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Legal Liability in the Wake of *Starlink*™: Who Pays in the End?

by

Amelia P. Nelson

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LEGAL LIABILITY IN THE WAKE OF *STARLINK*™: WHO PAYS IN THE END?

Amelia P. Nelson

I. INTRODUCTION

Legal liability repercussions have recently surfaced in the aftermath of the mix-up between consumption approved grains and *StarLink*, an unapproved biotech

variety of genetically engineered ("GE") corn.[1] It all began when growers and shippers, who were not aware that *StarLink* was unapproved for human consumption, did not quarantine the GE grain from other grains.[2] *StarLink* was consequently commingled with other approved corn varieties and found its way into the food system.[3] It was later detected in hundreds of different food products throughout the United States, in addition to having been located in grain loads, elevators, trains, barges, and other warehouse and transportation equipment.[4] While the genetically engineered corn has only a tiny amount of hard to digest protein, the concern that *StarLink* could cause allergic reactions in consumers was enough for the Federal Drug Administration ("FDA") to hold back approval.[5] Frustration, turmoil, increased cost, and damages arose from the invasion.[6] Moreover, the fiasco escalated to an international market scare that threatened to damage the entire agricultural corn market.[7]

This note, using the *StarLink* disaster as an example, explores the legal obligations associated with commingling, mishandling, and contamination of GE and non-GE crops. The circumstances surrounding the *StarLink* scare reveal the likelihood of future similar occurrences, thus requiring appropriate legal remedies. With the expanding use of genetically engineered organisms ("GEOs") in the agricultural arena there is an increased certainty that the associated risks and subsequent damages will find their way into the legal forum.[8] This is due in large part to the risk of commingling unapproved GE grains with approved or non-GE grains.[9] As GE crops become progressively more common throughout the United States, there will be increased opportunity for GE crops to neighbor organic, non-GE, or restricted GE crops. With the escalation of neighboring crops, there will likely be increased contamination unless reliable, precautionary steps are implemented.[10] However, if these steps are overlooked or disregarded, farmers will likely squander crop

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1. *See* George Anthan, *OK Sought for Corn in Food,* DES MOINES REG., Oct. 26, 2000, at 1D.

2. *See* Patrick J. MacNamara, *EPA Becomes Involved in the Genetically Engineered Foods Industry*, 6 ENVT'L COMPLIANCE & LITIG. STRATEGY 4, 4 (Nov. 2000).

3. *See* Des Keller & Dan Miller, *Biotech's Black Eye*, PROGRESSIVE FARMER, Dec. 2000, at 24.

4. *See id.*

5. *See* Tony Leys, *StarLink Dangers Disputed*, DES MOINES REG., Oct. 27, 2000, at 1D (stating that it is the Cry9C inserted in the crop that creates the potential for allergic reaction); *see also* Marc Kaufman, *Group: Biotech Corn Found in Taco Shells/Modified Grain Not Approved For Humans,* HOUS. CHRON., Sept. 18, 2000, at 2.

6. *See* Keller & Miller, *supra* note 3, at 24.

7. *See id.* at 25.

8. *See* Richard A. Repp, *Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift*, 36 IDAHO L. REV. 585, 598 (2000).

9. *See generally id.* at 590-91 (addressing the liability scenarios and potential damages resulting from the production of GE crops when there is GE crop contamination).

10. *See* Keller & Miller, *supra* note 3, at 24 (stating the StarLink requirement that it was to be enclosed by a 660-foot buffer zone).

marketability, importers will lose the introduction of the crop into their food source, and consumers will suffer the loss of better products.

This note begins with an explanation of GEO history and background, and considers the benefits and drawbacks of GE products. Next, the note addresses the damages sustained by farmers, importers, and consumers as a result of crop contamination. After considering liability and potential damage scenarios, the note will tackle available American legal remedies including: strict liability, nuisance, negligence, products liability, breach of contract, and trespass. In conclusion, this note will consider the results of the *StarLink* disaster and explore the legal ramifications faced by all players. [11]

II. WHERE IT ALL BEGAN: GEO HISTORY AND BACKGROUND

Genetically engineered organisms represent an ever-increasing share of the grain produced in the United States despite the increased legal exposure and chronic consumer concerns.[12] Approximately twenty years ago the agricultural community responded, through the use of biotechnology, to the world crises of depleted global natural resources, world hunger, a grossly expanding world population, and ecosystem contamination.[13] Biotechnological advances have sought to increase the productivity and genetic diversity of existing grains and crops.[14] For this reason, GEOs have been heralded as the likely solution to some of the major predicaments the world faces today.[15] Genetic engineering allows the individual genes from one species to be transferred to another species in order to "improve the nutritional value of plants and increase their yield and performance."[16] Subsequent, however, to the development of such biotechnology, there has been an ongoing debate regarding the risks associated with biotechnology and GEOs.[17] Despite the benefits attributed to GEOs, such as

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11. *See id.*

12. *See* Thomas P. Redick & Christina G. Bernstein, *Nuisance Law and the Prevention of "Genetic Pollution": Declining a Dinner Date with Damocles*, 30 ENVTL. L. REP. 10,328, 10,328 (2000) (stating that more than one-half of the soybeans and nearly one-third of the corn in the United States came from genetically engineered seed in 1999).

13. *See generally* Sara M. Dunn, *From Flav'r Sav'r to Environmental Saver? Biotechnology and the Future of Agriculture, International Trade, and the Environment*, 9 COLO. J. INT'L ENVTL. L. & POL'Y 145, 145-46 (1998) (stating that providing sufficient food and fiber for the ever increasing population has been potentially solved by biotechnology); *see also* Steven H. Yoshida, *The Safety of Genetically Modified Soybeans: Evidence and Regulation*, 55 FOOD & DRUG L.J. 193, 193 (2000) (stating that other reasons for genetically modified foods are to improve: resistance to pests and diseases, growth in various environmental conditions, flavor, texture, shelf-life, and protein content).

14. *See* Yoshida, *supra* note 13, at 193.

15. *See* Repp, *supra* note 8, at 586.

16. JEREMY RIFKIN, THE BIOTECH CENTURY 17 (1998); *see also* Yoshida, *supra* note 13, at 193.

17. *See* Julie Teel, *Regulating Genetically Modified Products and Processes: An Overview of Approaches*, 8 N.Y.U. ENVTL. L.J. 649, 650 (2000) (stating that while opponents of GEOs believe that a precautionary principal should serve as a guide when there is such a degree of scientific uncertainty,

increased yields and a reduced need for pesticides, the public, including scientists and international governments, remains divided as to the ecological harm and health risks associated with GEOs.[18] Although the extent of the considered risks is not proven, the recent *StarLink* events preserve the basis for general fears and concerns.[19]

There are many opinions both in opposition and in support of biotechnological advances in genetic engineering.[20] Those in opposition to biotechnology advances have determined that genetic pollution will surface and spread in the near and distant future, "destroying habitats, destabilizing ecosystems, and diminishing remaining reservoirs of biological diversity . . .."[21] While biotech advantages are uncovered and used, the anticipated detrimental effect on people and the earth's environment transforms such advantages into disadvantages.[22]

Consumer apprehension ranges from fears of unknown human health consequences resulting from consumption to amorphous pest evolution extending from environmental risks.[23] Notwithstanding these concerns, and while international and local markets remain wary of genetically engineered products,[24] GE and non-GE crops continue to mature in adjacent fields without barricades or buffers to shut out infiltrating seed pollen.[25] Moreover, machinery, grain elevators, and transportation containers continue to provide the perfect environment for commingling.[26] The close proximity of fields containing opposing seed is likely to result in cross-pollination,[27] and crops are certain to contain some genetically engineered material brought in by

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proponents feel that the tangible benefits of GEOs should outweigh the speculation of risks).

18. *See id.* at 649.

19. *See generally* Repp, *supra* note 8, at 586-87 (suggesting that while biotechnology is supported on the basis of "alleviating human suffering" many criticize the industry on the basis of potential risks).

20. *See* Philip L. Bereano, *Some Environmental and Ethical Considerations of Genetically Engineered Plants and Foods*, *in* CHANGING NATURE'S COURSE: THE ETHICAL CHALLENGE OF BIOTECHNOLOGY 27, 27 (Gerhold K. Becker et al. eds., 1996) (stating that corporate promoters and their "governmental handmaidens" have been hesitant and "irrational" in their systematic refusal to acknowledge the environmental and ethical considerations embodied within genetic manipulation).

21. RIFKIN, *supra* note 14, at 70.

22. *See id.* at 67.

23. *See* Neil D. Hamilton, *Legal Issues Shaping Society's Acceptance of Biotechnology and Genetically Modified Organisms*, 6 DRAKE J. AGRIC. L. 81, 83 (2001); *see also* Mike A. Singer, *Food for Thought-Issues in Agricultural Biotechnology*, CHICAGO FED LETTER (The Federal Reserve Bank of Chicago, Chicago, IL), Jan. 2000, at 2.

24. *See* Hamilton, *supra* note 23, at 84.

25. *See id.* at 103-04 (stating that some growers grow GEO crops, others grow non-GEO crops, and pollen mixes between the two).

26. *See* Neil E. Harl, *Genetically Modified Crops: Guidelines for Producers*, 10 AGRIC. L. DIG 19, 145-46 (Oct. 1, 1999), *available at* http://www.ngca.com/biotechnology/know_where/know_grow_guidelines.html.

27. *See* John P. Mandler & Kristin R. Eads, *Potential Liability Exposure to Seed Companies from GMO Pollen Drift*, AGRA/INDUSTRIAL BIOTECHNOLOGY, LEGAL LETTER, May 2000, at 1.

natural occurrences.[28] Accordingly, the required segregation of seed and crops has created a significant burden on farmers to ensure that the product they plant is the product they are left with in the end.[29] Because of this negative sentiment, growers and grain companies are now required to segregate genetically engineered crops from non-GE crops.[30] This places a heavy burden on the farmer.

A. *Farmer's Issues*

The specific and overwhelming legal issue taunting farmers and seed companies alike is the inadvertent contamination of non-GE crops by GE crops.[31] In fact, there are many ways that contamination and intermixing occur: genetic drift, animal transfer, commingling, mishandling, or from mislabeling, as was recently stumbled upon by farmers who received no special warning (or explanation of caution) when they purchased and consequently mixed the unapproved *StarLink* variety with approved corn varieties.[32] Consequently, as crops containing GE and non-GE products grow side-by-side tempting contamination, the agricultural economy faces global markets that shirk from GEOs.

Farmers are faced with the risk that their crops will not be marketable once harvested.[33] Most major supermarket chains, beer breweries and certain flour millers are rejecting genetically engineered products in the global arena.[34] Farmers are thus facing the important issues of seed certification, crop segregation, product labeling, and potential liability.[35] Higher food costs are predicted because of these issues.[36]

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28. *See infra* Part IV.

29. *See* Keller & Miller, *supra* note 3, at 24-6. In west-central Kentucky a farmer had 57,000 bushels of stored hybrid corn that he could not sell after the StarLink fiasco. *See id.* at 24.

30. *See* David Wheat, *Delivery of GMO-Free Soybeans to Consumers in Europe Not Possible Without Added Costs*, FEEDSTUFFS, June 15, 1998, at 14 (stating that consumers in Europe, specifically, are requiring segregation of GE crops from non-GE crops).

31. *See* Repp, *supra* note 8, at 590 (producers have suffered financial losses because of cross-contamination).

32. *See generally* William Ryberg, *Growers of Biotech Corn Say They Weren't Warned*, DES MOINES REG., Oct. 25, 2000, at 1A (stating that farmers received no special warning or explanation when they purchased StarLink seed); *see also* Keller & Miller, *supra* note 3, at 24.

33. *See* Harl, *supra* note 26, at 145 (producers are being required to promise that their crops are not genetically modified, and are subject to litigation for promising falsely, or potentially, for a violation of an implied warranty of merchantability), *available at* http://www.ncga.com/biotechnology/know_where/know_grow_guidelines.html.

34. *See Corn Growers State Uncertainty Continues to Plague Genetically Modified Crops No Good News in Store for Biotechnology Companies as U.S. Farmers Turn Their Backs on the Planting of GMOs*, GE-USA FARMING, PR NEWSWIRE, Jan. 3, 2000 (discussing Europe's major supermarket chain, Asia's major beer breweries, Japan's largest flour miller, and Mexico's largest tortilla maker having all rejected genetically engineered food products).

35. *See id.*

36. *See id.*

Moreover, uncertainties and fears stemming from the impending doom of liability and the cost of segregation are driving farmers away from GE seeds.[37]

B. *Corporate Issues*

Seed companies also have genuine concerns when it comes to their biotech seed. In fact, "Monsanto likes to bill itself as the answer to farmers' problems and the solution to the world's food crisis."[38] Yet, while such seed companies pride themselves on these biotechnology advances, their plans may easily turn into ecological and social nightmares.[39] Monsanto suggests that the fears are, in reality, just fantasies. However, some of Monsanto's seeds have already yielded problems.[40] While seed companies acknowledge that the non-GEOs do contain some low levels of GE germ plasm, the honesty only adds to the negative publicity that GE products face in light of inadvertent contamination scenarios.[41]

Initially, global corporate and consumer interests fueled the creation and introduction of transgenic crop species.[42] Today, however, consumers hold biotech corporations to blame for negative results due to biotechnological advances.[43] Consequently, the biotechnological advances and subsequent results have left farmers and consumers at a disadvantage. Consumers now fear the worst in health and environmental exposure, while the farmers fear the economic effects when their crops become unmarketable because of contamination.

C. *International Issues*

StarLink brought the economic and legal focus of GEOs to the international market, specifically to Europe and Asia.[44] As a result of heightened consumer

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37. *See id.*

38. Jennifer Kahn, *The Green Machine: Is Monsanto Sowing the Seeds of Change, or Destruction?*, HARPER'S MAGAZINE., Apr. 1999, at 71.

39. *See* Neil D. Hamilton, *StarLink Fiasco: Biotech Gives Itself a Black Eye*, DES MOINES REG., Oct. 31, 2000, at 9A (stating the *StarLink* disaster is an excellent example of the potential hazards stemming from unapproved GEOs being grown and sold in the same market as approved GE and non-GE crops).

40. *See* Kahn, *supra* note 38, at 71.

41. *See* Harl, *supra* note 26, at 145-46, *available at* http://www.ngca.com/biotechnology/know_where/know_grow_guidelines.html.

42. *See* Stephen K. Lewis, *"Attack of the Killer Tomatoes?" Corporate Liability for the International Propagation of Genetically Altered Agricultural Products*, 10 TRANSNAT'L LAW. 153, 172 (1997).

43. *See* Kahn, *supra* note 38, at 73 (stating that because of market growth it will become necessary for Monsanto to guard patents using terminator technology to destroy the seed after one season and therefore the "suicide seed" or "terminator seed" is an effort to prevent seed saving, an economic helping tool for farmers).

44. *See* Harl, *supra* note 26, *available at* http://www.ncga.com/biotechnology/know_where/know_grow_guidelines.html (last reviewed May 29,

concerns, many markets placed restrictions on the importation and use of products containing GE substances.[45] Europe, Japan, South Korea, Australia, and New Zealand have all imposed regulations and sanctions on American GE exports.[46]

Europe has pursued GEO restrictions for several years.[47] The European Union ("EU") market negatively impacted the American grain industry's export market when it imposed stringent restrictions on GE products.[48] The EU recently suspended the importation of previously approved GE corn citing scientific uncertainty as grounds for suspension.[49] The EU GEO suspension lead to negative publicity, and consequently farmers now fret over the threat of a two-tiered market where unapproved products, such as *StarLink*, sell domestically at a discount compared to other exportable crops.[50] The concern focuses expressly on economic uncertainty. When certain GE crops are accepted and used regularly in the United States, while importing countries may not accept the same grain, an unstable and uncertain consumer market is created.

III. GEO CONCERNS

Scientists, consumer activists, environmentalists, and farmers have criticized the biotech industry with regard to the potential risks associated with GEOs.[51] Although agricultural biotechnology is celebrated as the solution to many critical international problems pertaining to food quality and quantity, legal activity in the biotech arena has increased.[52] The legal reactions are a consequence of fears that are based upon crop-contamination by GEOs.[53] Consequently, seed companies and growers are facing the inescapable reality of legal exposure by consumers and

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45. *See* T.R. Reid, *Europe Again in Food Flap; Gene-Altered Seeds Sold by Mistake*, WASH. POST, May 19, 2000, at EO2 (explaining that the environmental and consumer groups of Europe have branded new plant technology as the "public enemy").

46. *See* Repp, *supra* note 8, at 593.

47. *See* Teel, *supra* note 17, at 667.

48. *See* Repp, *supra* note 8, at 593.

49. *See* Hamilton, *supra* note 23, at 101; *see also* Teel, *supra* note 17, at 667.

50. *See* Hamilton, *supra* note 23, at 101-02.

51. *See* Dunn, *supra* note 13, at 154-55.

52. *See generally* Steve L. Taylor, *Taco Troubles Could Have Been Avoided*, DES MOINES REG., Oct. 27, 2000, at 15A (stating that "current biotech products allow farmers to increase their yields and reduce the need for chemical pesticides"); *see, e.g.*, Singer, *supra* note 23, at 1 (discussing the potential of GEOs to provide tremendous benefits to production agriculture, processors, and consumers by increasing crop yields, enhancing plant ability to withstand climatic extremes, and further to reduce chemical use and related environmental impact).

53. *See* Repp, *supra* note 8, at 590 (stating that examples of actual damages resulting from production of genetically engineered crops reveal that there are legitimate concerns that producers may face liability).

international importers.[54] Consumers and producers fear that unknown aspects of biotechnology may surface in the form of health complications, pest evolution and ecological harm.[55] The key concern "is that the ecological and human health effects . . . are largely unknown . . .."[56]

A. *Health Concerns*

StarLink corn was not approved for human consumption because of allergen concerns.[57] The question of negative health effects, along with demonstrated health risks, such as allergic reactions, associated with genetically altered food products provides substance to consumer health concerns.[58] Allergic reactions to biotech products are difficult to foresee and even harder to test.[59] Consequently, health concerns have risen to the level of panic and have dealt a thorny blow to GE crop farmers.[60] In fact, the root of international import sanctions is in direct reaction to unknown health concerns.[61] As a result, the EU currently requires that all GEO products be labeled according to the amount of GEOs present.[62] Sadly, this requirement promotes greater fear of the product, thus harming GEO marketability. This negative publicity detracts from all the hard work and money the farmer put into a more productive crop. American sentiment is akin to the European concerns, as Americans also fear unknown allergic reaction. But for the most part, American consumers are less wary of genetic alteration and more inviting of better tasting, faster growing, and longer lasting products.[63]

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54. *See id.*

55. *See generally* RIFKIN, *supra* note 14, at 81 (discussing issues when playing "ecological roulette").

56. Teel, *supra* note 17, at 650.

57. *See* Leys, *supra* note 5, at 1D.

58. *See* Teel, *supra* note 17, at 650.

59. *See id.* at 658; *see also* George Anthan, *StarLink Controversy May Be Tip of Iceberg, Consumer Group Says*, DES MOINES REG., Jan. 12, 2001, at 4A (stating GE-foods might produce allergic reactions). *See e.g.*, Taylor, *supra* note 52, at 15A (stating that *StarLink* could not be approved for human consumption because there was no assurance that people would not have allergic reactions).

60. *See* William Ryberg, *Growers of Biotech Corn Say They Weren't Warned*, DES MOINES REG., Oct. 25, 2000, at 1A.

61. *See* Teel, *supra* note 17, at 651.

62. *See generally id.* (determining that the most recent embodiment of GEO debate in the EU focused on whether products should be labeled when derived from GEOs).

63. *See id.* (admitting that while the EU resists GEOs because of their traditional agricultural approaches and health concerns, the first genetically engineered crops produced in the United States in 1994 were well received).

B. *Environmental Concerns*

Opponents of GE products also fear that biotech varieties may create antibiotic resistance to bacteria, turning ordinary weeds into "superweeds."[64] There are concerns that GE species may overcome existing plants and animals thus disrupting the ecosystem.[65] Environmental effects like those seen from the Bacillus thuringiensis ("Bt") corn hybrids, such as *StarLink*, substantiate the widespread and long lasting public resistance to GEOs.[66] Consequently, Bt corn and other enhanced seed systems require approval before they can be marketed.[67] No matter, consumers, marketers, and importers remain wary, as they are concerned with associated risks. However, along with the environmental concern is the argument that plants and insects might create antibiotic resistant bacteria.[68]

1. *Pest Evolution*

Pest evolution and resistance is a significant concern.[69] While biotech companies assure consumers and farmers that risks of evolving pests are easily controlled,[70] there is a substantiated belief that pests, such as the EC Borer, a European corn insect, may develop a resistance to pesticides contained in certain seed.[71] Pest resistance has been an acknowledged fact of agricultural and biotech life since petroleum-based pesticide was introduced.[72] Fears of pest resistance are based upon valid concerns that insects might become resistant to toxins such as those produced by Bt corn.[73] However, proponents of GE varieties contend that without biotech advancement pesticides provide a greater harm to the environment.[74] Nonetheless, despite the pest evolution trepidations, Bt corn and others like it are becoming increasingly popular.[75] While this is certainly good news for the companies who sell

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64. *See* Anthan, *supra* note 59, at 4A.
65. *See* Hamilton, *supra* note 23, at 104-05.
66. *See id.* at 95.
67. *See* Teel, *supra* note 17, at 661-62.
68. *See* Dunn, *supra* note 13, at 154.
69. *See* RIFKIN, *supra* note 14, at 84.
70. *See* Teel, *supra* note 17, at 653.
71. *See generally* Brian DeVore, *Making Ag a Lean, Mean, Gene Machine—Is Genetic Engineering's Arrival in Farm Country the End of a Successful Marketing Effort, or the Beginning of a Huge Experiment?*, 18 LAND STEWARDSHIP LETTER NO. 1 (Land Stewardship Project), Jan.-Mar. 2000, *available at* http://www.landstewardshipproject.org/lsl/lspv18nl.html (stating that in fact 500 pests have built a resistance to pesticides in the past years since the introduction of pesticide).
72. *See id.*
73. *See* Dunn, *supra* note 13, at 154.
74. *See* DeVore, *supra* note 71.
75. *See id.*

the seed, it may be very bad news when considering the development of pest resistance.[76]

2. *Monarch Butterfly*

Bt corn was given national attention when a study conducted by Cornell and Iowa State University reported that the corn milkweed harmed Monarch butterflies.[77] These studies concluded that the Bt corn pollen might be a toxin to the Monarch butterfly caterpillar.[78] While there was no conclusive evidence, there had been an ongoing debate regarding the harm.[79] While some research concluded that the Bt corn pollen could kill the caterpillar,[80] other research indicated that field studies showed that the corn pollen did not harm the Monarchs.[81]

C. *Consequences of These Concerns*

The culmination of diverse concerns, from health to super weeds and monster pests, does more than just point the finger in the direction of biotech products.[82] Critics of biotechnology cite "potential toxic and allergenic reactions in humans," pesticide evolution and antibiotic development in plants and insects, and a global loss of biodiversity as "reasons for exercising caution in the development and use of GMOs."[83] While biotechnologists argue that biotechnology is simply human intervention in everyday natural processes, many others contend that the "devil awaits release in the DNA details."[84] However, these fears are in part based upon conjecture and supposition.[85] In the end, unfounded concerns take away the biotech advantage that farmers rely upon, and that consumers demand.

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76. *See id.* (citing Bob Hartzler, Iowa State University extension weed specialist, stating that, "[t]he more you use a product, the more potential for developing resistance to it.").

77. *See* Carol Kaesuk Yoon, *Altered Corn May Imperil Butterfly, Researchers Say,* N.Y. TIMES, May 20, 1999, at A1.

78. *See Recent Study Suggests Bt Corn Toxic to Butterflies*, FEEDSTUFFS, Aug. 28, 2000, at 5 (hereinafter *Bt Corn*).

79. *See* Allison Ballard, *Chain of Foods?; Genetically Modified Foods: Are We Creating a Monster or Making Life Better?*, MORNING STAR, Sept. 20, 2000, at 1D, 4D; *see also* Tina Hesman, *EPA Renews Licenses on Biotech Corn Produced by Monsanto; Some Advocacy Groups Want More Studies on Health, Nature Effects*, ST. LOUIS POST-DISPATCH, Oct. 17, 2001, at B1.

80. *See supra Bt Corn*, note 78, at 5.

81. *See* Mark K. Sears, et. al., *Impact of Bt Corn Pollen on Monarch Butterfly Population: A Risk Assessment,* PNAS EARLY EDITION, *available at* http://www.pnas.org/cgi/doi/10.1073/pnas.211329998 (last visited Jan. 28, 2002). *But see, Bt Field Study,* CHEMICAL WEEK, Aug. 23, 2000, at 49.

82. *See* RIFKIN, *supra* note 14, at 83-90.

83. Repp, *supra* note 8, at 587.

84. DeVore, *supra* note 71.

85. *See id.*

IV. CROP CONTAMINATION

Crop contamination is likely the GE and non-GE farmers' paramount concern with the greatest legal consequences. Unwanted cross-pollination results in major economic damage to non-GE crops.[86] There is clearly the possibility of GE crops cross-pollinating with non-GE crops.[87] As well, crop contamination may occur in a variety of ways:[88] from genetic drift in the first stages of the crop life, to commingling during harvest and distribution, to the possible misuse of unapproved varieties of GE products.[89] Sadly, it is not so simple to state that a specific crop or a specific amount of grain is certainly GEO or non-GEO.[90] A homogenous GEO is difficult to accomplish due to the uncontrollable circumstances surrounding agricultural production. This becomes clear when considering the different methods of grain production, as well as seed companies' concessions that some of the non-GE seed they are selling contain low levels of germ plasm.[91]

A. *Genetic Drift*

Genetic pollution is easily the most intellectually stimulating legal issue facing GEOs today.[92] Because of the many natural occurrences, such as wind, insects, and animals, farmers are burdened with the fear that segregation of GE and non-GE crops is not enough to prevent inadvertent cross-pollination.[93] Genetic drift is the

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86. *See* Repp, *supra* note 8, at 591.

87. *See id.* at 591-92. *See, e.g.*, Taylor, *supra* note 52, at 15A (stating that based on the mistakes surrounding *StarLink* no commodity crop should ever be allowed on the market without regulatory assurance that it is safe for human consumption); Dorothy Nelkin et al., *Foreward: The International Challenge of Genetically Modified Organism Regulation*, 8 N.Y.U. ENVTL. L.J. 523 (2000) (stating that the risks of GEO products are "a matter of intense domestic and international controversy"); *see, e.g.*, DeVore, *supra* note 71, *available at* http://www.landstewardshipproject.org/lsl/lspv18nl.html (stating that genetic engineering creates a very aggressive pollinator and that the DNA details combined with genetic drift is a great concern); *Corn Farmers Sweat GMO Segregation*, 28 INDUS. IN TRANSITION 3 (July 1, 2000), *available at* 2000 WL 16194700.

88. *See* Harl, *supra* note 26, at 145-46 (stating that beyond pollen drift, mechanical contamination in augers, wagons, storage bins, combines or even in the conveyors used to ship the grain, commingling and contamination may occur), *available at* http://www.ngca.com/biotechnology/know_where/know_grow_guidelines.html.

89. *See id.*, *available at* http://www.ngca.com/biotechnology/know_where/know_grow_guidelines.html.

90. *See id.*, *available at* http://www.ngca.com/biotechnology/know_where/know_grow_guidelines.html.

91. *See id.* at 145, *available at* http://www.ngca.com/biotechnology/know_where/know_grow_guidelines.html.

92. *See* Hamilton, *supra* note 23, at 82.

93. *See* Harl, *supra* note 26, at 145, *available at* http://www.ncga.com/biotechnology/know_where/know_grow_guidelines.html.

intermixing of pollen by air or animal during the time of pollination.[94] The "drift" from the pollinating plant varieties is carried through the air by use of wind to other pollinating crops.[95] Natural forces can carry plant pollen for up to six miles without warning.[96] According to the director of Iowa State University Office of Biotechnology, "a single field of bio-engineered corn can contaminate fields of conventional corn over a wide area."[97] For example, a farmer may chose not to plant StarLink corn, but if his or her neighbor chooses to grow that variety, the farmer may have a serious problem preventing that variety from entering the crop.[98] Without barricades, pollen drift has been an increasingly difficult issue for organic farmers as they worry about inadvertent drift from neighboring fields containing GE crop varieties. As the numbers of both organic and GE farms increase so does the potential for crop contamination.[99] The primary concern is that a local GE crop will commingle and contaminate another crop, thus rendering the grain worthless.

One of the main culprits lending a hand to cross-pollination is *force majeure* (Act of God).[100] *Force Majeure* applies where unforeseen, major and uncontrollable forces, such as weather and animal activity, change the circumstances of an agreement.[101] With the possibility of genetic drift, animal contamination, or potential commingling, neighboring crop farmers can do little to stop "acts of God."

However, even with the uncontrollable opportunities, there are certain precautions that can be exercised in an effort to reduce natural cross-pollination.[102] Certain options include: proscribing distances between crop varieties, and building physical barriers such as walls or netting.[103] While seed companies and manufacturers contend that genetic drift contamination is an uncontrollable and unforeseeable result, given the "agronomic and environmental factors at play," the reality is that unforeseeability will be difficult to prove.[104]

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94. *See* Mandler & Eads, *supra* note 27, at 1.

95. *See id.*

96. *See* Anthan, *supra* note 1, at 1A.

97. *Id.*

98. *See id.* (citing Iowa State University agronomist Walter Fehr using a hypothetical to describe why separating farmers into those who plant bio-engineered seeds and those who do not is becoming increasingly meaningless).

99. *See* Kathleen Merrigan, Remarks to the National Organic Standards Board (Mar. 22, 2000), *at* http://www.ams.usda.gov/nop/nop2000/kathleensresponse1.htm.

100. *See* Mandler & Eads, *supra* note 27 at 1, 5.

101. *See id.*

102. For example barriers and buffers could be constructed in order to separate the different fields. *See* Teel, *supra* note 17, at 653.

103. *See id.* (suggesting that by planting traditional plant varieties as buffers, farmers could create a buffer zone or even a refuge for non-resistant insects).

104. Mandler & Eads, *supra* note 27, at 1, 5.

B. *Commingling*

Crop commingling is yet another way in which contamination occurs during and after the harvesting.[105] Commingling occurs when two distinctly different seeds or grains, whether GE or non-GE, are mixed together.[106] There are clear and certain points where contamination may occur.[107] Commingling often arises because of grain mishandling errors, which frequently occur because of misinformation or mislabeling.[108] The probability of contamination accordingly creates significant distress in the ecological, economic, and health based arenas. The results of contamination are often devastating to the farmers, consumers, and grain importers.

C. *Mishandling*

Even in the event that crops are not cross-pollinated during growth or inadvertently commingled in the harvest, there still remains the possibility of cross-contamination or intermixing after crops have been harvested.[109] Commingling, grain mixing in the elevator, and mishandling during export are all times when GE and non-GE grains may intermix.[110] In fact, "[p]roducers who do not knowingly plant any form of GM seed might still have crops yield positive tests if the crops are contaminated by GM pollen that drifted in from neighboring fields."[111]

Mishandling of the crop during and after harvest is also a sure way to contaminate the shipment.[112] For example, during harvest a piece of machinery may have trace amounts of an unapproved grain lingering, from a prior harvest, in the pieces. If that is the case, it is likely that the trace amounts will mix with the current harvest. If the current approved grain is mixed with the unapproved grain, the crops' marketability may be permanently altered. This was the case in the *StarLink* saga. If a grower intends to plant a crop consisting of a specified variety, the farmer should thoroughly clean the equipment prior to use. Additionally, once the crop has been harvested, there still remain many instances during which grains may become intermixed.[113] Consequently, if a collection of grain is not labeled according to its GE

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105. *See* Redick & Bernstein, *supra* note 12, at 10,329.

106. *See id.*

107. *See generally* Keller & Miller, *supra* note 3, at 24-26 (discussing the regulations involved in growing *StarLink*).

108. *See generally id.* at 24 (explaining that farmers were unaware that *StarLink*, a hybrid corn variety sold for animal consumption, should have been kept separate from other grains).

109. *See generally* Hannelore Sudermann, *Genetically Altered Wheat Flagged: Thailand Detects Shipment Not Cleared for Commercial Sales*, THE SPOKESMAN REV., Oct. 14, 1999, at A1 (discussing the unknown origin of contamination of a grain shipment to Thailand from the Pacific Northwest).

110. *See* Hamilton, *supra* note 23, at 104.

111. *Id.*

112. *See* Redick & Bernstein, *supra* note 12, at 10,329.

113. *See* Harl, *supra* note 26, at n. 19 145-46, *available at*

consistency, it becomes exponentially probable that the grain will be mixed with other grain varieties during transport. The good news is that there are ways in which to prevent mishandling and subsequent contamination. First, all mechanical equipment including transport vessels should be maintained in a clean fashion. Second, it is essential that all varieties of crops be labeled accordingly. Finally, handlers must painstakingly maintain awareness of the GE and non-GE crops and ensure that they are processed and stored in appropriate elevators. This however, is not as easy to accomplish, as it is to recognize.

V. THE *STARLINK* DISASTER

StarLink poses an excellent example of what may come of the concerns regarding biotechnically-altered products.[114] *StarLink* was a genetically enhanced variety of corn used to combat the Bt borer, the European caterpillar that destroys corn stalks. Yet, it had not been approved for human consumption because of human health concerns.[115] In fact, *StarLink* corn was the only GE product on the market not approved for human consumption.[116] *StarLink* is made by inserting Cry9C into the *StarLink* seed through genetic engineering, and used to extinguish the corn borers.[117] Aventis sold the product to farmers under the brand name *StarLink*,[118] and approximately one year ago, traces of the biotech seed *StarLink* were found in corn products throughout the nation.[119] Unregulated guidelines and mislabeled or unlabeled *StarLink* seed led to the resulting biotech corn invasion.[120] The consequences of the crop contamination were felt world wide in the aftermath of the *StarLink* mix-up.[121] With concerns and criticisms already afoot, the *StarLink* episode did little to advance consumer GEO confidence. In fact, significant declinations in exports have been connected to the *StarLink* incident.[122] Despite subsequent efforts to keep *StarLink* under control and out of approved products many importers have discontinued importation of any product that is not certified "*StarLink* free."[123] For example, the South Korean government refuses to accept corn and other processed food shipments that are not certified *StarLink* free.[124] The European markets fear GEO contamination

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http://www.ngca.com/biotechnology/know_where/know_grow_guidelines.html.

114. *See* Anthan, *supra* note 1, at 4A.
115. *See* Marlene Lucas, *Exchange Corn Fears*, ASSOC. PRESS NEWSWIRES, Feb. 1, 2001.
116. *See* Keller & Miller, *supra* note 3, at 24, 25.
117. *See* Leys, *supra* note 5, at 1D.
118. *See* MacNamara, *supra* note 2, at 4.
119. *See* Matt Crenson, *StarLink Story is Chain of Failures*, DES MOINES REG., Dec. 3, 2000, at 1D.
120. *See id.*
121. *See* Lucas, *supra* note 115.
122. *See* Anthan, *supra* note 1, at 1D.
123. *See* MacNamara, *supra* note 2, at 4.
124. *See id.*

as well, and ensuing debates have determined that they will resist all genetically altered or engineered products.[125]

According to some critics, Aventis should not have brought the corn variety into the market without the full approval of the FDA, and federal regulations should never have approved *StarLink* for animal feed that was not approved for human consumption.[126] It was seemingly inevitable that cross-pollination or commingling would occur.[127] The opportunity for mistakes in handling, misidentification, and crop distance were all potential shortcomings in the effort to keep this variety separate from others. Nonetheless, Aventis eventually signed an agreement with seventeen state attorneys general to reimburse farmers.[128] Farmers who relied on the outcome of their corn crops faced massive damage as a result disaster.[129] As a result of subsequent crop damage, Aventis paid out about $0.25 over local prices per bushel in an effort to keep it off the market.[130] It does not stop there, however, because in October 2000, the Environmental Protection Agency ("EPA") urged Aventis to announce that it would cancel the registration of *StarLink* variety corn.[131] The announcement meant that *StarLink* could not be planted in United States soil for any agricultural reason.[132]

The *StarLink* fiasco raised a litany of legal questions on the subject of liability.[133] According to Neil Hamilton, Professor of Law and Director of the Drake University Law School Agricultural Law Center, "[w]hen the history of biotechnology is written, the [*StarLink*] corn episode could be the watershed event that precipitates major changes in America's attitudes and policies towards biotechnology."[134] Approximately 3,000 farmers planted about 350,000 acres with *StarLink* during the 2000 growing season.[135] This was a substantial increase from the 215,000 acres the year before and the 10,000 acres the year before that.[136] So what prevented anyone, particularly the marketers, from seeing what was coming? Well, according to reports, some did have foresight and attempted to convince the National Corn Growers Association.[137] No matter, that which was feared occurred. Farmers who relied on the

125. *See id.*
126. *See* Taylor, *supra* note 52, at 15A.
127. *See id.*
128. *See* Richard Gibson, *Iowa Suit Filed Against Aventis Unit Over Engineered Corn*, DOW JONES NEWS SERVICE, Feb. 6, 2001.
129. *See id.*
130. *See* Lucas, *supra* note 115 at 01:51:00; *see also* MacNamara, *supra* note 2, at 4 (stating that Aventis announced in September of 2000, that it would purchase the 2000 crop of *StarLink* corn in order to prevent further cross-contamination and extensive economic harm to corn growers using this product).
131. *See* MacNamara, *supra* note 2, at 4.
132. *See id.*
133. *See* Ryberg, *supra* note 60, at 13A.
134. Hamilton, *supra* note 39, at 9A.
135. *See* Keller & Miller, *supra* note 3 at 24, 26.
136. *See id.* at 26.
137. *See id.*

outcome of their corn crops faced massive economic and legal damages as a result of the commingling.[138] It doesn't stop there, however, because in October 2000, the EPA urged Aventis to announce that it would cancel the registration of *StarLink* variety corn.[139] The announcement meant that *StarLink* could not be planted in United States soil for any agricultural purpose.[140]

VI. TORT THEORIES OF RECOVERY

Fortunately, within the American legal system there are certain and promising remedies available to individuals harmed as a result of GEOs.[141] Individuals, who endure property damage and economic damage, may file suit under various theories, including negligence, nuisance, trespass, breach of contract, strict liability and products liability.[142] Any one of these tort remedies to recover for damages endured by farmers due to crop contamination may still offer hope to those farmers, consumers, and producers who are becoming more and more wary of GE crops. The legal issues stem from property damage and economic harm resulting from the release of GEOs into the unwanted arenas.[143]

Because GEOs have seen a steady rise in the United States agricultural community,[144] there has been increased legal exposure, as witnessed in the *StarLink* incident.[145] More than one third of the corn grown in 1999 was genetically engineered, and more than half of the soybeans were genetically engineered.[146] Early examples of actual damages resulting from production of GE crops reveal that there is legitimate cause for farmer concern.[147] Substantial economic losses have surfaced because of GE crop-contamination.[148] Thus the farmer, the importer, and the

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138. *See* Lucas, *supra* note 115; *see also* MacNamara, *supra* note 2, at 4.

139. *See* MacNamara, *supra* note 2, at 4.

140. *See id.*

141. *See, e.g.*, Graham v. Canadian Nat'l Ry. Co., 749 F.Supp. 1300, 1317-18 (D. Ver. 1990) (discussing nuisance and negligence liability as remedies for drift issues); *see also* J.W. Looney, *Serving the Agricultural Clients of Tomorrow*, DRAKE J. AGRIC. L. 225, 226-27 (stating that strict liability is a potential remedy for injured parties when dealing with GEOs); RESTATEMENT (THIRD) OF TORTS: PRODUCTS LIABILITY § 1 (1998) (hereinafter RESTATEMENT THIRD).

142. *See* Mandler & Eads, *supra*, note 27, at 1. While this note will focus mainly on the tort theories of nuisance, negligence, trespass, strict liability and breach of contract, other theories include: negligent manufacture, testing, or design; negligent failure to warn; breach of express warranty; breach of the implied warranties of merchantability and fitness for a particular purpose; and breach of the covenant of good faith and fair dealing. *See id.; see also* Repp, *supra*, note 8, at 599.

143. *See* Looney, *supra* note 141, at 226.

144. *See* DeVore, *supra* note 71.

145. *See* Hamilton, *supra* note 39, at 9A.

146. *See* DeVore, *supra* note 71.

147. *See* Repp, *supra* note 8, at 590.

148. *See* Kathy Bergstrom, *Lawsuit: StarLink Damaged Market Some Farmers Find Difficulty Selling Their Corn Harvest This Fall*, DES MOINES REG., Dec. 5, 2000, at Business 1, *available at* 2000 WL 4984203; *see also* Gibson, *supra* note 128, at 14:47:00 (stating that the initial Iowa Corn Grower's

consumer feel the economic loss. Property damage and economic loss are the greatest potential damages associated with GEOs. As a result, changes in agricultural and biotechnological advances are sure to create legal issues.[149]

A. *Trespass*

Trespass is the invasion of a possessor's interest in the exclusive possession of land.[150] Trespass occurs where there is actual invasion of a possessor's property. There are two types of trespass: negligent trespass and intentional trespass.[151] When the entry upon land is negligent, proof of some actual damage is essential to the cause of action.[152] When a trespassory invasion is found, the fact that defendant's conduct was socially useful or even beneficial to the possessor does not affect liability.[153] "Where there is evidence of actual damage to [possessor's] property, the size and magnitude of the invasive substance appears to be irrelevant."[154] The elements of trespass are: (1) invasion of plaintiff's possessory interest in property; (2) caused by defendant's act or omission; (3)resulting in damages to property.[155] The landowner must prove that there has been a physical invasion or interference with the exclusive possession of property.[156]

It may be difficult to meet the causation standard of the trespass elements to prove that the contamination came from a particular defendant. However, with the current level of technological procedure, there is strong support and capability to determine from investigation of the seed variety to determine the specific type of seed that did contaminate the crop. It is certainly possible and definitely essential to prove that the invasion and subsequent contamination did in fact occur. According to the Supreme Court of Washington,

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suit blamed Aventis for causing "massive economic losses due to sharp decline in the price of a bushel of corn").

149. *See* Looney, *supra* note 141, at 226.

150. *See* KEETON ET AL., PROSSER AND KEETON ON THE LAW OF TORTS § 13, at 67 (5th ed. 1984).

151. *See* RESTATEMENT (SECOND) OF TORTS §§ 163, 165 (1965) (hereinafter RESTATEMENT SECOND).

152. *See id.* at § 165.

153. *See* Longenecker v. Zimmerman, 267 P.2d 543, 546 (Kan. 1954) (stating that it does not matter if trespasser actually benefited the property); Harmony Ditch Co. v. Sweeney, 222 P. 577, 579 (Wyo. 1924).

154. Repp, *supra* note 8, at 601.

155. *See id.* at 600.

156. *See, e.g., Bradley*, 709 P.2d at 790 (stating if the intrusion interferes with the right to exclusive possession of property, the law of trespass applies); *see also* Martin v. Reynolds Metals Co., 342 P.2d 790, 792 (Or. 1959).

> It is quite possible in an earlier day when science had not yet peered into the molecular . . . world of small particles, the courts could not fit an invasion through unseen physical instrumentalities into the requirement that a trespass can result only from a direct invasion. But in this atomic age even the uneducated know the great and awful force contained in the atom and what it can do to a man's property if it is released. The force is just as real if it is chemical in nature and must be awakened by the intervention of another agency before it does harm.[157]

In order to prove that the named defendant actually caused the plaintiff's damages, testing likely will be necessary to link the GEO contamination to the infected property.[158]

Crop contamination is unquestionably a property damage issue. Although negligence and nuisance claims have been the most common methods of resolving and recovering from agricultural property damage, trespass may serve as a better claim for the specific issue of genetic drift and animal contamination. Trespass claims are generally used for cases involving airborne contaminants and, thus, more on point with the genetic drift issue.[159] Whatever theory of liability is pursued, the complainant must prove that the defendant's wrongful conduct was in fact the cause of the injury.[160] If a grower's non-GEO seed is cross-pollinated by an unapproved GEO, the customer might bring an intentional tort claim against the seed manufacturer for the deliberate release of a non-approved GEO. Nonetheless, the customer will have to show some level of injury, such as loss of marketability, in order to prevail in the legal system. A simple low-level presence of GEOs may not be enough for farmers who are still able to sell their crop within the United States unless they are able to present the court with a substantial dichotomy between the buying price of the overseas market and the local market. As revealed with *StarLink*, there was clearly a difference between prices. Further, because the crop growers are faced with an export market that may easily reject shipments due to contamination, damages are likely to be present.

B. *Nuisance*

Nuisance is defined as an actionable invasion of a possessor's interest in the use and enjoyment of their property.[161] Unwanted intrusions to property that negatively affect the ability to enjoy the property may have a cause of action against the intruder. Nuisance law is broken down into two separate causes of action: private

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157. *Bradley*, 709 P.2d at 788 (citing W. ROGERS, ENVIRONMENTAL LAW § 2.13 (1977)).

158. *See Graham*, 749 F. Supp. at 1318 (holding that evidence failed to establish that herbicide applications proximately caused harm to landowner's property and therefore landowners could not recover); *see also* Repp, *supra* note 8, at 603.

159. *See* KEETON ET AL., *supra* note 150, §3, at 18-19; Repp, *supra* note 8, at 601-02.

160. *See* Repp, *supra* note 8, at 600-05.

161. *See* RESTATEMENT SECOND, *supra* note 151, at § 822.

nuisance and public nuisance.[162] Private nuisance protects the individual property owner's right to the use and enjoyment of the land.[163] It is therefore tied firmly to the use of land. One is subject to liability for private nuisance if their conduct is a legal cause of invasion of another's interest in the, "private use and enjoyment of land . . .."[164] However, private nuisance liability may not provide the impact or remedy sought by the damaged farmer or consumer. Whereas public nuisance is a broad remedy in tort law and is used more effectively to protect the common rights of all members of a community.[165] The Restatement (Second) of Torts defines public nuisance as follows:

> (1) A public nuisance is an unreasonable interference with a right common to the general public.
>
> (2) Circumstances that may sustain a holding that an interference with a public right is unreasonable include the following:
>
> (a) Whether the conduct involves a significant interference with the public health, public safety, the public peace, the public comfort or the public convenience, or
>
> (b) Whether the conduct is proscribed by a statute, ordinance or administrative regulation, or
>
> (c) Whether the conduct is of a continuing nature or has produced a permanent or long lasting effect, and, as the actor knows or has reason to know, has a significant effect upon the public right.[166]

In certain jurisdictions that allow private individuals to bring public nuisance suits while acting as a citizen attorneys general, one action can bring both public and private nuisance suits, if the landowner is able to allege a "special injury" apart from that of the public interest affected.[167] In order to recover damages using public nuisance the harm must be proven.[168]

The threat posed by the sale of unapproved varieties of GE seeds is well suited for an injunction under public nuisance law. The failure to create absolute barriers to cross-pollinating or commingling of unapproved varieties is disastrous. The result of such a failure could lead to what is called the "One Bad Apple" effect, in which a single unapproved GEO commingled with another crop would result in the

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162. *See id.* at § 821A.
163. *See id.* at § 822.
164. *Id.*
165. *See* Redick & Bernstein, *supra* note 12, at 10,334.
166. RESTATEMENT SECOND *supra* note 151, at § 821B.
167. *See* Redick & Bernstein, *supra* note 12, at 10,335.
168. *See* RESTATEMENT SECOND, *supra,* note 151, at § 821C.

rejection of the entire product because of contamination.[169] Public nuisance law enables the farmer or processor to seek redress in a court of law so long as it is proven that the threat is continual.

Nuisance law holds a polluter whose conduct is the legal cause of physical harm inflicted on the property interests of the complainant subject to liability.[170] A property owner is not guaranteed immunity from suit for injuries caused by natural conditions.[171] In the end, liability depends on conduct that either directly and unreasonably interferes with one's property or creates a condition that interferes with the property.[172] With that in mind, if the property owner whose crop cross-pollinates with another's crop can be shown to have been the actual cause of such contamination, the tort theory of nuisance would likely apply. The difficult part will be proving that it is indeed the alleged intruder whose crops actually took part in the cross pollination. Careful research, however, should indicate the type of intruder, and thus direct the victim to the damaging crop.

C. *Negligence*

Negligence is yet another common law remedy for damage to crops as a result of GEO contamination. The required elements to establish a cause of action in negligence include a duty, a breach, causation, proximate cause, and actual injury.[173] Proving these elements will be very difficult as pollen-drift and general contamination are non-tangible issues. Liability is based on the idea that one owes a duty to another and breaches that duty.[174] When addressing the damages sustained by a farmer as a result of crop contamination by a GE crop, courts will consider whether the infiltrating farmer constructed a buffer zone so as to contain his crop.[175] It is reasonably foreseeable that the invasion would likely damage the farmer's property marketability.

Once the breach of duty is shown, the injured farmer must show causation by demonstrating that their injuries are a direct and proximate cause of the defendant's

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169. *See* Redick & Bernstein, *supra* note 12, at 10,334. This is a theory suggesting that importing countries would reject an entire shipment of grain with strict regulations on GEOs. *See id.* Several hundred million dollars in trade with the European Union has already been lost due to contamination of unapproved varieties of United States corn. *See id.*

170. *See* Graham, 749 F. Supp. at 1317.

171. *See generally* Lussier v. San Lorenzo Valley Water Dist., 253 Cal. Rptr. 470, 473 (Cal. Ct. App. 1988) (quoting from *Richardson v. Kier*, 34 Cal. 63, 73 (1867), that the basic concept of underlying law of nuisances is the ancient maxim "*sic utere tuo ut alienum non laedas*" to use your own property as not to injure another's property).

172. *See* RESTATEMENT SECOND, *supra* note 151, at § 822 cmt.a; *see also* Lussier, 253 Cal. Rptr. at 473.

173. *See* Lewis, *supra* note 42, at 180.

174. *See* Maryland Heights Leasing, Inc. v. Mallinckrodt, Inc., 706 S.W.2d 218, 223 (Mo. Ct. App. 1985).

175. *See* Repp, *supra* note 8, at 615.

actions or lack thereof.[176] This will likely be the most difficult to prove. In the context of an action for negligence, actual scientific proof of damage is essential to eliminate the possibility of mere conjecture and speculation.[177] When the causal relationship between negligent conduct in handling dangerous substances and final harm is not obvious to the ordinary lay person, expert opinion evidence in the field of botanical science and chemistry is essential to establish a legal cause of action from the exposure to harmful substances resulting in injury.[178] When expert testimony is required on the issue of causation, the standard of proof applied is proof to a reasonable degree of scientific certainty.[179] A reasonable degree of certainty will be required when the causal relationship between the negligent conduct and the resultant harm is obscure.

D. *Strict Liability*

As we encounter the genetic changes and vast expansion in agriculture, strict liability will deal with the *deliberate* release liability for abnormally dangerous activities when injury occurs.[180] Section 520 of the Restatement of Torts sets out the factors to be considered when determining abnormally dangerous activities. The factors include:

(a) Whether the activity involves a high risk of some harm to the person, land or chattels of others;
(b) Whether the gravity of the harm which may result from it is likely to be great;
(c) Whether the risk cannot be eliminated by the exercise of reasonable care;
(d) Whether the activity is not a matter of common usage;
(e) Whether the activity is inappropriate to the place where it is carried on; and
(f) The value of the activity to the community.[181]

In the case of GEOs, there is certainly the issue of the abnormally dangerous quality of engineered organisms, and thus the question of strict liability for the intentional and knowledgeable release of a harmful product will be certain.[182]

While the modern rule of strict liability would appear to provide a remedy for damages resulting from GE seeds, crops and products, if the harmful thing is considered a living organism, some jurisdictions will not allow this cause of action.[183] Therefore, the central question when considering whether strict liability is an

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176. *See id.* at 616.
177. *See* Graham, 749 F. Supp. at 1319.
178. *See* Graham, 749 F. Supp. at 1318.
179. *See* Sterling v. Velsicol Chemical Corp., 855 F.2d 1188, 1199-1201 (6th Cir. 1988).
180. *See* RESTATEMENT SECOND, *supra* note 151, at § 520.
181. *See* RESTATEMENT SECOND, *supra* note 151, at § 520; *see also* Repp, *supra* note 8, at 617.
182. *See* Looney, *supra* note 141, at 226.
183. *See id.* at 227.

appropriate remedy for damages stemming from GEOs, is whether the particular GEO is a "living organism." While the issue of living organism may be overcome by showing that a GE product is both defective and unreasonably dangerous, there is still the issue of proof of damages.

Farmers may find it difficult to prove physical harm to the user, consumer or to the property. [184] Restatement (Second) of Torts discusses the elements of strict liability for living organisms. The first element of strict liability is the existence of a high degree of risk of harm.[185] The grower of a crop that becomes cross-pollinated will find refuge and remedy if they cast the sale and distribution of such "seed as an unreasonably dangerous activity and bring a claim alleging strict liability in tort."[186] Strict liability will tolerate punitive damages sought in this legal arena so long as physical harm can be proven, an abnormally dangerous level is concluded, and the court determines whether a GE seed is indeed a "living organism."[187] Moreover, because of the difficulty in showing that an activity meets the criteria in section 520 of the Restatement Second of Torts for an "abnormally dangerous activity, '[s]trict liability has not been used as frequently [as other theories] as a basis for recovery.' However, in situations where an activity is considered abnormally dangerous, it is unnecessary to show fault if the court follows a strict liability concept."[188] This may ensure a successful plaintiff the ability to collect money for damages against a defendant who has caused economic loss.[189]

The *StarLink* fiasco could fall into the abnormally dangerous activities category. Therefore, claims such as those brought about in response to the *StarLink*, may conform to a strict liability scenario. In fact, "[a]ctivities that have a high likelihood of causing uncontrollable damage generally qualify as abnormally dangerous activities."[190] Specifically, if the damage caused by *StarLink* were connected to genetic drift, and the plaintiff could present sufficient evidence of the destructive and abnormally dangerous capacity of *StarLink*, a court might likely determine that the strict liability analysis fits.[191] The court could look to determine

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184. *See id.*

185. *See* RESTATEMENT SECOND, *supra* note 151, at § 520.

186. Mandler & Eads, *supra* note 27, at 1.

187. *See* Looney, *supra* note 141, at 227.

188. Repp, *supra* note 8, at 227 (quoting J.W. Looney, Rylands v. Fletcher *Revisited: A Comparison of English, Australian and American Approaches to Common Law Liability for Dangerous Agricultural Activities*, 1 DRAKE J. AGRIC. L. 149, 152 (1996)).

189. *See id.* at 617.

190. *Id.* at 618.

191. *See id.* at 618; *see generally* Langan v. Valicopters, Inc., 567 P.2d 218 (Wash. 1977) (holding a defendant who over sprayed pesticide which affected an organic farmers crop, strictly liable for the damage caused by the pesticide drift). The court first concluded that aerial spraying involves a high degree of risk; second that drifting pesticides would be very damaging to an organic farmer; third, that the uncontrollability of dust or spray drift could not be eliminated; forth, that crop dusting was not a matter of common usage because it was used by so few people; fifth, that land adjacent to an organic farming operation was an improper place for aerial spraying; and sixth, that while pesticides were

whether (1) the *StarLink* or other GE crop involved a high degree of risk because of uncontrollable scenarios; (2) the gravity of harm to another grower would be damaging on the marketability basis; (3) the uncontrollability could be eliminated, even with proscribed procedures; (4) it was a common usage; (5) the appropriateness of the risk based upon the adjacent land; and (6) a balancing between damage to the plaintiff and accepted societal interests in GEOs.[192] A court might easily find against Aventis' *StarLink* and others on the basis of strict liability after addressing these six factors.

E. *Products Liability*

Products liability may easily be the primary legal remedy against the larger GE distributors. The imposition of liability for manufacturing defects has long been around and used by the courts in common law application.[193] A seed engineering company that sells or distributes altered seed may face the inevitable suit for product liability. A company engaged in selling a product that is defective, whether it is defective in design or it is defective on the basis of inadequate instructions or warnings, is subject to liability for damages.[194] According to the commercial seller's liability for harm caused by defective products, section one of the Third Restatement of Torts states, "[o]ne engaged in the business of selling products who sells a defective product is subject to liability for harm to persons or property caused by the product defect."[195]

Issues of design defects and defects based on inadequate instructions or warnings arise when specific products conform to the intended design but such design, or its lack of instruction or warning, renders the product unsafe.[196] It was during the 1960s and 1970s that it became evident that section 402A[197] was not adequate to deal with design defects based on inadequate instructions or warnings.[198] Consequently, the Third Restatement of Torts introduced a viable remedy and cause of action for those individuals who endured damages as a result of inadequate instructions.[199] Section two of the Third Restatement of Torts states in pertinent part:

"socially valuable", "an equitable balancing of social interests" would require liability because the defendant stood to profit. Valicopters, 567 P.2d at 222-23.

192. *See* Repp, *supra* note 8, at 619.

193. *See generally* RESTATEMENT THIRD, *supra* note 141 at § 1, cmt.a (stating that the cause of action for products liability merges the concept of implied warranty, in which negligence is not required, with the concept of negligence, in which contractual privity is not required).

194. *See id.* at § 1.

195. *Id.*

196. *See id.* § 1 cmt.a.

197. *See* RESTATEMENT SECOND, *supra* note 151, at § 402A.

198. *See* RESTATEMENT THIRD, *supra* note 141, at § 1, cmt.a.

199. *See id.* at § 2.

> A product is defective when, at the time of sale or distribution, it contains a manufacturing defect, is defective in design, or is defective because of inadequate instructions or warnings. A product . . .
>
> > (c) is defective because of inadequate instructions or warnings when the foreseeable risks of harm posed by the product could have been reduced or avoided by the provision of reasonable instructions or warnings by the seller or other distributor . . .[200]

This particular section allows the farmer or consumer to hold biotechnology manufacturers and distributors liable for a failure to adequately provide instructions or warnings. As in the case of *StarLink*, this cause of action would assist the farmers affected by the decrease in crop marketability because the seed distributor failed to provide any instruction or warning.[201] Therefore, when a legal reaction to sustained damages is based on a defect in the product, or a failure to warn, the tort theory of products liability is a viable cause of action.

VII. SOLUTIONS AND RECOMMENDATIONS

At present, the approach to countering the effects of crop contamination is by way of private suits and contractual agreements.[202] Because few states actually have enacted statutes to address the damages resulting from GEO use, victims have been made to rely on the general common law tort theories.[203] While the United States depends on agricultural biotechnology as a world savior, there is little done to relieve the damaged farmer or consumer when the result produces harm. On the other hand, there is hope for the farmers and consumers of the future, not only in common law tort theories, but also in future legislation and continued monitoring. One such example might be a mirror of the EU directive 90/220, which is currently under proposed changes to include provisions for establishing liability for damage resulting from the release of GEOs.[204]

Labeling products with more than a negligible amount of biotech material is also a possible solution to the ongoing concerns about GEOs. However, the FDA does not require labeling so long as the non-GE counterpart is equivalent.[205] Nonetheless, GE labeling is pursued and supported by many other nations.[206]

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200. *Id.* at § 2 (c).

201. *See* Keller & Miller, *supra* note 3, at 24.

202. *See* Redick & Bernstein, *supra* note 12, at 10,330.

203. *See* A. Bryan Endres, *"GMO:" Genetically Modified Organism or Gigantic Monetary Obligation? The Liability Schemes for GMO Damage in the United States and the European Union*, 22 LOY. L.A. INT'L & COMP. L. REV. 453, 482 (2000).

204. *See id.* at 458-59; *cf. Biotechnology: France, Other EU Members to Keep Blocking Approval of New GEOs, Despite EU Directive*, INT'L. BUS. & FIN. DAILY (BNA), June 26, 2000, at D4.

205. *See* International Dairy Foods Ass'n v. Amestoy, 92 F.3d 67, 73-74 (2d Cir. 1996).

206. *See* Eric J. Lyman, *Biotechnology: Sixty-Three Nations Sign Cartegena Protocol on*

Moreover, in a move towards regulating GE products in the international market, the Cartegena Protocol on biosafety surfaced.[207] The protocol regulates GEO trade and requires exporters of genetically altered products to provide detailed information about the products.[208] It also requires labeling of GE food products.[209]

Seed manufacturer responsibility is another possible solution. Seed companies have the technological ability to create non-pollinating crops.[210] The University of Wisconsin-Madison recently discovered the solution to the genetic code that prevents cross-pollination.[211] The discovery is expected to prevent genetically engineered corn varieties, like *StarLink*, from cross-pollinating with other varieties. By inserting the built-in defense into corn varieties cross-pollination of conventional corn by GE corn will not occur.[212] Terminator technology is a genetic alteration, which entices the seed to die after one season of growth.[213] While the terminator seed is meant to prevent the farmer from saving seed, this same technology could be easily engineered to address the genetic drift scenario.[214] Seed manufacturers must be held responsible for the technology they produce. Any effort not taken on their part must be addressed.

VIII. CONCLUSION

As biotechnological advances in crop production meet the global demands for foods with higher yield and quality, so too advances the need to address legal liabilities. Remedy provisions are essential to protecting the agricultural market. The liability questions remain unanswered, however, concerning who will be responsible in the end for contamination brought about by cross-pollination or genetic drift. Additionally, there is no definitive remedy for circumstances of commingling or mishandling. We are therefore remanded with the ongoing queries. Will the liability rest with the manufacturer, farmer, or with the seed company? Who is responsible for depreciated marketability as a result of contamination? Who will pay the price in the end? No doubt, with the expanding use of GEOs in the agricultural arena, there are

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Biosafety to U.N., INTERNATIONAL BUSINESS & FINANCE DAILY (BNA), May 26, 2000, at d8 (stating that while the Cartegena Protocol is vague about liability, the scope of labeling requirements are in place).

207. *See id.*

208. *See id.*

209. *See id.*

210. *See* Jerry Perkins, *Corn Cousin Curtails Pollen*, DES MOINES REG., Dec. 17, 2000, at 1D.

211. *See id.* Teosinte is a wild cousin of corn that has a genetic makeup that prevents pollination. *See id.* They are such close cousins that geneticists expected them to cross-pollinate, yet they did not. *See id.* Due to a barrier or built in defense, the teosinte does not pollinate with corn. *See id.*

212. *See id.*

213. *See* Kahn, *supra* note 38, at 73.

214. *See id.*

sure and certain legal issues that will surface, and someone will feel the economic effects.

As GE crops become increasingly more common there will clearly be more contamination issues as opposing crops neighbor one another. This demands precautions, warnings, and further biotechnological advances. However, despite the precautions, and until advances are met, contamination will occur (similar to *StarLink* invading the food system without warning). Therefore, the legal forum must be prepared to provide remedy. Victims need an appropriate forum to seek remedy for GEO contamination. Clearly, there are remedies under the tort theories addressed in this note. While airborne pollutants and other sources of property damage have dominated much of the historical remedy, they are analogous in many regards to the issues dealt with in the biotech sector.[215] However, the severity of the issue requires more.

Remedies for the described damages already exist in the American tort laws, but to properly ensure suitable protection it will be necessary to evolve the current law and legislation to better fit the plaintiff's needs. If these needs are not met and the legal evolution is ignored, farmers will lose their crop marketability, importers will squander the introduction of better grains in their food source, and most importantly, consumers will not receive necessary products. Moreover, seed companies and manufacturers will face liability and endure significant punitive damages as a result. Remedy is the key to dealing with biotech liability. Scares, like that of *StarLink*, must first be prevented, and in the event they are not, they must be cured with legal remedy. Because if we ignore the necessary legal provisions, in the end the question of "Who will pay?" will be answered affirmatively "We *all* do."

215. *See* Repp, *supra* note 8, at 620.