with this Note's stance that pollen drift in an open-air field containing cross-pollinating crops is an inevitable occurrence.[33] The

24. *See, e.g.*, *In re* Kind LLC "Healthy & All Natural" Litig., 287 F.Supp.3d 457, 461–62 (S.D.N.Y. 2018); Garcia v. Kashi Co., 43 F.Supp.3d 1359, 1368 (S.D. Fla. 2014).

25. *See, e.g.*, *In re Starlink*, 212 F.Supp.2d at 834; *In re Syngenta*, 131 F.Supp.3d at 1186.

26. *See* Peter Thomison & Allen Geyer, *Managing "Pollen Drift" to Minimize Contamination of Non-GMO Corn*, OHIO STATE UNIV.: OHIOLINE (Mar. 15, 2016), https://ohioline.osu.edu/factsheet/agf-153 [https://perma.cc/8VAA-7VLT].

27. *See id.*

28. *See infra* text accompanying notes 119-132.

29. *See infra* text accompanying notes 246-264.

30. *See* sources cited *supra* note 21.

31. Carpenter, Jr., *supra* note 21, at 94.

32. Endres & Schlessinger, *supra* note 21, at 856.

33. *Id.* at 832.

Professors analyze trespass, nuisance, strict liability, and negligence claims on the issue accordingly, arguing that the tort regime is ill structured to handle the liability issues posed by the drifting GM pollen.[34] Despite this Note agreeing with much of Endres and Schlessinger's analytical points, the scientific lens utilized here—rather than the economic prescription utilized by the Professors—guides it to the opposite conclusion.[35] Endres and Schlessinger argue an economic review of GMO and non-GMO production justify placing the burden to mitigate the risk of GM pollen drift squarely on the shoulders of GMO farmers, while this Note argues that resounding public policy support requires GMO farmers be relieved of liability from genetic drift to better support and encourage GMO production.

Before simply falling in line with litigation trends and other jurisdictional anti-GMO approaches, South Carolina should consider other factors—ones based in the very science the law is controlling—to avoid imposing an impossible burden on its GMO farmers. This Note analyzes the associated litigation risks of growing GMOs and BE foods in South Carolina, arguing that science and general tort principles demand that, under genetic drift events from GM pollen, tort liability be limited to avoid burdening GMO production. Specific points include that defendant GMO farmers should fail to satisfy the intent and causation elements under trespass and nuisance theories and that cross-pollination of GM and neighboring non-GM crops occurring in the ordinary course of growing, while a harm, should not be a legal injury. Lastly, this Note points to the federal regulatory support of continuing the production of both GMOs and non-GMOs and the associated public policy push for transparent consumer product choice as a basis for South Carolina to refuse imposing a duty of mitigation measures on GMO farmers.

II. UNDERSTANDING THE SCIENCE BEHIND THE GMO ISSUE

This Note's argument that South Carolina should refuse recognition of genetic drift as an injury and prevent satisfaction of intent or causation from the spread of GM material to neighboring crops is rooted in the science of a GMO. Plenty of purchasers in the general public along with entire organizations are vehemently opposed to BE foods and GMOs for human consumption,[36] with some describing the creation of such foods as scientists "playing God."[37] However, much of this fear likely stems from a lack of

34. *See id.* at 831–48.

35. *Id.* at 815–57.

36. *E.g.*, *About the Non-GMO Project*, NON-GMO PROJECT, https://www.nongmoproject.org/about/ [https://perma.cc/5HSV-6EBK].

37. Dhivya Bala, *Scientific Discourse Powers Public Fear on GMOs*, THE DET. WRITING ROOM (Sept. 23, 2021), https://www.detroitwritingroom.com/2021-journalism-camp-stories/scientific-discourse-powers-public-fear-gmos [https://perma.cc/3GU9-CD9W].

understanding of what it means for a food to be classified as "bioengineered," and this God-like comparison bolsters the idea that the general public does not have a complete picture of what the GMO label means. This Section breaks down the science of a GMO to describe its development, benefits, and effects in relation to the current litigation and regulatory landscape. Such points support the argument that South Carolina courts should relieve GMO farmers of related potential tort liabilities as a matter of sound science and alignment with public policy.

A. The Development of GMOs

A genetically modified organism, or GMO, is defined as "a plant, animal or microbe in which one or more changes have been made to the genome . . . in an attempt to alter the characteristics of an organism."[38] Bioengineered foods, or BE foods, a type of GMO,[39] are foods which have had some sort of modification to their genetic material so that it includes gene fragments[40] that do not naturally occur in nature.[41] The terms "genome" and "genetic material" refer to "the entire set of DNA instructions"[42] in the cell, which is the hereditary information passed along to each subsequent generation.[43] Thus, GMOs and BE foods contain an altered DNA sequence inserted through some biotechnological method[44] to place the DNA fragment for a desirable characteristic into the plant's genome to trigger the expression of the targeted

38. MIKE SMITH, NAT'L HUM. GENOME RSCH. INST., GENETICALLY MODIFIED ORGANISM (GMO), https://www.genome.gov/genetics-glossary/Genetically-Modified-Organism [https://perma.cc/5TGX-Z87M] (Mar. 20, 2025).

39. *GMOs and the National Bioengineered Food Disclosure Standard. Does it Apply to You?*, EUROFINS, https://www.eurofinsus.com/food-testing/resources/gmos-and-the-national-bioengineered-food-disclosure-standard-does-it-apply-to-you/ [https://perma.cc/SU7F-Q8CR].

40. Gene fragments are portions of DNA that contain only the "parts of the gene . . . [that] encode the protein sequence." *Gene Fragments*, PBS, https://www.pbs.org/faithandreason/biogloss/genefrag-body.html [https://perma.cc/QM45-C2ZS].

41. USDA, BIOENGINEERED, https://www.ams.usda.gov/sites/default/files/media/BE_Consumer.pdf [https://perma.cc/7STQ-C7QK].

42. ERIC GREEN, NAT'L HUM. GENOME RSCH. INST., GENOME, https://www.genome.gov/genetics-glossary/Genome [https://perma.cc/5CCW-NG33] (Mar. 20, 2025).

43. *See* CK-12, *4.2: DNA, the Genetic Material*, *in* INTRODUCTORY BIOLOGY (CK-12) 4.2 (LibreTexts ed., 2021), https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Introductory_Biology_(CK-12)/04%3A_Molecular_Biology/4.02%3A_DNA_the_Genetic_Material [https://perma.cc/9E9E-E2WL].

44. Biotechnological methods are laboratory techniques and tools, such as genetic engineering, to "alter living organisms, or parts of organisms, to make or modify products; improve plants or animals; or develop microorganisms for specific agricultural use." USDA, BIOTECHNOLOGY FAQS, https://www.usda.gov/farming-and-ranching/plants-and-crops/biotechnology/biotechnology-faqs [https://perma.cc/44V2-6TRQ].

favorable trait.[45] Transgenic plants, a common type of BE food, are plants that "have undergone DNA modification intending to add a new trait to the plant that is not naturally present."[46] In other words, transgenic plants are a meld of carefully chosen genes containing instructions for a desirable characteristic that are pasted into the plant's natural genetic sequence. Courts generally regard transgenic plants as genetically engineered ("GE") crops, BE crops, GM crops, or GMOs, using the terms interchangeably[47] and, for the purposes of this Note, such terms all refer to the same factual scenario.

B. Benefits and Effects of Growing GM Crops

The general purpose of such modifications is to insert a gene fragment that triggers the expression of a favorable trait the crop does not currently possess but could help it survive some abiotic or biotic stress like drought or pests, respectively.[48] Three examples of such favorable traits include herbicide resistance genes, pesticide resistance genes, and viral resistance genes,[49] all of which have been at the center of litigation on occasion.[50] Herbicide resistance genes increase the crop's resistance, thus decreasing its sensitivity, to a specific class of herbicides, allowing farmers to indiscriminately spray the entire field with that herbicide class and kill off only the weeds.[51] Some reasons offered for the choice of herbicide resistant

45. Judith L. Fridovich-Keil & Julia M. Diaz, *Genetically Modified Organism*, ENCYC. BRITANNICA, https://www.britannica.com/science/genetically-modified-organism [https://perma.cc/GF3B-9JUQ] (Mar. 19, 2025).

46. Iqra Noor et al., *Heavy Metal and Metalloid Toxicity in Horticultural Plants: Tolerance Mechanism and Remediation Strategies*, CHEMOSPHERE, Sept. 2022, at 1, 11, https://www.sciencedirect.com/science/article/abs/pii/S0045653522016897 [https://perma.cc/UT9B-JSM3].

47. *See, e.g.*, *In re* StarLink Corn Prods. Liab. Litig., 212 F.Supp.2d 828, 833 (N.D. Ill. 2002) ("genetically engineered . . . corn"); *In re* Dicamba Herbicides Litig., 359 F.Supp.3d 711, 718 (E.D. Mo. 2019) ("genetically modified dicamba-resistant seeds"); *In re* Syngenta AG MIR 162 Corn Litig., 131 F.Supp.3d 1177, 1186 (D. Kan. 2015) ("genetically-modified crop seeds").

48. *See* Yan Zhang et al., *Plants' Response to Abiotic Stress: Mechanisms and Strategies*, INT'L J. MOLECULAR SCIS., June 30, 2023, at 1, 9–10; Ribal Masri & Erzsébet Kiss, *The Role of NAC Genes in Response to Biotic Stresses in Plants*, PHYSIOLOGICAL & MOLECULAR PLANT PATHOLOGY, July 2023, at 1, https://pmc.ncbi.nlm.nih.gov/articles/PMC10341657/ [https://perma.cc/F3K3-D72L]. Biotic stress describes a stress on an organism by some living source such as insects, see Masri & Kiss, *supra*, whereas an abiotic stress is stress on an organism from some non-living source in that environment such as drought, see Zhang et al., *supra*, at 1.

49. *See* WHY DO FARMERS IN THE U.S. GROW GMO CROPS?, *supra* note 4.

50. *See* Monsanto Co. v. Geertson Seed Farms, 561 U.S. 139, 146 (2010); *In re Starlink*, 212 F.Supp.2d at 835; *In re Dicamba*, 359 F.Supp.3d at 718; *In re Syngenta*, 131 F.Supp.3d at 1186.

51. *See* Gesine Schütte et al., *Herbicide Resistance and Biodiversity: Agronomic and Environmental Aspects of Genetically Modified Herbicide-Resistant Plants*, ENV'T SCI. EUR.,

crops include "improved and simplified weed control, less labour [sic] and fuel cost, [and an] extended time window for spraying . . . ."[52] Gene expression for pesticide resistance[53] equips crops with a higher tolerance for a specific class of pesticides, allowing farmers to spray less pesticide in the season than they would otherwise.[54] Tangentially related to pesticide resistance genes, some genetic modifications create GMOs with a form of natural insecticide[55] by containing a gene fragment that encodes for expression of a particular bacterium that is toxic to some insects.[56] One such crop is *Bt* corn, a GMO containing an inserted sequence from the bacterium *Bacillus thuringiensis* (*Bt*) which encodes for a protein that is toxic to a primary predator of the crop, the caterpillar.[57] *Bt* corn is just one example of a GM crop grown in South Carolina with multiple variants available to help control a common species of pests that feed on the crop.[58] Lastly, viral resistance genes help increase a crop's resistance to a particular virus through a variety of biotechnological

Jan. 21, 2017, at 1, 2, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5250645/ [https://perma.cc/LV5B-6TVA] ("To confer resistance to glyphosate," one of the "broad spectrum herbicides," "most glyphosate-resistant crops express . . . glyphosate-insensitiv[ity]."); *What About GMOs and Weeds?*, PURDUE UNIV. COLL. AGRIC., https://ag.purdue.edu/gmos/gmos-weeds.html [https://perma.cc/9E3D-DA9X] ("Resistance to specific herbicides is one of the major traits introduced into genetically modified organisms, or GMOs. This has been done to provide new tools to manage and control weeds in fields of crop plants. Farmers can spray the whole field, but only the weeds will die. The crop will continue to grow without competition from weeds.").

52. Schütte et al., *supra* note 51, at 5.

53. Gene expression refers to a process where a genetic sequence is read by the cell to perform the particular function of which it encodes. LAWRENCE BRODY, NAT'L HUM. GENOME RSCH. INST., GENE EXPRESSION, https://www.genome.gov/genetics-glossary/Gene-Expression [https://perma.cc/Z2L7-XG53] (Mar. 20, 2025).

54. WHY DO FARMERS IN THE U.S. GROW GMO CROPS?, *supra* note 4.

55. Insecticides are a subset of pesticides. Lana Adams, *Less Harmful Pesticides*, PENNSTATE EXTENSION, https://extension.psu.edu/less-harmful-pesticides [https://perma.cc/N8TK-7CY3] (June 30, 2022).

56. Richard L. Hellmich & Kristina Allyse Hellmich, *Use and Impact of Bt Maize*, NATURE EDUC. KNOWLEDGE, 2012, at 4, 6.

57. USDA, AGRIC. RSCH. SERV., EPA APPROVES BT CORN COMMERCIALIZATION, https://www.ars.usda.gov/oc/br/monarch/bt-corn-commercialization/ [https://perma.cc/GNH6-MKJS] (Oct. 5, 2016).

58. *See* Francis Reay-Jones, *Management of Insects in Corn*, *in 2022* SOUTH CAROLINA CORN PRODUCTION GUIDE, CLEMSON COOP. EXTENSION 49, 50 (2022); Roderick M. ReJesus et al., *Economic Analysis of Insect Management Strategies for Transgenic Bt Cotton Production in South Carolina*, 1 NAT'L COTTON COUNCIL 247, 247 (1997).

processes,[59] and their use can "help farmers produce a sustainable, safe food supply."[60]

In addition to the scientific advantages of increased durability, GMOs also offer a multitude of health benefits for consumers and economic benefits for farmers. In the health sphere, GMOs help combat food insecurity by providing a "longer shelf life" for necessary commodities, thus increasing the overall food supply.[61] Additionally, biofortification allows for some GMOs to have a higher nutrient content than their non-GMO counterpart with other methods able to decrease health risks posed by the conventional food.[62] One specific example includes a GM potato altered to decrease the production of carcinogens during its cooking, thus offering a healthier alternative.[63] On the economic front, GMOs offer farmers a more reliable option with crops that are more drought resistant, more disease resistant, and equipped with faster growth cycles.[64] With indisputable benefits to both producers and consumers, GMOs offer an additional choice for both parties to weigh the costs and benefits in deciding what crop to grow or product to purchase.

C. GMOs in the Law

1. Surveying the Current GMO Litigation Landscape

Two main disputes arise in GMO-related litigation: traditional, non-GMO farmers bring suit for either loss of crop yield due to herbicide drift from neighboring GMO fields or for GM sequences from neighboring GM crops appearing in the genome of their own non-GM crops through genetic drift.[65] Within the latter issue, suits either involve patent infringement disputes or loss of non-GMO status of the crossbred, transgenic crops.[66] This Note focuses on

59. Prakash M. Niraula & Vincent N. Fondong, *Development and Adoption of Genetically Engineered Plants for Virus Resistance: Advances, Opportunities and Challenges*, PLANTS, Oct. 2021, at 1, 2–3, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8623320/ [https://perma.cc/P7YK-RYSK]; Oliver Xiaoou Dong & Pamela C. Ronald, *Genetic Engineering for Disease Resistance in Plants: Recent Progress and Future Perspectives*, 180 PLANT PHYSIOL. 26, 27 (2019).

60. WHY DO FARMERS IN THE U.S. GROW GMO CROPS?, *supra* note 4.

61. *Genetically Modified Organisms – GMOs*, NAT'L LIBR. OF MED., https://medlineplus.gov/ency/article/002432.htm [https://perma.cc/2MVJ-NVJ6] (Mar. 4, 2024).

62. *Id.*

63. *See id.*

64. *Id.*

65. *See, e.g.*, *In re* StarLink Corn Prods. Liab. Litig., 212 F.Supp.2d 828, 835 (N.D. Ill. 2002); *In re* Dicamba Herbicides Litig., 359 F.Supp.3d 711, 718–19 (E.D. Mo. 2019); *In re* Syngenta AG MIR 162 Corn Litig., 131 F.Supp.3d 1177, 1187 (D. Kan. 2015).

66. *See Bee-cause It Matters*, NON-GMO PROJECT (June 17, 2019), https://www.nongmoproject.org/blog/bee-cause-it-matters/ [https://perma.cc/LJ9T-A5GX]. Patent disputes are outside of the scope of this Note.

the loss of non-GMO status, as this label change could be the alleged injury argued by non-GMO farmers trying to recover under a tort theory.

Any existence of a GM sequence in a crop renders it ineligible for a non-GMO label, so the risk of pollen drift transferring such sequences likely looms over any non-GMO farmer's head throughout the growing season.[67] Pollen drift is an inevitable occurrence of any flowering crop growing in an open-air field,[68] and GM crops expel pollen and reproduce just as their non-GMO counterparts.[69] Flowering plants, like corn or soybean, reproduce sexually through pollination, which is when pollen spores transfer from a plant's "stamens . . . to the ovule-bearing organs" or "the ovules . . . themselves" leading to fertilization.[70] One subcategory of pollination, cross-pollination, is when one plant pollinates with another plant of the same species[71] through an abiotic source like wind or a biotic source like symbiotic relationships with other species such as bumblebees.[72] Cross-pollination is the mechanism of focus in these sorts of legal disputes, as the GM sequences are appearing from the GM crops cross-pollinating with the non-GM crops of neighboring farms, thus exposing GMO farmers to tort liability.[73]

In the academic landscape, other publications have weighed in on their approaches to this novel issue. Other scholars address the potential tort claims a non-GMO farmer is likely to assert against their neighboring GMO farmers in cases of genetic drift before offering their own recommendations as to how

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67. *See* 7 C.F.R. § 205.400(f) (2024) (requiring persons seeking "organic certification" to "immediately notify" the agency concerning any "[a]pplication, including drift, of a prohibited substance to any field"); National List of Allowed and Prohibited Substances, 7 C.F.R. §§ 205.600–.619; *see also* 7 U.S.C. § 1639b(b) (outlining the scope of regulatory relating to labeling and disclosing bioengineered foods).

68. *See Bee-cause It Matters*, *supra* note 66.

69. *Genetically Modified (GM) Plants: Questions and Answers, If We Grow GM Crops Will They Cross Breed with Other Plants?*, THE ROYAL SOC'Y, https://royalsociety.org/news-resources/projects/gm-plants/if-we-grow-gm-crops-will-they-cross-breed-with-other-plants/ [https://perma.cc/Z6FQ-WZX5] (May 2016).

69. Bastiaan J.D. Meeuse, *Pollination*, BRITANNICA, https://www.britannica.com/science/pollination [https://perma.cc/WHB6-HWDN]; *see also Cross-Pollination*, ENCYC. BRITANNICA, https://www.britannica.com/science/cross-pollination [https://perma.cc/RMD4-XLKZ] (Jan. 24, 2025).

70. Meeuse, *supra* note 69; *see also Cross-Pollination*, *supra* note 69.

71. 12.13: *Self-Pollination and Cross-Pollination*, *in* BIOLOGY FOR MAJORS II (Lumen) 12.13 (LibreTexts ed., 2021), https://bio.libretexts.org/Courses/Lumen_Learning/Biology_for_Majors_II_(Lumen)/12%3A_Module_9-_Plant_Reproduction/12.13%3A_Self-Pollination_and_Cross-Pollination [https://perma.cc/2HZT-HCWJ].

72. *Id*.

73. *See Bee-cause It Matters*, *supra* note 66. Again, the direct threat of such cross-pollination is the loss of organic statute, and this Note argues that loss of status could form the basis of a tort claim.

the regime can better adapt.[74] Across publications, scholars accept that pollen drift is "an entirely natural and expected process" that is an "inevitable consequence" of growing a pollinating crop.[75] As the scholars analyze the most likely claims, some common threads of issues for each are prevalent: (1) intent and causation are arguably difficult to establish for trespass claims,[76] and (2) the reasonableness of the defendant's actions are difficult to establish for a nuisance or negligence claim.[77] Each article offers helpful argumentative comparison on how the tort regime is lacking for this issue, but, unlike this Note, none offer recommendations in support of the GMO farmer.[78]

2. Additional Context Through Federal Regulatory Landscape on GMOs

Although silent on tort liability, the regulatory landscape supports the continued production of GMOs by appointing federal agencies to oversee their growth and development while notably avoiding implementing any legislation that would burden or inhibit their production.[79] GMOs are monitored for their impact on humans, animals, and the environment primarily through three federal agencies: the Food and Drug Administration ("FDA"), the U.S. Environmental Protection Agency ("EPA"), and the U.S. Department of Agriculture ("USDA").[80] Regarding their distribution, farmers selling GMOs must abide by the multitude of regulations to legally sell their crops in commerce.[81] Congress delegated federal regulatory authority of BE crops to Animal and Plant Health Inspection Service ("APHIS"), a branch of the Department of Agriculture, through the Plant Protection Act ("PPA").[82] However, the regulatory scheme does not address tort liability, as it speaks mostly to labeling requirements or permits for the patented GM sequences

74. *See, e.g.*, Endres & Schlessinger, *supra* note 21; Austin Glascoe, *Genetically Modified Nuisance: Your Right to Recovery Is Barred, If You Catch My Drift*, 6 LSU J. ENERGY L. & RES. 533, 551–54 (2018); Carpenter, Jr., *supra* note 21.

75. Endres & Schlessinger, *supra* note 21, at 832, 840.

76. *Id.* at 831–33.

77. *Id.* at 837–41; Carpenter, Jr., *supra* note 21, at 85–88.

78. *See* sources cited *supra* note 74.

79. *See* REGULATION OF BIOTECH PLANTS, *supra* note 13.

80. *See id.*

81. *See* HOW GMOS ARE REGULATED IN THE UNITED STATES, *supra* note 12.

82. *See* Plant Protection Act, 7 U.S.C. § 7701 *et seq.*; USDA, ANIMAL & PLANT HEALTH INSPECT. SERV., BIOTECHNOLOGY PERMITS, https://www.aphis.usda.gov/biotechnology-permits [https://perma.cc/TJ4K-BBFG] (Nov. 6, 2024). Federal regulation is done through APHIS's power to regulate "plant pests" with some BE crops presumed as such under PPA. *See* Monsanto Co. v. Geertson Seed Farms, 561 U.S. 139, 144–45 (2010). This presumption can be overcome by a farmer petitioning APHIS to have it determined that their BE crop "does not present a plant pest risk and therefore should not be subject to the applicable regulations." *Id.* at 145.

themselves.[83] No federal regulations preclude or hinder the growth and production of GMOs as long as the GM sequences are approved by the requisite regulatory agency standard and abide by the applicable labeling requirements.[84] The lack of federal regulation regarding tort liability from growing GMOs along with explicit regulations for organic crop production[85] indicate a public policy that supports growing GMOs without placing a burden on GMO farmers. South Carolina should consider this federal regulatory guidance when addressing tort liability allocation.

Cross-pollination results in portions of the GM sequence, transferred through an independent source, subsequently appearing in a novel population, the non-GM crops, after crop reproduction.[86] With the GM material present, the farmers must either label and market their product as a GMO to conform with the federal regulatory requirements or they are unable to sell their crop as non-GMO.[87] In certain instances, these non-GMO farmers are planning to sell to foreign countries who do not allow certain GMOs in their nation, thus rendering the crops useless for this sort of sale.[88] Additionally, organic farmers have their own set of regulations they must follow to receive the organic label on their crops,[89] so cross-pollination with GM crops ruins any chance these non-GMO farmers have to sell under such premium labeling or to command a higher organic price. Thus, plaintiffs looking to export non-GM crops and those wanting to sell their crops under an organic label are the most impacted by the issue of GMO cross-pollination.

3. South Carolina Statutory and Regulatory Guidance on GMOs

In South Carolina, there are no specific regulations speaking to tort liability for growing GMOs,[90] and the state offers only a single statutory

83. *See* REGULATION OF BIOTECH PLANTS, *supra* note 13.

84. *See id.*; *cf. GM Approval Database*, INT'L SERV. FOR THE ACQUISITION OF AGRI-BIOTECH APPLICATIONS, https://www.isaaa.org/gmapprovaldatabase/ [https://perma.cc/6YKR-5Z8T] (providing a database of biotech/GM crop approvals, explaining that, from country to country, "all regulations are based on the same objective that each GM crop is safe for human or animal health and the environment").

85. *See* 7 C.F.R. § 205.400 (2024); 7 U.S.C. § 1639b(b); 7 U.S.C. § 7734.

86. *See Bee-cause It Matters*, *supra* note 66.

87. *See* BIOENGINEERED, *supra* note 41.

88. *See In re* Syngenta AG MIR 162 Corn Litig., 131 F.Supp.3d 1177, 1186 (D. Kan. 2015) (explaining that Syngenta developed products for import into China, who "began rejecting all corn from the United States containing MIR 162 trait").

89. *See* 7 C.F.R. § 205.400 ("General requirements for certification"); *see also* 7 U.S.C. § 1639b(b).

90. *See generally* S.C. CODE ANN. §§ 46-9-10 to -120 (providing statutory framework for State Crop Pest Commission). *Cf.* Angie Culler-Matthews, S.C. DEP'T OF AGRIC., WHOLESALE

definition of the term.[91] The existence of this legislative act could indicate that the state considered such organisms and chose to remain silent on imposing any tort liability for their growth and production. The relevant statute defines a "genetically engineered organism" as an "organism altered or produced through genetic modification from a donor, vector, or recipient organism using recombinant DNA techniques."[92] Breaking this language down in scientific terms, "genetic modification" is a modification to the organism's DNA sequencing through biotechnology.[93] The "donor" organism is the organism providing the target sequence while the "recipient" organism is the organism receiving the target sequence.[94] To facilitate this delivery, the "vector" acts as a vessel to transport and deliver the target sequence from the donor into the recipient.[95] "Recombinant DNA techniques" are techniques involving the utilization of genetic material that contains DNA fragments from two or more different organisms.[96] While the statutory language may be slightly confusing when read for scientific precision, the statute can be rearranged for clarity: a "genetically engineered organism" is any organism created or altered to contain DNA fragments from a donor organism to a recipient organism through vector delivery. When this process of genetic drift occurs, the traditional, non-GMO farmers wanting to produce non-GM crops now have crops that fit under the state's statutory definition of GMOs. Thus, any of the crops described in the cases below also fall within what South Carolina considers a GMO.

FOOD SAFETY, https://agriculture.sc.gov/divisions/consumer-protection/food-safety-compliance/ [https://perma.cc/5LK6-RCTG] (detailing simply regulatory oversight work of the Wholesale Food Safety Department).

91. *See* S.C. CODE ANN. § 46-9-15(4).

92. *Id.*

93. *See* SMITH, *supra* note 38 ("GMO . . . is a plant, animal or microbe in which one or more changes have been made to the genome, typically using high-tech genetic engineering, in an attempt to alter the characteristics of an organism.").

94. *See* John A. Beardmore & Joanne S. Porter, *Nature of GMOs*, *in* GENETICALLY MODIFIED ORGANISMS AND AQUACULTURE (2003), https://www.fao.org/4/y4955e/y4955e03.htm [https://perma.cc/LT4E-MAX5]; *see also What is Genetic Engineering and How Does It Work?*, AG BIOSAFETY, https://agbiosafety.unl.edu/basic_genetics.shtml [https://perma.cc/3NU5-K3RD] ("When a gene for a desirable trait is taken from one organism and inserted into another, it gives the 'recipient' organism the ability to express that same trait.").

95. Vectors are living modes of delivery that transport target segments of DNA into another organism. CHARLES P. VENDITTI, NAT'L HUM. GENOME RSCH. INST., VECTOR, https://www.genome.gov/genetics-glossary/Vector [https://perma.cc/J9LZ-FE3D] (Jan. 24, 2025).

96. Walter Suza, et al., *Recombinant DNA Technology*, *in* GENETICS, AGRICULTURE, AND BIOTECHNOLOGY 109 (2021).

4. Federal Public Policy Generally Supports GMOs

Federal legislation also generally supports the growth and production of GMOs: the stated goal of the three regulatory agencies tasked with overseeing GMO production is to ensure their safety for human consumption, not to limit their production and sale.[97] Specifically, federal statutes such as the National Bioengineered Food Disclosure Standard explicitly disallow for labels to include any indication that GMOs are any more or less safe than their non-GMO counterpart.[98] Such labeling restrictions align with the "substantial equivalence" standard, a standard which recognizes GMOs as functionally equivalent to their non-GMO counterparts in terms of safety for consumption.[99] Further, the FDA's voluntary "Plant Biotechnology Consultation Program" monitors any newly developed GMOs to ensure their compliance with the set health and safety standards before allowing the product into the public market.[100] As for members of the public who argue GMOs are inherently unsafe due to the requisite human aid for their creation, regulations and statutes require transparent labeling to account for consumer preference. Even so, the scheme is set to allow for GMO's continued production.[101] Both the statutory disclosure standard and the FDA's consultation program offer evidence of federal support for GMO production, with the main policy concern being their safety for consumption, not the prevention or restriction of their use.

Multiple federal statutes support the regulatory scheme that farmers must adhere to in GMO growth and production of such products from seed to consumer sale.[102] The production of BE foods and GMOs in the United States is protected by these regulations and statutes which preempt state ordinances.[103] While these statutes evidence federal legislative support for GMO production, some states have tried to enact local legislation in direct

97. *See* HOW GMOS ARE REGULATED IN THE UNITED STATES, *supra* note 12 (The FDA, EPA, and USDA "ensure that GMOs are safe for human, plant, and animal health").

98. 7 U.S.C. §§ 1639(b), (e).

99. *See* Andrew Porterfield & Jon Entine, *'Substantial Equivalence': Are GMOs as Safe as Other Conventional and Organic Foods?*, GENETIC LITERACY PROJECT (May 11, 2018), https://geneticliteracyproject.org/2018/05/11/substantial-equivalence-are-gmos-as-safe-as-other-conventional-organic-foods/ [https://perma.cc/QAX2-QZ55].

100. FDA, PROGRAMS ON FOODS FROM NEW PLANT VARIETIES, https://www.fda.gov/food/food-new-plant-varieties/programs-food-new-plant-varieties#plant [https://perma.cc/7KSU-FH9U] (Dec. 16, 2024).

101. *See* 7 C.F.R. § 66.102 (2024).

102. *See* Plant Protection Act, 7 U.S.C. § 7701 *et seq.*

103. *See* 7 U.S.C. § 7756(b).

opposition of the federal view.[104] For example, Hawaii County tried to enact local ordinances regulating or banning GMO production for the stated purpose of "preserv[ing] Hawaii Island's vulnerable ecosystem . . . [and] 'promoting the cultural heritage of indigenous agricultural practices,'"[105] but such ordinances were found to be federally preempted by the PPA.[106] Instead of interfering with the growth and production of these crops through state legislation, many different mitigation methods are available for non-GMO farmers. Utilizing the available methods helps minimize the risk of cross-pollination and offers a solution that supports this public policy of continued GMO production[107] while incorporating consumer choice through mandated transparent labeling.[108] The multitude of health benefits to consumers and the array of economic benefits to farmers warrant aligning South Carolina's approach to tort liability with established scientific principles and pro-GMO public policy,[109] and the lack of any negative federal legislative interference with GMO production implies federal support for this position.[110]

III. SCIENCE IS THE CRUX OF THE ARGUMENT: GMO FARMERS SHOULD NOT FACE TORT LIABILITY

South Carolina courts, along with the rest of the United States, have yet to address the issue for any tort-based theory involving GMO cross-pollination brought by a non-GMO or an organic farmer against their neighboring GMO farmer.[111] Thus, the state is in a position to build its own precedent that grounds itself in science while looking to other jurisdictions for guidance on the same legal issues presented under similar factual scenarios. Take one science-backed analogy as an analytical guide: cross-pollination of GM crops is perhaps more like the spread of a biotic source such as a virus.

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104. *See, e.g.*, Haw. Papaya Indus. Ass'n v. County of Hawaii, 666 Fed. App'x 631, 633 (9th Cir. 2016); Robert Ito Farm, Inc. v. County of Maui, 111 F.Supp.3d 1088, 1093 (D. Haw. 2015).

105. *Haw. Papaya Indus. Ass'n*, 666 Fed. App'x at 633. Specifically, plaintiffs challenged an ordinance that banned "open air testing of genetically engineered organisms of any kind' and "open air cultivation, propagation, development, or testing of genetically engineered crops or plants" arguing the ordinance was preempted by both federal law and state law. *Id.*

106. *Id.* The Ninth Circuit additionally agreed with plaintiffs on their state preemption claim, holding that the ordinance was also impliedly preempted by state law. *Id.* at 633–34.

107. *See infra* Section III.d.iii.

108. Federal law already requires that "[i]ngredients and foods that meet the definition of bioengineered . . . include a disclosure on the package or label." *See* BIOENGINEERED, *supra* note 41.

109. *See infra* Section III.D.ii.

110. *See infra* Section III.D.i.

111. The hypothetical plaintiff is an organic or non-GMO farmer for the purposes of this analysis.

On this point, the Kansas Court of Appeals in *Krug v. Koriel* refused to speak on the issue of a landowner's duty to control viral matter absent legislative or regulatory guidance.[112] In that case, a landowner brought suit against his neighbor when wheat streak mosaic virus[113] from the neighbor's volunteer wheat[114] contaminated his own wheat, leading to infection and subsequent crop loss.[115] At the summary judgment stage, the plaintiff was unable to point to any relevant authority to support the imposition of a duty on the defendant to control volunteer wheat growing on his land.[116] On the causation point, the plaintiff cited a decision which stated that, "when windborne materials occasion a loss, the loss is considered the direct result of a windstorm" as the storm "is considered the dominant, efficient cause…."[117] Noting that the alleged injury was indisputably caused by wind drift of the viral matter, the court sided with the defendant, holding a landowner has no legal duty "to control volunteer wheat for the purpose of preventing outbreaks of wheat streak mosaic."[118] Taken broadly, this case offers an example of courts impliedly acknowledging the inevitability of a natural scientific occurrence as enough to preclude imposing tort liability absent any explicit legislative or regulatory instruction. Following this approach would allow South Carolina to acknowledge the intersection of science and the law and avoid discrepancies between accepted scientific and legal principles.

With no case law on genetic drift between neighboring farmers, other jurisdictions offer instructive reasonings on slightly different facts but under the same likely tort claims that allow for comparison. As Professors Endres and Schlessinger discuss, three likely causes of action in tort to be brought against a GMO farmer for genetic drift are trespass, nuisance, and negligence.[119] As to each claim, this Note argues against (1) the satisfaction of intent for a trespass or nuisance claim, (2) the recognition of causation for a trespass or nuisance claim, and (3) the imposition of a legal duty on GMO farmers under a negligence claim. Although less factually analogous to GMO

112. 935 P.2d 1063, 1067 (Kan. Ct. App. 1997).

113. Wheat streak mosaic virus is a common plant disease that causes severe crop loss once infection occurs. *Wheat & Small Grains*, WASH. STATE UNIV., https://smallgrains.wsu.edu/disease-resources/virus-diseases/wheat-streak-mosaic/ [https://perma.cc/N35T-E55B].

114. Volunteer wheat is an unintentional growth of wheat that typically appears where past wheat crops were grown and occurs through natural reproductive processes. *Volunteer Wheat (Tritcum Aestivum)*, FARMS.COM, https://m.farms.com/field-guide/weed-management/volunteer-wheat.aspx [https://perma.cc/HD5L-SN8J].

115. *Krug*, 935 P.2d at 1064.

116. *Id.* at 1066–67.

117. *Id.* at 1065–66 (quoting Curtis O. Griess & Sons v. Farm Bureau Ins. Co. of Neb., 528 N.W.2d 329, 330 (1995)).

118. *Id.* at 1067.

119. *See* Endres & Schlessinger, *supra* note 21, at 830. The Professors also list strict liability as a fourth likely cause of action, but its discussion is beyond the scope of this Note.

genetic drift than viral spread cases, herbicide drift suits allow for a comparison as to how courts approach the intent and causation elements regarding whether a manufacturer is liable when herbicide drift occurs during its application to fields containing its GM seeds.[120] Any mitigation duties should be imposed on the non-GMO or organic farmer, as placing the burden on GMO farmers is contrary to federal public policy.[121]

Multiple cases address other jurisdictional views on whether drift of GM sequencing should amount to a legal injury.[122] In one such case confronted with this issue, *In re StarLink*, the United States District Court for the Northern District of Illinois directly stated that the plaintiff's non-GM crops developing a BE protein by cross-pollinating and comingling with the GM StarLink corn amounted to an injury.[123] In that case, the BE sequence that contaminated the plaintiff's crops—Cry9C protein—was not approved for human consumption.[124] Thus, the previously non-GM corn crop that now contained the GM sequence was rendered unfit for sale for human consumption altogether—a change found as enough to constitute a cognizable harm.[125] However, whether or not something is "injured" depends on the lens in which one views the result. Organic farmers likely view the BE sequence appearing in their crops as an injury because a substantive change has occurred that renders them unable to sell their crops under an organic label as they intended to at time of planting.[126] Most explicitly in support of this stance, the Supreme Court held cross-pollination by GM pollen is a recognizable harm such that a plaintiff satisfies the injury-in-fact prong of standing to bring suit for its occurrence.[127] In the opposition and as this Note

120. *See infra* text accompanying notes 169-178.

121. *See infra* Section III.D.ii–iii.

122. *See, e.g.*, *In re* StarLink Corn Prods. Liab. Litig., 212 F.Supp.2d 828, 841 (N.D. Ill. 2002); Monsanto Co. v. Geertson Seed Farms, 561 U.S. 139, 153–56 (2010).

123. *In re StarLink*, 212 F.Supp.2d at 841 ("Non–StarLink corn crops are damaged when they are pollinated by StarLink corn. The pollen causes these corn plants to develop the Cry9C protein and renders what would otherwise be a valuable food crop unfit for human consumption.").

124. *Id.* at 834–35.

125. *Id.* at 835.

126. *See supra* note 67 and accompanying text.

127. *Monsanto*, 561 U.S. at 155. The Court pointed to the district court's finding that the farmers in the suit had "established a 'reasonable probability' that their organic and conventional alfalfa crops will be infected with the engineered gene" in the event of deregulation of the defendant's BE alfalfa. *Id.* at 153. The Court continued by acknowledging a "risk of gene flow injures [farmers] in several ways," including the respondent's allegations that such risk imposed the burden of having to conduct genetic testing to determine crop contamination along with the burden of taking precautions to help mitigate the potential of contamination between non-BE and BE alfalfa. *Id.* at 153–54. Although the Court acknowledged these allegations, even in the event cross-contamination did not actually occur, it was still enough to constitute an injury in its

supports, GMO farmers can argue the crops, though different, are not injured in any way other than the economic loss of profit from the difference between organic labeling and the loss of that label. Indeed, South Carolina courts should not consider this economic harm as a legally recognizable injury and should not overexpand the satisfaction of intent and causation such that GMO farmers are exposed to tort liability.

Further, while the farmers bringing suit likely suffer an economic harm with the loss of organic or non-GMO status arguably being a "detriment in fact," this harm should not amount to a legal injury as there is no tortious conduct on the part of the GMO farmer invading "a legally protected interest."[128] With no harm apart from economic, the non-GMO plaintiff's claim should not survive South Carolina's economic loss rule which, as one jurisprudence summary provides, is "a standard limiting recovery in negligence cases for injury affecting property [that] . . . has eliminated from tort claims any recovery for loss of the expected bargain from the base transaction or for damage to the property purchased."[129] In other words, non-GMO plaintiffs cannot recover for the loss in price difference of the labels alone, i.e., "for [the] loss of the expected bargain."[130] However, one jurisdiction already stated that contamination by GM material in some factual scenarios can constitute a physical injury to one's property, thus surviving the doctrine.[131] Accordingly, despite a strong justification for the only loss being economic, addressing how each claim plays out in the case it survives the doctrine is still relevant. The basis for this Note's arguments is rooted in science, with the inherent inevitability and biological necessity of cross-pollination along with the variety of economic and health benefits offered by GM crops demanding judicial support of their production. As summarized by one scholar, "nothing can prevent the inevitable," and allowing for successful tort claims on these facts consequently opens GMO farmers up to a pandora's box of tort liabilities.[132]

A. Overview of South Carolina's Tort Regime

Three main causes of action are likely to arise in the case of drifting GM pollen from neighboring fields resulting in cross-pollination of GM and non-

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constitutional standing analysis. *Id.* at 155. This determination indicates the Court would also likely find cross-contamination to be a legal injury such that a plaintiff could recover under tort law.

128. *See* RESTATEMENT (SECOND) OF TORTS § 7 (AM. L. INST. 1965).

129. 7 S.C. JURIS. ARCHITECTS & ENG'RS § 31.

130. *Id.*

131. *See In re* StarLink Corn Prods. Liab. Litig., 212 F.Supp.2d 828, 842–43 (N.D. Ill. 2002).

132. Glascoe, *supra* note 74, at 533.

GM crops: plaintiffs could bring trespass, nuisance, and negligence claims against their neighbors for drifting GM pollen. These tort causes of action offer non-GMO farmers the highest chance for recovery, as courts in other jurisdictions have recognized or at least implied that drifting pollen constitutes a legally recognizable injury.[133] In general, South Carolina trespass claims require an intentional, affirmative act that directly led to an injury,[134] nuisance claims require an unreasonable act on the part of the defendant that caused an invasion of the landowner's right to the "private use and enjoyment of [his] land,"[135] and negligence claims require the defendant's breach of a legally owed duty that actually and proximately caused the plaintiff's injury.[136] Trespass claims require satisfaction of both an intent and a causation element[137] while nuisance claims look for unreasonable behavior and causation for the plaintiff to succeed,[138] both of which leave room for argument under the ill-fitting current tort regime.

However, this Note argues that a GMO farmer's intent to plant a GM crop should not be enough to constitute intent for the subsequent genetic drift[139] just as their growing a GM crop is not unreasonable behavior.[140] Looking to the causation element of all three claims, the drifting GM sequence likely does originate from the neighboring GM crop's field, but the argument lies in the attenuated nature and time delay before the alleged injury occurs.[141] Thus, under each of the three probable claims, the GMO farmer should not be liable for their crop's drifting pollen because they did not commit any intentional act, display any unreasonable behavior, or breach any owed duty that caused an injury other than an economic harm. To elaborate on these arguments, each tort's relevant element is addressed in the chronological order of events for this factual scenario, starting with the GMO farmer planting the GM seed for a trespass or nuisance claim, then addressing the causation element relevant after pollen drift occurs, and finally looking to mitigation duties and public policy rationales to overcome a negligence claim.

133. *See, e.g.*, *In re StarLink*, 212 F.Supp.2d at 841; Monsanto Co. v. Geertson Seed Farms, 561 U.S. 139, 153–54 (2010).

134. Snow v. City of Columbia, 305 S.C. 544, 553, 409 S.E.2d 797, 802 (S.C. Ct. App. 1991).

135. Babb v. Lee Cnty. Landfill, 405 S.C. 129, 139, 747 S.E.2d 468, 473 (2013).

136. Vinson v. Hartley, 324 S.C. 389, 399, 477 S.E.2d 715, 720 (S.C. Ct. App. 1996).

137. *See* Johnston v. Anderson Reg'l Landfill, 725 F.Supp.3d 527, 538–39 (D.S.C. 2024) (collecting South Carolina cases).

138. *Babb*, 405 S.C. at 145, 747 S.E.2d at 476.

139. *See infra* Section III.b.i.

140. *See infra* Section III.b.ii.

141. *See infra* Section III.c.i.

B. Planting a GM Seed is Not Enough to Satisfy the Intent or Unreasonable Act Elements

1. Intent of a Trespass Claim

Under a trespass claim, the most difficult element to establish for this factual scenario is intent, largely due to varying arguments as to the relevant time period in which to analyze the GMO farmer's actions.[142] In this factual scenario, the drifting pollen constitutes the invasion of land, and the GMO farmer's relevant intentional acts are likely either the planting of the GM seed or the general act of growing a cross-pollinating GM crop.[143] Organic or non-GMO farmers are likely to argue, and as other scholars support,[144] that the intentional act of planting the GM seed coupled with the accepted reality that cross-pollination is bound to occur is enough to satisfy intent of a trespass claim. However, courts have ruled against such a conclusion in analogous circumstances.[145] Simply put, the intent element should fail under either one of the farmer's actions: allowing satisfaction of the intent element by the simple act of planting a GMO is too broad, while satisfaction of the intent element for the general growing of a cross-pollinating crop is illogical due to the lack of control over the mechanism of transfer and significant time delay in alleged injury.

South Carolina courts require plaintiffs looking to recover under the theory of trespass to show that "the defendant 'took an affirmative act,' that 'the invasion of the land [was] intentional,' and that 'the harm caused [was] the direct result of that invasion.'"[146] In explaining the element of intent, South Carolina courts explain that the defendant "must intend the act which constitutes the unwarranted entry on another's land."[147] Specifically, South Carolina courts explicate the defendant's intent need not be directed towards the consequence, but rather they must only intend the affirmative act that leads to the inevitable invasion of land.[148] Thus, in the GMO context, the GMO farmer must act affirmatively with the intent to cause the invasion of the particulate which causes the injury—i.e., the pollen—but the argument lies in which of the GMO farmer's affirmative acts is relevant in this intent inquiry.

In the absence of case law speaking directly to this point, other scholars look at the GMO farmer's intent at the time of planting and intent at the time

142. *See* Endres & Schlessinger, *supra* note 21, at 831–33.

143. *See id.* at 832.

144. *See, e.g.*, *id.*

145. *See, e.g.*, *In re* Dicamba Herbicides Litig., 359 F.Supp.3d 711, 728 (E.D. Mo. 2019).

146. Snow v. City of Columbia, 305 S.C. 544, 553, 409 S.E.2d 797, 802 (S.C. Ct. App. 1991) (alterations in original).

147. *Id.*

148. *Id.*

of cross-pollination as two relevant time periods to analyze the farmer's actions. Professors Endres and Schlessinger argue the intent to plant the GMO with the general knowledge of cross-pollination in certain crops known to have heavy pollen shed is likely enough to satisfy the element, regardless of the lack of specific intent to cause the invasion itself.[149] In other words, the Professors align with South Carolina courts' general approach to intent, stating that the GMO farmer must only act with the intent to plant the GM seed—not with the intent to cause invasion by cross-pollination.[150] Thus, the court and the Professors indicate that the act of planting the GM seed that subsequently and expectedly caused the alleged harm is enough for the element's satisfaction.[151]

However, Endres and Schlessinger note a counterargument in another publication posed by Professors Heald and Smith that better accommodates the science behind crop reproduction.[152] Heald and Smith argue that the attenuated nature of pollination due to interference by independent forces along with the time delay in injury from the crop's reproductive cycle are major enough issues such that the claim's requisite directness and immediacy from the intentional act to the alleged injury are not satisfied.[153] Further, another commentator notes that courts "may be hesitant to [extend] trespass liability" due to pollen drift being "a natural phenomenon."[154] Even though GMO farmers can take mitigation measures to help decrease pollen drift,[155] total prevention of cross-pollination in open-air fields with compatible crops within drifting distance is scientifically impossible due to the number of uncontrollable modes of spore delivery.[156] Both the reasonings offered by Heald and Smith[157] and the acknowledgement that cross-pollination is "a natural phenomenon"[158] are backed by indisputable scientific principles that all support evaluating the GMO farmer's intent only at the time of planting the GM seed rather than for the indiscriminate cross-pollination period.[159] However, as Heald and Smith imply—and in direct opposition of Endres and

149. *See* Endres & Schlessinger*, supra* note 21, at 831–32.

150. *Id.*

151. *Id.*; *see Snow*, 305 S.C. at 553, 409 S.E.2d at 802 ("Intent is proved by showing that the defendant acted voluntarily and that he knew or should have known the result would follow from his act," regardless of whether he "intend[ed] or expect[ed] the damaged consequence . . . .").

152. *See* Endres & Schlessinger, *supra* note 21, at 831.

153. *See* Paul J. Heald & James Charles Smith, *The Problem of Social Cost in a Genetically Modified Age*, 58 HASTINGS L.J. 87, 135 (2006).

154. Carpenter, Jr., *supra* note 21, at 79–80.

155. *See* discussion *infra* text accompanying notes 265-274.

156. *See Bee-cause It Matters*, *supra* note 66.

157. *See* Endres & Schlessinger, *supra* note 21, at 831.

158. Carpenter, Jr., *supra* note 21, at 79–80.

159. *See infra* text accompanying notes 161-168.

Schlessinger's point—such intent should not be held as satisfactory just because cross-pollination is an expected occurrence from planting, as doing so is inconsistent with the scientific necessity and inevitability of crop reproduction.[160]

Further, under this factual scenario, the risk of the alleged injury exists regardless of whether the farmer employs mitigation measures because cross-pollination is both a required and expected occurrence of crop reproduction in an open-air field.[161] For example, *Bt* corn is a commonly grown GM flowering crop that produces pollen spores as part of its reproductive cycle that go on to pollinate with other compatible corn stalks.[162] Cross-pollination in flowering plants is when the genetic material from one plant is transferred to another via its "sperm-laden pollen grains" pollinating with the "egg-bearing" parts of another sexually compatible plant.[163] The pollen is delivered through vectors, organisms which carry the pollen from one crop to another, or through abiotic factors like the wind or rain.[164] This process is how plants reproduce naturally, but, in the context of GMOs, it is also the main mechanism through which cross-pollination of GM material occurs.[165] Thus, in this context, the sexually-compatible non-GM corn stalk is fertilized by the GM corn's drifting pollen spores, resulting in a new corn stalk that now contains a GM sequence.

Looking at corn as an example of a flowering crop, just one "corn plant can produce 2 to 5 million pollen grains" that can "travel more than 500 feet," though most only travel between "20 to 50 feet."[166] All these pollen spores floating around in open-air fields are free for uncontrollable actors like the wind or bumblebees to carry the BE pollen spores to neighboring farms. Farmers growing crops in an open-air field cannot control the wind or

160. *See* Endres & Schlessinger, *supra* note 21, at 831–32; *see also* Heald & Smith, *supra* note 153, at 135–38 (agreeing with Heald and Smith's argument but in opposition of Endres and Schlessinger's point).

161. *See Bee-cause It Matters*, *supra* note 66.

162. *See* R.L. (Bob) Nielson, *Minimizing Pollen Drift & Commingling of GMO and Non-GMO Corn Grain*, CORNY NEWS NETWORK (Mar. 2000), https://www.agry.purdue.edu/ext/corn/news/articles.00/gmo_issues-000307.html [https://perma.cc/PJT9-26G9].

163. *Cross-Pollination*, *supra* note 70.

164. *See* FOREST SERV: USDA, *WHAT IS POLLINATION?*, https://www.fs.usda.gov/managing-land/wildflowers/pollinators/what-is-pollination [https://perma.cc/7VRX-5LVK] ("[V]ectors can include wind, water, birds, insects, butterflies, bats, and other animals that visit flowers."). Specifically, research shows wind is one mechanism of gene flow in open-air plants. *See generally* Matthew M. Kling & David D. Ackerly, *Global Wind Patterns Shape Genetic Differentiation, Asymmetric Gene Flow, and Genetic Diversity in Trees*, PROCEEDINGS OF NAT'L ACAD. SCIS., Mar. 17, 2021, at 1.

165. *See Bee-cause It Matters*, *supra* note 66.

166. Mark Licht & Zachary Clemens, *The Birds and Bees of Corn Pollination*, IOWA STATE UNIV. EXTENSION & OUTREACH (July 19, 2021, 4:20 PM), https://crops.extension.iastate.edu/blog/mark-licht-zachary-clemens/birds-and-bees-corn-pollination [https://perma.cc/PU9M-4WRP].

bumblebees, and the crops need pollinator species for their normal growth and development.[167] Crops need to pollinate to reproduce, and cross-pollination is one main natural mechanism of genetic diversity in a plant species.[168] Holding farmers liable for the result of cross-pollination implicitly asks them to keep the BE material on their land and to negatively interfere with the natural growth and reproduction of their crops. Thus, having the simple act of planting the GM seed with the knowledge of pollen drift as enough to satisfy intent illogically exposes GMO farmers to liability for ordinary and agronomically necessary events occurring throughout their crop's natural reproductive cycle.

Comparison with an herbicide drift case is again instructive to show the distinction in what acts should constitute satisfaction of intent by the GMO farmer. In the *In re Dicamba* multidistrict litigation, the Eastern District of Missouri addressed the plaintiff's allegations that their soybean crops were damaged by herbicide drift when neighboring farmers planted the defendant's GM seeds, which were modified to contain herbicide resistance to the herbicide Dicamba, and subsequently sprayed such crops with the chemical.[169] The court's reasoning implied that the mechanical application of herbicide onto GM crops drifting over property lines constituted the physical invasion of neighboring land.[170] When analyzing the trespass claim, the court pointed to two other decisions—*Syngenta* and *City of Bloomingdale*—refusing to impose liability on manufacturers for damage caused in relation to their GM products.[171] The court reviewed *Syngenta*'s holding that the manufacturer having knowledge that "contamination would occur when its seed product was used as intended" still did not rise to the requisite intent for a trespass claim because the defendant no longer had control over the seeds.[172] Next, the court looked to *City of Bloomingdale*'s holding that the manufacturer was not liable for trespass when it no longer possessed the product because it "did not cause the trespass 'by command, request, or physical duress,'" thus lacking the requisite intent at the time the invasion occurred.[173] With these two decisions in mind, the court determined the plaintiff's trespass theory fails due to the product no longer remaining in the control of the defendant manufacturer when the alleged injury occurred.[174]

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167. *See Cross-Pollination*, *supra* note 70.

168. *See id*.

169. *In re* Dicamba Herbicides Litig., 359 F.Supp.3d 711, 718–19 (E.D. Mo. 2019).

170. *See id.* at 727–28 (The court instead focused its analysis on whether it would extend trespass liability—specifically the satisfaction of intent—to the manufacturer of a product when such product "winds up on the property of another" after it leaves the manufacturer's control).

171. *Id.* at 728.

172. *Id.* (citing *In re* Syngenta AG MIR 162 Corn Litig., 131 F.Supp.3d 1177, 1210–11 (D. Kan. 2015)).

173. *Id.* (quoting City of Bloomington v. Westinghouse Elec. Corp., 891 F.2d 611, 615 (7th Cir. 1989)).

174. *See id.*

Although the court in *Dicamba* looked at liability for manufacturers, the two rationales it utilized offer guidance for this scenario as well. GMO farmers, like the manufacturers in *Dicamba*, also "kn[o]w contamination [will] occur" when they plant their crops due to the inevitability of cross-pollination.[175] Moreover, once the GM seeds are planted, the farmers no longer retain control over the matter expelled from the crops during their natural growing process.[176] Under the *Syngenta* court's reasoning, the farmer's lack of control over the drifting GM pollen, despite them knowing "contamination [will] occur," prevents them from having the requisite intent to cause the invasion.[177] Further, under the *City of Bloomingdale* court's reasoning, the farmers again do not satisfy the intent element because they did not "command" the drifting pollen to invade the neighbor's land.[178] Rather, under both reasonings, the mechanical application of herbicide is arguably more likely to constitute the invasion by "command" due to the higher degree of control in location and placement the sprayers have over the particulate matter causing the invasion. Thus, the lack of affirmative act on the part of the GMO farmer contrasting that of the mechanical application of an herbicide sprayer further supports that the simple act of planting a GM crop should not amount to the requisite intent of a trespass claim.

2. Unreasonable Behavior of a Nuisance Claim

The more relaxed nature of a nuisance claim—as nuisance generally requires only unreasonable behavior by the defendant and not intent—makes it much more likely for a non-GMO farmer to recover under this theory than under trespass or negligence.[179] Nuisance occurs when one substantially and unreasonably invades another's right to the free use and enjoyment of their property.[180] However, non-GMO farmers should not prevail on such claims either, as the behavior of growing a cross-pollinating GM crop should not rise to the level of substantially and unreasonably interfering with the non-GMO farmer's right to the use and enjoyment of his land. In analyzing such facts under a nuisance claim, Endres and Schlessinger note the court's employment of a "relative sensitivity" analysis where it looks at the reasonableness of how the plaintiff is using their own land in determining if the defendant's behavior rises to the level of unreasonable.[181] In the case of GMO farmers and organic farmers, the GMO farmers can point to organic farmers as unusually sensitive

175. *Id*.
176. *Id*.
177. *See id.*
178. *Id.*
179. *See* Endres & Schlessinger, *supra* note 21, at 836.
180. Babb v. Lee Cnty. Landfill, 405 S.C. 129, 145, 747 S.E.2d 468, 476 (2013).
181. *See* Endres & Schlessinger, *supra* note 21, at 837–38.

plaintiffs, thus indicating his own behavior of growing cross-pollinating GM crops is perfectly reasonable. Further, the GMO farmer can argue that, at a minimum, growing GMOs is no more of an unusual sensitivity than growing non-GMO or organic crops, and the court holding to the contrary infringes on his right to the free use and enjoyment of his own land. Thus, the GMO farmer can utilize this relative sensitivity argument to bolster the reasonableness of his own behavior in growing GM crops such that he should not be liable under nuisance law.

Under South Carolina law, courts have referenced the Restatement (Second) of Torts to further define nuisance as regarding a land's use by protecting one's interest in "freedom from annoyance and discomfort in the use of land," with such interests including "pleasure, comfort and enjoyment that a person normally derives" from their land.[182] Within nuisance, there are two categories of claims: private nuisance claims and public nuisance claims.[183] Public nuisance claims involve the plaintiff alleging that an "act[] or condition[] [is] subversive of public order, decency, or morals or constitute[s] an obstruction of public rights[,]" with "such nuisances always aris[ing] out of unlawful acts."[184] Because the acts here are lawful, and because the focus is on private land rather than the effect on the general public, non-GMO farmers are likely not able to recover under public nuisance.[185] Private nuisance is the most applicable,[186] and South Carolina defines a private nuisance as "unreasonable, unwarrantable, or unlawful use by a person of his own property, personal or real."[187]

Courts have extended substantial and unreasonable behavior to include behavior that "hurts, inconveniences, or damages" the neighbor's rights while determining if the act constitutes a nuisance by balancing the property rights of each individual landowner.[188] Specifically, courts employ a balancing test of the right to free use and enjoyment of each landowner before determining if the defendant's actions amount to a nuisance.[189] However, in this balancing test under these facts, each farmer likely argues different sides of the same coin: GMO farmers point to the right to use their land to grow GM crops

182. *See, e.g.*, *Babb*, 405 S.C. at 139, 747 S.E.2d at 473 (citing RESTATEMENT (SECOND) OF TORTS § 821D (AM. L. INST. 1979)).

183. *See* State v. Turner, 198 S.C. 487, 496, 18 S.E.2d 372, 375 (1942).

184. *Id.*

185. *See id.*

186. *See* Endres & Schlessinger, *supra* note 21, at 835.

187. O'Cain v. O'Cain, 322 S.C. 551, 561, 473 S.E.2d 460, 466 (S.C. Ct. App. 1996) (citing Clark v. Greenville County, 313 S.C. 205, 209, 437 S.E.2d 117, 119 (1993)).

188. *See, e.g.*, *id.* at 562, 473 S.E.2d at 466 (citing Strong v. Winn-Dixie Stores, Inc., 240 S.C. 244, 252, 125 S.E.2d 628, 632 (1962)).

189. *See, e.g.*, Babb v. Lee Cnty. Landfill, 405 S.C. 129, 139–44, 747 S.E.2d 468, 473–75 (2013) (applying an un-stated balancing test between these two factors and detailing other courts that have done the same).

despite the risk of natural cross-pollination while non-GMO or organic farmers argue the risk of cross-pollination by GM material invades their right to grow certified non-GM crops on their own land.

Other jurisdictions speak directly to the issue of drifting pollen containing BE sequencing as enough to constitute a claim for nuisance.[190] In *In re StarLink*, the Northern District of Illinois agreed that "drifting pollen can constitute an invasion, and that contaminating neighbors' crops interferes with their enjoyment of the land."[191] The plaintiffs in that multidistrict litigation were a group of farmers alleging that the defendant's BE corn seeds, altered to express a protein that acts as an insecticide and renders the corn unfit for human consumption, led to the U.S. corn supply experiencing widespread contamination as a result of failed precautionary measures by defendant StarLink.[192] When analyzing the plaintiff's nuisance claims, the court explicitly stated that "[r]esidue from a product drifting across property lines presents a typical nuisance claim."[193] Further, the court extended such liability to "all parties who substantially contribute to the nuisance," thus finding the plaintiffs had "a valid claim for private nuisance" against the manufacturer defendants beyond the point of sale.[194] In reaching this holding, the court pointed out that the plaintiffs were not the purchasers of the source of the nuisance and had no ability to control the products entering their property.[195]

Under this framework, the farmers planting the GM crops are likely to be considered a substantial contributor to the drifting pollen since they are the ones growing the crops, but some of the factors the court utilized in its reasoning[196] can—and should—easily come out the other way in South Carolina. Specifically looking at the argument that the neighbors have no control over the alleged nuisance, the GMO farmers have no more control over their drifting pollen than the non-GMO farmers have over their own crop's pollen.[197] Further, the organic farmers are arguably more likely to qualify as an unusually sensitive plaintiff, as organic crops have to comply with a multitude of regulations and can lose organic certification in a variety of ways[198] while GMOs are more of the industry norm.[199]

190. *See In re* StarLink Corn Prods. Liab. Litig., 212 F.Supp.2d 828, 845 (N.D. Ill. 2022).
191. *Id.*
192. *Id.* at 834–35.
193. *Id.* at 847.
194. *Id.*
195. *Id.* at 846.
196. *Id.* at 846–47.
197. *See infra* Section III.d.iii.
198. *See Organic and GMOs*, ORGANIC TRADE ASS'N, https://ota.com/organic-101/organic-gmos [https://perma.cc/T76X-JJZ4].
199. GMO CROPS, ANIMAL FOOD, AND BEYOND, *supra* note 8 ("It is very likely you are eating foods and food products that are made with ingredients that come from GMO crops.").

On this point, the South Carolina Court of Appeals held in *O'Cain v. O'Cain* that, even if the alleged nuisance is proper land use and a "legitimate business," the plaintiff succeeds on a nuisance suit if "[a] person of ordinary tastes and susceptibilities would clearly find such a situation objectionable."[200] In that case, the defendant placed hogs on a small strip of his land in between his land and the plaintiff's home such that the pungent odor and flies drifted over onto the plaintiff's property.[201] In coming to its conclusion that the defendant acted unreasonably, the court points to the defendant having "more suitable land in the area" that could be used to raise the hogs as well as noting that the plaintiff's reaction was not that of "an overly sensitive person."[202] Applying this reasoning to a genetic drift nuisance claim, the GMO farmers are utilizing their land in a perfectly appropriate manner—growing crops on agricultural land. Further, neighboring non-GMO farmers suing for cross-pollination is arguably the reaction of an overly sensitive person, as most farmers are likely not shocked or upset to discover their neighbor's flowering crop expelled pollen that the wind, rain, or bumblebees then carried across the land boundaries.[203] Thus, despite the plaintiff lacking control of the GM pollen as indicated by the court in *StarLink*,[204] the GMO farmer's appropriate use of his land coupled with organic or non-GMO farmers being unusually sensitive to drifting pollen spores indicates that holding the GMO farmer liable would improperly tip the scales in favor of the non-GMO farmer's right of free use and enjoyment of his land.

C. Causation Fails Because No Affirmative Act or Unreasonable Behavior Exists to Link to the Alleged Injury

1. Causation of Both a Trespass and a Nuisance

Under both trespass and nuisance claims, the alleged injury—the drifting GM sequence appearing in the novel population—is not the direct result of any affirmative act or unreasonable interference by the defendant due to the attenuated nature of the alleged injury. Explicitly, non-GMO farmer's trespass claims should fail the causation element because of their failure to satisfy

200. 322 S.C. 551, 562–63, 473 S.E.2d 460, 467 (S.C. Ct. App. 1996).

201. *Id.* at 555, 473 S.E.2d at 463.

202. *Id.* at 562–63, 473 S.E.2d at 467.

203. *See, e.g.*, Randy Gibson, *Sharing the Seed Corn with Others*, PAULS VALLEY DEMOCRAT (Sept. 11, 2024), https://www.paulsvalleydailydemocrat.com/opinion/column-sharing-the-seed-corn-with-others/article_99e84d35-aa8c-5566-bebf-2a12972acb46.html [https://perma.cc/3N5X-X68R] (detailing the experience of a farmer encountering this exact phenomenon).

204. *In re* StarLink Corn Prods. Liab. Litig., 212 F.Supp.2d 828, 847 (N.D. Ill. 2022).

intent, with no intentional, affirmative act on the part of the defendant traceable from the alleged injury.[205] Similarly, the causation element of a nuisance claim should also fail, as there is no unreasonable behavior on the defendant's part to link to the alleged injury.[206]

For a successful trespass claim, the defendant's intentional act must directly cause the alleged injury[207] while a private nuisance claim requires the defendant's unreasonable interference with the neighbor's use and enjoyment of their land be the cause of the disruption.[208] Under South Carolina law, "[t]respass is any intentional invasion of the plaintiff's interest in the exclusive possession of his property."[209] In other words, under South Carolina's trespass framework, the defendant need not intend that the pollen drift onto their neighbor's property, rather they only need to intend to perform the act at the top of the causal chain such that those acts directly cause the appearance of the GM sequence in the neighboring non-GM crop's genome.[210] However, even if the farmer does not plant a crop on his land, like the natural growth of infected volunteer wheat on the defendant's land in *Krug v. Koriel*,[211] the presence of any GM crop on the farmer's land, intentional or unintentional, can still lead to the same alleged injury due to the inevitability of cross-pollination. Thus, the defendant GMO farmer should fail the causation element of both nuisance and trespass claims because the fact cross-pollination will always occur when a GM crop is present, regardless of farmer intervention or lack thereof, prevents the GMO farmer's actions from being the direct cause of the drifting GM pollen.

Further, even assuming the defendant GMO farmers perform an affirmative act that sets off the causal chain of invasion, the alleged injury is not the direct result of such act because of the attenuated nature of plant reproduction. When approaching the causation issue, Professors Endres and Schlessinger look at the "'directness' and 'immediacy'" of the harm, pointing to the inevitability and reproductive necessity of pollination as enough to connect the intent to grow to the alleged harm.[212] However, the time delay inherent in plant reproduction—the result of which is the alleged injury—makes the farmer's act of planting the GM seed, although at the top of the causal chain, too attenuated from the growth of the new, cross-pollinated

205. *See supra* Section III.b.i.

206. *See supra* Section III.b.ii.

207. Snow v. City of Columbia, 305 S.C. 544, 553, 409 S.E.2d 797, 801 (S.C. Ct. App. 1991).

208. *See* Babb v. Lee Cnty. Landfill, 405 S.C. 129, 145, 747 S.E.2d 468, 476 (2013).

209. West v. Newberry Elec. Corp., 357 S.C. 537, 544, 593 S.E.2d 500, 503 (S.C. Ct. App. 2004).

210. *See id.*

211. 935 P.2d 1063, 1064 (Kan. Ct. App. 1997).

212. Endres & Schlessinger, *supra* note 21, at 832.

crop.[213] In other words, while the transfer of BE material is the direct result of a successful reproductive process, such cross-pollination is not the "direct result" of the pollen's invasion of the neighbor's land.[214] The lack of this "immediacy" as the pollen goes through the fertilization process makes the alleged injury an indirect result of the pollen drifting onto the land rather than the requisite direct consequence of the invasion itself.[215]

Looking at herbicide drift offers a helpful distinction to bolster this point. When a farmer applies herbicide atop his fields, his affirmative act of spraying directly causes the injury—plant death.[216] Considering that South Carolina courts explicitly look for the "immediate cause of the entry" when analyzing a trespass claim,[217] the injury under those analogous facts occurs somewhat immediately after the invasion, much more immediately than the fertilization of plants.[218] In other words, the farmer spraying the drifting herbicide onto his GM crops is the "immediate cause" of the herbicide's entry because the herbicide immediately drifts atop the neighboring crops upon release and damages them directly by causing death as early as within a few hours.[219] Thus, while there is no affirmative act or unreasonable behavior by the defendant causally connected to an injury, even if one is found, the attenuated nature of plant reproduction in the directness and immediacy between the act and the alleged injury prevents the satisfaction of causation for a trespass or nuisance claim.

D. Duty: How Negligence Fits

In addition to trespass and nuisance claims, the final claim that a plaintiff is likely to bring is a negligence claim, arguing that the neighboring GMO farmers owed them a duty to mitigate the risk of cross-pollination posed by their GMOs that they breached when they failed to employ precautionary pollen drift measures like pollen fencing or tassel covers.[220] However, South Carolina courts should not find the GMO farmers to have such a duty under

213. *See How Plants Reproduce*, ROYAL HORTICULTURE SOC'Y, https://www.rhs.org.uk/advice/understanding-plants/how-plants-reproduce [https://perma.cc/VG3Y-VBE2].

214. *See id.*

215. *See id.*

216. *See How Long Does It Take Weed Killer to Work?*, AM. LANDSCAPES, https://americanlandscapesllc.com/how-long-for-weed-killer-to-work/ [https://perma.cc/M9ZC-KNYD].

217. *See, e.g.*, Snow v. City of Columbia, 305 S.C. 544, 554, 409 S.E.2d 797, 802 (S.C. Ct. App. 1991).

218. *See* AM. LANDSCAPES, *supra* note 216 ("Contact herbicides typically show results within hours to a few days.").

219. *See In re* Dicamba Herbicides Litig., 359 F.Supp.3d 711, 718–19 (E.D. Mo. 2019) (involving allegations of crop damage and death caused by drifting herbicide during application that was meant for nearby GM crops).

220. *See* Endres & Schlessinger, *supra* note 21, at 845–46.

this factual scenario as a matter of public policy because of the necessity for GMOs to remain accessible to the public. To succeed on a negligence claim in South Carolina, the plaintiff must establish that the defendant owed them a legal duty that they then breached, and such breach actually and proximately caused their injury.[221]

In the case of drifting GM pollen, assuming the defendant acted negligently, the appearance of the GM sequence in the neighboring non-GM crop's genome would have to not have occurred absent the defendant's negligent acts to be the actual cause.[222] To satisfy proximate cause, the causal chain from the defendant's negligence to the alleged injury must not have been acted upon by intervening causes such that the chain remains intact.[223] To establish damages, the plaintiff must show that either "physical injury or property damage" occurred as a result of the defendant's breached duty.[224] Thus, organic or non-GMO farmers bringing a negligence claim are likely to argue that the neighboring GMO farmer owed them a legal duty to mitigate or prevent the risk posed by drifting GM pollen, pointing to the occurrence of cross-pollination as breach of duty, with successful cross-pollination as proof of causation and the presence of BE sequencing in their non-GM crop causing the loss of organic or non-GMO status as the injury. However, the negative public policy implications, as recognized by the federal legislative backing of GMO production, support South Carolina refusing to acknowledge such a duty.

1. Public Policy Push for GMOs: Federal Regulatory and Statutory Support of GMO Production

Despite not having much federal legislation speaking to their production,[225] the United States regulatory scheme generally supports the use

221. Vinson v. Hartley, 324 S.C. 389, 399, 477 S.E.2d 715, 720 (S.C. Ct. App. 1996).

222. RESTATEMENT (SECOND) OF TORTS § 432 (AM. L. INST. 1965) ("[T]he actor's negligent conduct is not a substantial factor in bringing about harm to another if the harm would have been sustained even if the actor had not been negligent.").

223. *See id.* § 440 ("A superseding cause is an act of a third person or other force which by its intervention prevents the actor from being liable for harm to another which his antecedent negligence is a substantial factor in bringing about.").

224. *See* Babb v. Lee Cnty. Landfill, 405 S.C. 129, 153, 747 S.E.2d 468, 481 (2013).

225. Luis Acosta, *Restrictions on Genetically Modified Organisms: United States*, Law LIBR. OF CONG., https://maint.loc.gov/law/help/restrictions-on-gmos/usa.php [https://perma.cc/UUU3-CZXV] (Dec. 30, 2020) ("The United States does not have any federal legislation that is specific to genetically modified organisms (GMOs). Rather, GMOs are regulated pursuant to health, safety, and environmental legislation governing conventional products."); *see also* EPA, GENETICALLY MODIFIED ORGANISMS, https://www.epa.gov/regulation-biotechnology-under-tsca-and-fifra/genetically-modified-organisms [https://perma.cc/M65M-PSNG] (June 20, 2024).

and availability of GMOs.[226] Specifically, the extensive federal and attempted state labeling regulations[227] show the legislative intent to allow GMO production while balancing the wants of the public in requiring transparent labeling to offer consumers the choice as to which products to consume.[228] While the production of organic crops is also heavily regulated, these regulations tend to put a duty on the organic farmers—not on the neighboring conventional or GMO farmers—to protect their crop's organic status,[229] thus further displaying an intentional absence of regulatory burdens on GMO production. For example, organic, non-GMO farmers have buffer zone requirements requiring "distinct, defined boundaries and buffer zones . . . to prevent the unintended application of a prohibited substance to the crop or contact with a prohibited substance applied to adjoining land that is not under organic management."[230] Further, many mitigation techniques are available to either farmer to reduce the risk of cross-pollination, including altering planting times to avoid synchronized flowering seasons with neighboring farms, increasing sanitation and seed isolation measures,[231] or implementing buffer zones on the outskirts of the fields containing crops intending to be sold under an organic label.[232]

Evidencing additional federal support, multiple federal statutes protect the production of BE foods and GMOs in the United States such that state ordinances sufficiently interfering with their production are preempted by

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226. Acosta, *supra* note 225 ("Compared to other countries, regulation of GMOs in the US is relatively favorable to their development.").

227. The USDA's "National Bioengineered Food Disclosure Standard now requires labeling of all foods that are genetically modified or contain GMO ingredients." Katie Amos, *Transparency on GMO*, A GREENER WORLD (Apr. 17, 2023), https://agreenerworld.org/a-greener-world/transparency-on-gmo/ [https://perma.cc/MSJ3-GN43]. Despite the fact that federal legislation in 2016 was meant to preempt state labeling requirements, some states are still attempting "to go beyond the federal legislation." *See* Clary Estes, *What's Been Happening in the State Legislatures on Agriculture Policy*, BIO.NEWS (Aug. 21, 2023), https://bio.news/state-policy/state-legislature-update-agriculture-policy-2023-legislative-session/ [https://perma.cc/GT8M-8ZNZ].

228. *See* Amos, *supra* note 227 ("[T]oday's consumers are looking for clear, meaningful product labels that indicate whether food products contain.").

229. *See, e.g.*, 7 C.F.R § 205.270 (2024) (outlining requirements for "handler[s] of . . . organic handling operation[s]" who sell, label, or represent their products as "100 percent organic," "organic," or "made with organic (specific ingredients or food group(s))").

230. USDA, AGRIC. MARKETING SERV., "HOW TO…" MODULES: BUFFER ZONES (2015), https://www.ams.usda.gov/sites/default/files/media/6%20Buffer%20Zones%20FINAL%20RGK%20V2.pdf [https://perma.cc/SNK9-G6WE]; 7 C.F.R. § 205.202(c) (2024).

231. *See Isolation Methods*, SEED SAVERS EXCH., https://seedsavers.org/learn/isolation-methods/ [https://perma.cc/QD93-TZ3T]. Pollination occurs in flowering season; thus, plants that do not flower in the same season are unable to fertilize one another. *See id.*

232. Miles McEvoy, *Organic 101: Can GMOs Be Used in Organic Products?*, USDA: BLOG (May 17, 2013, 1:20 PM), https://www.usda.gov/about-usda/news/blog/organic-101-can-gmos-be-used-organic-products [https://perma.cc/7AT8-UT7P].

federal law.[233] States have passed multiple local ordinances regulating or banning GMOs that were subsequently found to be federally preempted by the PPA.[234] Due to such preemption, state legislation is generally not available for states to regulate the production of GMOs.[235] Thus, federal preemption of state ordinances attempting to prohibit or limit the production of GMOs along with federal legislation imposing a duty on organic farmers to impose buffer zones to minimize herbicide drift show a legislative intent of continued GMO production.

2. Such Public Policy Push Outweighs the Implication of Duty on GMO Farmers

Multiple public policy arguments display the necessity of continued production of GMOs in the United States, and South Carolina should defer—in opposition of other jurisdictional views—to the history of GMO creation and the overall benefits they were created to offer by refusing to place a duty on GMO farmers to mitigate cross-pollination. Historically, scientists modeled the concept of GMOs on traditional crossbreeding techniques practiced for centuries, discovering genome editing as a way to make more precise changes in a more efficient amount of time than otherwise available through traditional methods.[236] In general, GMOs were created as a response to consumer needs, with insulin used to treat Type 1 diabetes being the first GMO approved for consumer use.[237] Genome editing tools continue to develop over time, creating a plethora of GMO options to meet the

233. *See generally* Plant Protection Act, 7 U.S.C. § 7701 *et seq.* Indeed, 7 U.S.C. § 7756(b) expressly prohibits "State[s] or political subdivisions of a State [from] regulat[ing]" interstate commerce in this field. The United States Constitution's Supremacy Clause dictates state laws that conflict with federal laws are "without effect." Priester v. Cromer, 401 S.C. 38, 43, 736 S.E.2d 249, 252 (2012) (quoting Cipollone v. Liggestt Group, Inc., 505 U.S. 504, 516 (1992)). This doctrine is triggered when a state passes a law that is contradictory to or otherwise interferes with a federal law. *Id.* Thus, in the context of GMO production, state ordinances aimed to regulate the movement or growing of such foods must not conflict with any other federal regulation to be upheld as valid law. *See id.*

234. *See, e.g.*, Haw. Papaya Indus. Ass'n v. County of Hawaii, 666 Fed. Appx. 631, 633 (9th Cir. 2016) (holding that a county ban on certain open air testing and cultivation of GE crops or plants was preempted by the PPA); Robert Ito Farm, Inc. v. County of Maui, 111 F.Supp.3d 1088, 1105 (D. Haw. 2015) (similar).

235. Acosta, *supra* note 225.

236. FDA, SCIENCE AND HISTORY OF GMOS AND OTHER FOOD MODIFICATION PROCESSES [hereinafter SCIENCE AND HISTORY OF GMOS AND OTHER FOOD MODIFICATION PROCESSES], https://www.fda.gov/food/agricultural-biotechnology/science-and-history-gmos-and-other-food-modification-processes [https://perma.cc/Z8KL-CB6S] (Mar. 5, 2024).

237. *Id.*

everchanging needs of the public and to overcome global challenges as they arise.[238]

However, courts in other jurisdictions have ignored this history of GMO creation when reviewing BE pollen drift suits between manufacturers and non-GMO farmers.[239] Specifically, courts have gone so far as to extend negligence liability to the GM seed manufacturers in regard to their regulatory approval of the GM seed. For example, in *In re Syngenta*,[240] the District of Kansas, after analyzing a list of factors,[241] determined the defendant manufacturers owed a legal duty to the plaintiffs who suffered injuries due to their non-GM crops cross-pollinating with the GM corn seed manufactured by the defendant.[242] Plaintiffs brought suit against Syngenta, alleging that their non-Syngenta products were cross-pollinated by Syngenta's Viptera MIR 162 seed, a GM corn crop coding for specific insect-resistant genes.[243] The court ultimately held it to be reasonable to impose "a duty on a manufacturer to exercise reasonable care not to commercialize and sell its product in a way that creates a risk of widespread harm resulting from the intended use of the product by all of its customers."[244]

The imposition of a duty on the defendant manufacturer, a party even more attenuated from the alleged injury than the farmers actually growing the GMOs, on its time, manner, and scope of commercialization of their GM seeds offers a strong indication that the court would likely find the neighboring farmers sufficiently close to the alleged harm such that the GMO

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238. *See* FDA, HOW GM CROPS IMPACT OUR WORLD [hereinafter HOW GM CROPS IMPACT OUR WORLD], https://www.fda.gov/food/agricultural-biotechnology/how-gmo-crops-impact-our-world [https://perma.cc/PGY9-DA6U] (Mar. 5, 2024); SCIENCE AND HISTORY OF GMOS AND OTHER FOOD MODIFICATION PROCESSES, *supra* note 236.

239. *See, e.g.*, *In re* StarLink Corn Prods. Liab. Litig., 212 F.Supp.2d 828 (N.D. Ill. 2002); *see also In re* Dicamba Herbicides Litig., 359 F.Supp.3d 711 (E.D. Mo. 2019); *In re* Syngenta AG MIR 162 Corn Litig., 131 F.Supp.3d 1177 (D. Kan. 2015).

240. In this MDL, brought in the District of Kansas, the specific harm plaintiffs alleged involved China's rejection of U.S. corn containing the GM MIR 162 sequence for around a year before the subsequent regulatory approval of the GMO. 131 F.Supp.3d at 1186. Plaintiffs pointed to the decrease in corn prices stemming from the inability to sell their contaminated corn crops to China as the harm suffered from Syngenta's negligence. *Id*. For the negligence claims, the parties stipulated "the existence of a legal duty [was] a required element for [such] claims," but their agreement ended regarding whether the defendant owed the plaintiffs a duty, with Syngenta stating no such duty existed. *Id.* at 1188.

241. Such factors were proposed by a treatise, including, among others, "the foreseeability of harm to the plaintiff;" "the closeness of the connection between the defendant's conduct and the injury suffered;" "the magnitude of the burden guarding against the injury;" and "whether the injury is too wholly out of proposition to the tortfeasor's culpability." *Id.* at 1189.

242. Specifically, the court stated it to be incorrect to say that Syngenta did not owe plaintiffs a legal duty "to exercise reasonable care in the manner, timing, and scope of its commercialization of its Viptera and Duracade products." *Id.* at 1193.

243. *Id.* at 1186–87.

244. *Id.* at 1191.

farmers would owe their non-GMO neighbors a legal duty as well.[245] In other words, if there is enough closeness such that a duty is owed in the commercialization of the GM seed due to the risk of genetic drift, it follows that the farmer's use of the GM seed itself is close enough that they too would owe a legal duty to their non-GMO neighbors in mitigating pollen drift.

However, this extension of liability goes too far. The court's liability exposure to manufacturers for an alleged injury caused after the growth and production of their seeds again ignores the scientific inevitability of cross-contamination—even with mitigation measures in place—due to so many uncontrollable factors acting upon the pollen after planting.[246] In addition to the unavoidability of pollen drift, courts should not require GMO farmers to take mitigation measures like tassel covers or pollen fence barriers as part of a duty of reasonable care because such measures place a significant burden on GMO production that is contrary to public policy. As the court in *Syngenta* notes, even under the presumptive rule requiring everyone owing "a duty of care not to create unreasonable risks to others," public policy concerns are enough to foreclose the imposition of a duty even when the behavior is found to be unreasonable.[247] Here, GMOs' vital role in combatting food insecurity, providing economic efficiency in crop production, and offering more nutritious or safer counterparts are enough of public policy concerns that warrant an exemption of duty on GMO farmers to mitigate the risk of cross-pollination posed by their GMOs.[248]

Holding GMO farmers liable deters GMO production, which can implicate a multitude of negative impacts. Some of the main benefits and justifications for GMOs include increased crop yield, decreased production costs, increase drought resistance, combatting nutrient deficiencies through biofortification, and increased overall food supply to help fight food insecurity.[249] Specifically, because GMOs are commonly used for increased resistance to insect damage and plant viruses and for herbicide tolerance, removing such advantages leads to increased crop loss and higher growing costs.[250] Higher production costs lead to higher consumer purchase prices,[251] reopening the very gap GMOs were created to bridge between affordable

245. *See id.*

246. *See id.*; *Cross-Pollination*, *supra* note 70 (explaining that wind, bees, bird, bats, among other things, all move pollen); Endres & Schlessinger, *supra* note 21, at 832, 845–46.

247. *See* 131 F.Supp.3d at 1189–90.

248. *See supra* Section II.b.

249. *See Five Surprising Benefits of GMOs*, NEB. CORN BD., https://nebraskacorn.gov/cornstalk/food/five-surprising-benefits-of-gmos/ [https://perma.cc/KL5B-5VAQ].

250. *See* HOW GM CROPS IMPACT OUR WORLD, *supra* note 238.

251. Alexander Stevens et al., USDA: AMBER WAVES, ERS DATA PRODUCTS SHOW FOOD-AT-HOME PRICE INFLATION FROM PRODUCERS TO CONSUMERS (July 10, 2023), https://www.ers.usda.gov/amber-waves/2023/july/ers-data-products-show-food-at-home-price-inflation-from-producers-to-consumers/ [https://perma.cc/FRQ3-SNK5].

growing costs and sustainable profits for farmers and economically feasible food options for consumers in a world already faced with food insecurity. One study even cited the development of *Bt* cotton as having a direct correlation with decreased farmer suicide rates, citing at least 75,000 suicides prevented.[252] Thus, exposing GMO farmers to negligence liability negatively impacts their livelihood and ability to support themselves financially when they are forced to grow a crop with less durability and higher production costs.[253]

On the consumer side, burdening GMO production further strains the food insecurity issue, with the market now offering fewer options for consumers to purchase.[254] With more consumers facing food insecurity, a slew of other policies like the Supplemental Nutrition Assistance Program ("SNAP")[255] or the Women, Infants and Children ("WIC") program[256] are implicated in a domino-like cascade effect, as more individuals now qualify for these programs and the like.[257] In sum, South Carolina should prioritize its farmers needing a more financially reliable option to make a living and its consumers needing to purchase foods at an affordable rate to provide for themselves and their families when considering its approach to tort policy.

Further, the existence of the substantial equivalence standard supports the stance that the appearance of the GM sequence in the neighboring non-GM crop's genome amounts to a harm rather than a physical injury such that public policy still tips in favor of their production. "Substantial equivalence" is a qualification standard that requires GM crops to be "the same as the non-GM crop except for the traits that were enhanced, added, or removed through genetic engineering."[258] The analyses completed through substantial equivalence testing, along with other data from thousands of studies collected over the years, has led to "a solid and clear consensus that GM crops do not

252. Stuart J. Smyth, *The Human Health Benefits from GM Crops*, 18 PLANT BIOTECH. J. 887, 887 (2019).

253. *See* Graham Brookes & Peter Barfoot, *Economic Impact of GM Crops*, 5 GM CROPS & FOOD: BIOTECH. AGRIC. & FOOD CHAIN, Feb. 5, 2014, at 65, 68–70.

254. *See* Matin Qaim & Shahzad Kouser, *Genetically Modified Crops and Food Security*, PUB. LIBR. SCI., Jun. 2013, at 1 (detailing ways that GM crops impact food security).

255. *Policy Basis: The Supplemental Nutrition Assistance Program (SNAP)*, CTR. ON BUDGET & POL'Y PRIORITIES, https://www.cbpp.org/research/food-assistance/the-supplemental-nutrition-assistance-program-snap (Nov. 25, 2024).

256. USDA: FOOD & NUTRITION SERV., WIC FACTSHEET, https://www.fns.usda.gov/wic/factsheet [https://perma.cc/3DNQ-D62F] (Oct. 7, 2024).

257. *See* Noura Insolera et al., *SNAP and WIC Participation During Childhood and Food Security in Adulthood, 1984–2019*, 112 AM. J. PUB. HEALTH 1498, 1498 (2022).

258. *Substantial Equivalence of GM and Non-GM Crops*, GLOBAL KNOWLEDGE CTR. ON CROP BIOTECH. 2 (Mar. 2018), https://www.isaaa.org/resources/publications/pocketk/foldable/Pocket%20K56%20(English) [https://perma.cc/LF3N-M3SR]; *see also* Portfield & Entine, *supra* note 99.

provide more risk than those that have been developed by conventional breeding techniques."[259]

While some argue that GM crops are inherently less safe than their non-GMO counterparts due to their inability to exist in nature absent human intervention,[260] genetic engineering allows for a level of precision and specificity not possible in conventional breeding techniques, which can make GMOs safer than other conventional breeding methods.[261] At large, the scientific community generally contends that "there is no substantial evidence showing that genetically modified foods are unsafe."[262] On the contrary, some GMOs produced are identical to their non-GMO counterparts in terms of nutritional makeup, while others are engineered to be even healthier than their non-GMO option.[263] With GM crops considered "substantially equivalent" from a scientific perspective, the non-GM crops are not necessarily injured under any of the tort theories, but rather are simply different than originally desired, supporting the GMO farmer's argument that the injury claimed by organic farmers is more of an unfavorable alteration. Thus, such unfavorable alteration is better defined as a harm that should not amount to a legally recognizable injury, and the scientific backing of GMO safety along with the multitude of benefits they offer justifies applying the public policy exemption to duty as set forth in *Syngenta* to avoid burdening their production.[264]

3. Non-GMO and Organic Farmers Should Bear Any Duty to Mitigate

The reproductive necessity, inevitability, and lack of legal injury supports the placement of the onus on non-GMO or organic farmers to take mitigation measures to avoid genetic drift. Either party can take mitigation measures to help avoid cross-pollination, but there is no current legal framework outlining

259. GLOBAL KNOWLEDGE CTR. ON CROP BIOTECH., *supra* note 258, at 10.

260. *See, e.g.*, Bala, *supra* note 37.

261. FDA, GENOME EDITING IN AGRICULTURAL BIOTECHNOLOGY, https://www.fda.gov/food/agricultural-biotechnology/genome-editing-agricultural-biotechnology [https://perma.cc/PMA3-XQEZ] (Mar. 5, 2024).

262. *Americans Support GMO Food Labels but Don't Know Much About Safety of GM Foods*, UNIV. OF PA.: ANNENBERG PUB. POL'Y CTR. (July 18, 2016), https://www.annenbergpublicpolicycenter.org/americans-support-gmo-food-labels-but-dont-know-much-about-safety-of-genetically-modified-foods/ [https://perma.cc/E2WF-4Q2V]; *see also* Stuart J. Smyth et al., *Removing Politics from Innovations that Improve Food Security*, 30 TRANSGENIC RSCH. 601, 602 (2021) ("Science-based risk assessments have quantified the safety of GM crops for human consumption and economic impact assessments have quantified the yield increases.").

263. *Foods Made with GMOs Do Not Pose Special Health Risks*, NAT'L ACADS. (May 2, 2022), https://www.nationalacademies.org/based-on-science/foods-made-with-gmos-do-not-pose-special-health-risks [https://perma.cc/YM2P-QT2L].

264. 131 F.Supp.3d 1177, 1189–90 (D. Kan. 2015).

which farmer bears the burden. However, the sound public policy supporting GMO production tips the scales in in favor of requiring the organic or non-GMO farmer to protect themselves from pollen drift.[265]

Either party can implement the multiple techniques available to mitigate the risks of cross-pollination in flowering crops that look to the biological reproduction of the crop itself to minimize fertilization opportunity.[266] Flowering crops reproduce sexually through pollination when pollen grains from one plant travel through abiotic factors or vectors to the flower of another plant.[267] The pollen and the ovary of the flower must be sexually mature to allow for successful reproduction.[268] Thus, the farmer needs to prevent the pollen spores from arriving to the ovary of the other plant before it reaches reproductive maturity.[269] One highly effective technique to help avoid spore delivery, known as "isolation," involves planting the non-GM crop sufficiently far enough from the GM crop field such that the risk of pollen reaching the crops is minimal.[270] Increasing the distance between the fields farther than the average travel distance of a pollen spore significantly decreases the chance the spore has to arrive in the other plant.[271]

Further, looking at the reproductive cycle of crops, staggering planting times helps avoid crossover in flowering seasons when the plants are sexually mature and able to reproduce.[272] Since crops can only reproduce with compatible species, non-GMO farmers can also plan to grow crops that are sexually incompatible with the neighboring GM crops to decrease the risk of cross-pollination.[273] Other less effective techniques include creating buffer zones or physical barriers to help avoid the abiotic transfer of pollen.[274] Utilizing these mitigation techniques allows both the GMO and non-GMO

265. Further, regardless of whether the organic, non-GMO neighboring farmer is growing GMO or inorganic non-GM crops, the risks are not limited to cross-pollination with GM crops. Non-GMO farmers using conventional farming practices such as herbicide or insecticide application would still lead to the organic farmer losing its organic certification status if their crops are contaminated through drift.

266. *See* Thomison & Geyer, *supra* note 26.

267. DANIELA DUTRA ELLIOT & PAULA MEJIA VELASQUEZ, BOTANY IN HAWAI'I 5.2 (2024), https://bio.libretexts.org/Bookshelves/Botany/Botany_in_Hawaii_(Daniela_Dutra_Elliott_and_Paula_Mejia_Velasquez)/05%3A_Flowers_fruits_and_seeds/5.02%3A_Plant_reproduction-_pollination_and_fertilization [https://perma.cc/56Z4-N84R].

268. *See Cross-Pollination*, *supra* note 70.

269. *See* Thomison & Geyer, *supra* note 26; *see also Isolation Methods*, *supra* note 231.

270. *See* Thomison & Geyer, *supra* note 26; *Isolation Methods*, *supra* note 231.

271. *See* Thomison & Geyer, *supra* note 26; *Isolation Methods*, *supra* note 231.

272. *See* Thomison & Geyer, *supra* note 26; *see also Isolation Methods*, *supra* note 231.

273. *See* Jennie Fallis, *Planning for Seed Saving*, MACDONALD CAMPUS SEED LIBR., https://libraryguides.mcgill.ca/c.php?g=632620&p=5002672 [https://perma.cc/AD3J-GWZU] (Jan. 28, 2025).

274. *Isolation Methods*, *supra* note 231.

farmer to grow the types of crops they wish while following the scientific and policy guides supporting GM crop production.

IV. CONCLUSION: THE MAIN TAKEAWAYS

South Carolina is in the position to build its own precedent for this novel issue. When the time comes, the state should look at the intersection of science and the law to avoid placing a mitigation burden on its landowners that opens them up to liability in a tort regime unable to handle the nuances of this difficult issue. Federal regulations are in place to guide GMO production and to give the courts insight on how the legislative branch intends for them to treat disputes arising out of GM crop production. Organic or non-GMO farmers have a variety of mitigation measures they can employ to help protect their crops from genetic drift. Each farmer has the right to the free use and enjoyment of their property, and the tension in this instance is not so extreme on either side that one outweighs the other. Perhaps the courts should put the issue back in the hands of landowners by emphasizing their ability to enter into contractual agreements with neighboring farms to work out amongst themselves any remedies in the event of genetic drift. By doing so, each is able to use their property as they wish, the necessity and inevitability of genetic drift is acknowledged by both parties, and an agreed upon damages amount is in writing to rectify any potential losses by the non-GMO farmer. Just one court holding a GMO farmer liable under a tort claim for drifting GM pollen will act as a linchpin, letting loose a multitude of suits being brought to court with precedent allowing non-GMO or organic farmers to successfully recover for acts of nature, and the effects of such precedent will be much harder to control than drifting pollen.