WHAT LIABILITY OF GROWING GENETICALLY ENGINEERED CROPS?

Adam W. Jones

I. INTRODUCTION

Genetically engineered ("GE") crops provide a substantial benefit to farms such as disease resistance, herbicide resistance, increased nutritional value, and production of plant derived pesticides.[1] Because GE-crops require less chemical costs and produce higher yields than traditionally bred or hybrid crops, farmers have a huge incentive to grow GE-crops.[2] A hugely successful class of GE-crops is Bt, a plant-produced pesticide.[3] According to the president of Syngenta Seeds, "Farmers are using this technology because they recognize the value of targeted pest control that results in higher yields and improved environmental stewardship."[4] "In 1999, 19.8 million acres of Bt field corn and 3.5 million acres of Bt cotton were grown in the United States."[5] On October 15, 2001, the Environmental Protection Agency ("EPA") renewed approval of Bt varieties until 2008.[6] GE-crops currently account for twenty-five percent of the corn crop in the United States.[7] The variety of GE-plants and acreage of GE-crops continues to

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1. The phrase "genetically modified" or "genetically engineered" represents some genetic manipulation of an organism done without traditional breeding. Such manipulation may include transfer of a gene, removal of a gene, manipulation of a gene already in an organism, or any combination of genetic alterations in an organism. A plant with a gene alteration is known as genetically modified, transgenic, genetically modified organisms or genetically engineered ("GE"). While each term or phrase has its own unique meaning, most authors use the nomenclature interchangeably. Research indicates consumers do not understand acronyms such as "GMO" and "GM," and they prefer the full words. *See* A.S. LEVY & B.M. DERBY, CENTER FOR FOOD SAFETY AND APPLIED NUTRITION, FDA, REPORT ON CONSUMER FOCUS GROUPS ON BIOTECHNOLOGY (2000), *available at* http://vm.cfsan.fda.gov/~comm/biorpt.html (last visited Oct. 3, 2002).

2. *See* EUR. COMM'N, ECONOMIC IMPACTS OF GENETICALLY MODIFIED CROPS ON THE AGRI-FOOD SECTOR, A FIRST REVIEW, ch. 3.1.1 (Directorate General of Agriculture, Working Document Rev. 2), *available at* http://europa.eu.int/comm/agriculture/publi/gmo/fullrep/ch3.htm (last visited Nov. 4, 2002).

3. Bt varieties are plants with bacterial genes that produce proteins that act as pesticides. Such plant produced pesticides are also known as "bio-pesticides" and plant induced protection ("PIP"). Bt crops will protect plants from some pests and reduce the overall need for pesticides, but use of Bt crops will not protect the plant from all pests or eliminate the need for pesticides. The EPA currently requires refuges of non-Bt varieties to delay or prevent Bt resistance in plant pests, but those requirements are enforced indirectly through grower agreements. *See* Karen L. Werner, *EPA Conditionally Reapproves Biotech Corn for Seven Years; Additional Data Requested*, 3 Food Safety Rep. (BNA) 989, 990 (Oct. 24, 2001).

4. David Safford, *Industry Groups Praise Bt Corn Decisions, Environmental, Consumer Groups Opposed*, 3 Food Safety Rep. (BNA) 991, 991 (Oct. 24, 2001) [hereinafter Safford, *Industry Groups*] (quoting Edward T. Shansey, president of Syngenta Seeds).

5. Werner, *supra* note 3, at 990.

6. *Id*. at 989.

7. Safford, *Industry Groups*, *supra* note 4, at 991.

grow,[8] as does the amount of GE-food in the marketplace. In the future, growing GE-crops may not just be a luxury for farmers, but could become a necessity in feeding the world's hungry.[9]

Despite any benefits of GE-crops, a substantial portion of the food market refuses to buy GE-crops.[10] The European Union and many other countries have not yet approved many GE-crops for human consumption.[11] Many consumers worry that transferred proteins in GE-foods may cause allergic reactions or cause other health problems.[12] However irrational fears may be, a significant block of consumers choose to buy non-GE-foods. A market that will not accept GE-crops puts pressure on the food system to segregate GE-crops from non-GE-crops. Organic growers and companies who sell organic products must ensure that their products are GE free. Because organic food is the fastest expanding sector of the domestic food business,[13] clashes between organic growers and producers of GE-crops should only increase.

II. PROBLEMS WITH GE-CROP CONTAMINATION

A. *Federal Regulations*

The United States Department of Agriculture ("USDA") published final regulations on its procedures for organic food production on December 21,

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8. *See* Anne Fitzgerald, *Genetically Engineered Crops on the Upswing for 2002 Season*, DES MOINES REG., Mar. 31, 2002, at 40 (stating that farmers in 2002 planned to plant the most acres ever of GE-soybeans and plant more GE-corn than in 2001).

9. Susan K. Harlander, *The Evolution of Modern Agriculture and Its Future with Biotechnology*, 21 J. AM. COLLEGE OF NUTRITION 161S, 162S (June 2002) (stating that meeting the nutritional needs of the world's growing population cannot be done through traditional methods of plant breeding).

10. Rick Weiss, *In Europe, Cuisine du Gene Gets a Vehement Thumbs Down*, WASH. POST, Apr. 24, 1999, at A1.

11. *See European Parliament OKs Regulation for Monitoring, Labeling Products*, ST. LOUIS POST DISPATCH, Feb. 15, 2001, at A2 (stating that although the European Union is moving closer to ending its three year moratorium on approval of new biotech products, the ban could still be in effect for eighteen more months); Jill Carroll & Brandon Mitchener, *A Global Journal Report: Bioengineered Foods Get U.S. Boost*, WALL ST. J. EUR., Aug. 5, 2002, at A6 (discussing differences in approvals of genetically modified ingredients in Europe and the United States).

12. *See* Neil D. Hamilton, *Legal Issues Shaping Society's Acceptance of Biotechnology and Genetically Modified Organisms*, 6 DRAKE J. AGRIC. L. 81, 83 (2001).

13. *See* Ben Lilliston, *Farmers Fight to Save Organic Crops; Genetic Contamination of Organic Crops by Genetically-Modified Plants*, THE PROGRESSIVE, Sept. 1, 2001, at 26.

2001.[14] All but the smallest organic growers must be certified by a USDA accredited agent.[15] To be certified, an organic grower or producer cannot use biotechnology methods.[16] Such a requirement would theoretically create a segregated food system throughout distribution to prevent mixing of GE and non-GE-crops.[17] However, because the USDA regulation only requires an "organic" process and not a truly "organic" result, organic growers with contaminated crops will not face USDA regulatory action.[18] As far as the FDA is concerned, GE-foods are not materially different from non-GE-foods.[19] Nevertheless, the FDA does allow certified organic foods to be labeled as GE-free.[20]

B. *Restrictions Abroad*

Many nations impose thresholds for GE-crops, and crops in excess of those limits may be refused.[21] Europe is especially adverse to GE-foods, regardless of the country of origin.[22] In March 1998, the European Union ("EU") suspended approvals for imports of GE-crops.[23] The EU went so far as to freeze approval of GE-corn even though EU scientists determined that the corn was safe.[24] While the EU awaited implementation of a new directive on imports of GE-crops, the ban on approval of new GE-crops continued in 1999.[25] Since the

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14. *See* CENTER FOR FOOD SAFETY AND APPLIED NUTRITION, FDA DOC. 00D-1598, DRAFT GUIDANCE FOR INDUSTRY (citing 65 Fed. Reg. 80,548 (Dec. 21, 2000) (to be codified at 7 C.F.R. pt. 205)), *available at* http://www.cfsan.fda.gov/~dms/biolabgu.html (last visited Oct. 2, 2002).

15. *See id.*

16. *See id.*

17. *See id.*

18. *See* David Safford, *Contamination Presents Organic Farms with Market, Not Regulatory Problems*, 3 Food Safety Rep. (BNA) 520, 520 (May 30, 2001) [hereinafter Safford, *Organic Farms*].

19. Frederick H. Degnan, *The Food Label and the Right-to-Know*, 52 FOOD & DRUG L. J. 49, 49 (1997).

20. *Id.*

21. *See* Safford, *Organic Farms*, *supra* note 18, at 521.

22. *See* Weiss, *supra* note 10, at A1.

23. *See* Sean D. Murphy, *Biotechnology and International Law*, 42 HARV. INT'L L.J. 47, 80 n.137 (2001) (discussing the EU directives concerning approval of imports of GE-crops).

24. *See* Joe Kirwin, *Commission to Halt Approval Process for Bt Maize Seed in Light of New Study*, 22 Int'l Env't Rep. (BNA) 436, 436 (May 26, 1999) (discussing the freeze on approval of Pioneer Hi-Bred GE corn because of a study that Bt pollen may pose a threat to monarch butterflies).

25. *See* Joe Kirwin, *EU Environment Ministers Strengthen De Facto Ban on GMOs; WTO Fight Looms*, 22 Int'l Env't Rep. 567, 568 (May 26, 1999) (discussing the EU's ruling out the

ban on new approvals, the volume of U.S. corn exports has since decreased dramatically.[26] Moreover, the ban on GE-crops in Europe has also affected domestic suppliers of GE-crops.[27]

C. *Private Organic Certification*

No private organization that certifies organic food allows the use of GE-seed.[28] Under the USDA's National Organic Program ("NOP") final rules, foods cannot be certified organic if a grower uses genetically engineered seeds.[29] The NOP final rule "establishes a national-level accreditation program . . . for State officials and private persons who want to be accredited as certifying agents."[30] While the NOP sets the federal requirements, local certification efforts can require a higher standard.[31]

Under the NOP rules, only the use of genetic engineering is prohibited.[32] According to the regulations, "[t]he presence of a detectable residue of a product of excluded methods alone does not necessarily constitute a violation of this regulation."[33] If an organic grower takes reasonable steps to avoid contact with ge-

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new approval of any new GMO applications until new legislation becomes law).

26. *See* Nicole Ballenger et al., *Biotechnology Implications for U.S. Corn and Soybean Trade*, AGRIC. OUTLOOK, Apr. 2000, at 24-25, *available at* http://usda.mannlib.cornell.edu/reports/erssor/economics/ao-bb/2000/ao270.pdf (last visited Nov. 12, 2001) (stating that U.S. corn exports to the EU dropped by more than 90% in 1998).

27. *See ADM, Staley to Reject Some Genetically Modified Corn*, NEWS-GAZETTE (Champaign, Ill.), Apr. 15, 1999, at C8 (reporting that two large U.S. food processors announced that they do not accept "any [GE] corn that is not accepted in the European markets").

28. *See* Hamilton, *supra* note 12, at 104.

29. *See* 7 C.F.R. § 205.105(e) (2001) (discussing certain excluded methods); *see also* 7 C.F.R. § 205.301(f)(1) (2001) (stating that foods labeled as 100% organic cannot be produced using excluded methods); USDA Secretary Dan Glickman, Remarks at the Release of the Final National Organic Standards (Dec. 20, 2000), *available at* http://www.ams.usda.gov/oldnop/glickremarks.htm (stating that "we revised the standards to say that no food could be called organic if…genetic engineering was used in its production"). The Organic Foods Production Act of 1990 required the USDA to develop national standards for organic foods. *See* AGRIC. MKTG. SERV., USDA, NATIONAL ORGANIC PROGRAM: BACKGROUND & HISTORY (Dec. 2000), *at* http://www.ams.usda.gov/nop/ (available under "Consumer Information" link). The USDA intended for the NOP final rules to be similar to private organic standards and applicable to a broad range of agricultural products throughout the United States. *See id.*

30. National Organic Program, 7 C.F.R. § 205.100(b) (2001).

31. *See* 7 U.S.C.A. § 6503(b) (West Supp. 1999).

32. *See* 7 C.F.R. § 205.100(b) (2001).

33. National Organic Program, 65 Fed. Reg. 80,548, 80,556 (Dec. 21, 2000) (to be

netically engineered products, then "the unintentional presence of [genetically engineered] products . . . should not affect the status of an organic product or operation."[34] While the NOP rules discuss the problems faced by pollen drift, such concerns are "outside the scope of [the NOP] regulation by definition."[35] Because the NOP rules only regulate organic certification, the NOP has no power to regulate non-organic operations.[36] Under the framework of the NOP rules, an organic grower who takes "reasonable steps" to avoid GE-contamination and has a detectable amount of GE-contamination could still have a certified organic product.[37] No liability will result from GE contamination if the organization offering certification allows less than one hundred percent non-GE crops to be certified as organic. As discussed previously, no private organization will certify a crop as organic if any amount of GE-contamination is detected.[38]

D. *Damages Due to GE-Crop Contamination*

Organically grown food can command a higher price than non-organic foods. Contamination by GE-crops may lead to a loss in crop value.[39] There are numerous examples of growers who have lost money due to GE-crop contamination.[40] Because StarLink corn, sold by Aventis, is not approved for human consumption,[41] it has proven to be the most costly contaminate to date.[42] Even if a

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codified at 7 C.F.R. pt. 205).

34. *Id*.

35. *Id*.

36. *See id*.

37. *Id*.

38. *See generally* Hamilton, *supra* note 12, at 104 (indicating that no organization allows the use of GE seeds and there are a variety of alternative sources for genetic contamination).

39. *See* Lilliston, *supra* note 13, at 26 (stating that GE contaminated corn can drop in price from $4.00 a bushel to $1.67).

40. *See generally* Anthony Shadid, *Blown Profits: Genetic Drift Affects More than Biology – US Farmers Stand to Lose Millions*, BOSTON GLOBE, Apr. 8, 2001, at G1 (giving the examples of an organic grower who lost eight hundred bushels from cross-pollination with Bt corn and an organic tortilla chip producer whose entire shipment of eighty-seven thousand bags was refused in Europe due to traces of GE-corn).

41. *See Bayer Rejects Liability for Starlink*, CHEMICAL WK., July 25, 2001, at 8 (stating that
StarLink corn is not approved for human consumption in Europe, Japan, or the United States).

42. *See id*. Fortunately, Aventis has formed agreements with many states to pay millions in compensation to growers and grain elevator operators for the loss in value of contaminated crops. Mike Glover, *Maker of Gene-Altered Feed Corn to Pay Millions; Compensation Stated to*

grower avoids contamination, the costs of prevention include planting buffer zones, cleaning equipment, inspections, and testing.[43]

III. METHODS OF CONTAMINATION

Because our food system is not designed to segregate foods based on GE status,[44] co-mingling of GE and non-GE-foods is likely to occur. According to Susan Harlander, president of a biotech consultant group, consumers cannot avoid at least a low level of GE-food products in their food.[45] In fact, seed sold today is more likely than not to have some GE-crop contamination.[46] As the continuing StarLink episode demonstrates, such co-mingling has severe consequences. Different concerns are raised depending on how the co-mingling occurs. Robert Frost's famous quote, "good fences make good neighbours,"[47] does not readily apply to organic growers. With all of the ways in which a crop might become contaminated with GE-crop material, no "fence" may be adequate.

A. *Pollen Drift*[48]

For open pollinating crops, the seed that a farmer buys to grow his crops only represents half of what the farmer needs to harvest a crop.[49] Just like any sexually reproducing organism, pollinated crops have two parents. For growers of non-GE-crops, pollination creates the risk of a GE-parent pollinating a non-GE-plant. The resulting "embryo," (*i.e.*, seed) carries the genetic material of

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Offset Losses from Contamination Scare, CHI. TRIB., Jan. 24, 2001, at A6.

43. *See generally* Lilliston, *supra* note 13, at 26.

44. *See NewsHour with Jim Lehrer: Genetic Recall* (PBS television broadcast, Nov. 23, 2000), *available at* http://www.pbs.org/newshour/bb/science/july-dec00/corn_11-23.html.

45. *See* David Safford, *Keeping Modified, Conventional Crops Separate Not Realistic, Consultant Says*, 3 Food Safety Rep. (BNA) 519, 519 (May 30, 2001).

46. *See GM Seed Fears Grow*, BBC News Online, May 26, 2000, *at* http://news.bbc.co.uk/1/hi/sci/tech/764742.stm (reporting that Pioneer Hi-Bred admitted that seed was contaminated).

47. ROBERT FROST, *Mending Wall*, *in* COLLECTED POEMS OF ROBERT FROST 47 (Edward Conway Latham ed., Henry Holt & Co. 1936).

48. Many authors refer to pollen drift of genetically modified pollen as "genetic drift." The term "genetic drift" already has meaning in terms of population genetics. To prevent confusion, the term "pollen drift" is used in this note to describe the drift of pollen from GE-crops. "Gene flow" is also a proper term for describing the movement of genes from one plant to another.

49. *See* Debra L. Blair, Note, *Intellectual Property Protection and Its Impact on the U.S. Seed Industry*, 4 DRAKE J. AGRIC. L. 297, 311 (1999).

both parents, including non-natural genetic alterations. The majority of the pollination will come from the plant itself or the plant's neighbor, but some pollination can occur from adjacent fields.[50]

Most pollen falls within yards of the source plant, but pollen is still viable after traveling one fourth of a mile or further.[51] While some studies reported that as the distance from the source increases, the amount of cross pollination decreases exponentially,[52] researchers recently observed that the frequency of cross-pollination did not significantly decrease over distance.[53] Wind and insects can even carry pollen several miles.[54] The percentage of plants that are cross-pollinated has been reported to be less than one percent.[55] This is good news for traditional farmers as the data "suggests that the levels of gene diffusion are below European standards for contamination of conventional food."[56] While the amount of cross-pollination may be infinitesimal, any detection of a GE-crop may cause an organic grower to lose certification.[57]

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50. *Cf.* C. Lavigne et al., *A Pollen-Dispersal Experiment with Transgenic Oilseed Rape*, 96 THEORY OF APPLIED GENETICS 886, 887 (1998) (noting that air-borne or pollinator-borne pollen was historically, and still is, thought to pollinate nearby plants, but more recent studies have shown pollen to travel up to 100 meters).

51. *See* R. L. NIELSEN & DIRK E. MAIER, GRAIN QUALITY FACT SHEET NO. 46: GMO ISSUES FACING INDIANA FARMERS IN 2001, at 2 (Apr. 4, 2001), *available at* http://www.agcom.purdue.edu/AgCom/Pubs/GQ/GQ-46.pdf; *see also* Mary A. Rieger et al., *Pollen-Mediated Movement of Herbicide Resistance Between Commercial Canola Fields*, 296 SCI. 2386, 2387 (2002) (stating that in a test of commercial fields, GE-traits were not detected more than three kilometers—one and one-half miles—from the source).

52. *See* Lavigne et al., *supra* note 50, at 895.

53. *See* Rieger et al., *supra* note 51, at 2387. Unlike previous studies, this study was conducted in real commercial canola fields. *Id*. at 2386. Over 48 million individual plants were tested. *Id*.

54. *See* Lilliston, *supra* note 13, at 26; *see also* Shadid, *supra* note 40, at G1.

55. *See, e.g.*, Rieger et al., *supra* note 51, at 2387 (reporting that the highest frequency of intake of GE-traits was 0.07% and that GE-traits could not be detected in many of the target fields).

56. Erik Stokstad, *A Little Pollen Goes a Long Way*, 296 SCI. 2314, 2314 (2002).

57. 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, 484 (2000); *see also* Stokstad, *supra* note 56, at 2314 (quoting Paul Raymer, an agronomist at the University of Georgia, Griffin, who stated that "[i]t's going to be difficult . . . to produce a truly [GE]-free crop," and "[z]ero tolerance is not going to work"); John P. Mandler & Kristin R. Eads, *Potential Liability Exposure to Seed Companies from GMO Pollen Drift*, AGRA/INDUS. BIOTECH. LEGAL LETTER, May 2000, at 1-2 (asserting that GE-crop contamination would render organic crops unmarketable).

To reduce the instance of cross-pollination with neighboring fields and wild species, seed companies are required to set out buffer zones.[58] Current federal regulations usually require a 660 foot buffer zone, which is inadequate when pollen travels longer distances.[59] Seed companies may instruct growers to use buffer zones through grower agreements.[60] The EPA mandated the seed company, Aventis, to establish 660 foot buffer zones around fields planted with StarLink corn.[61] Aventis did not enforce the buffer zones, monitor their effectiveness, or test for contamination.[62] Regardless of enforcement of the buffer zones, StarLink pollen has reportedly escaped the buffer zones by three-fourths of a mile.[63]

While buffer zones may be inadequate in preventing traits from passing from one field to another, the same technology that produced genetically engineered plants may be used to prevent the escape of GE traits.[64] Such methods of preventing gene escape include the controversial seed sterility technology, also known as the Terminator Gene, and the simple use of incompatible genomes among commercial varieties.[65] Containing GE-traits in their fields would reduce the concerns of organic growers who fear the onslaught of GE-pollen producing GE-seed on what used to be a non-GE-crop. However, even using a "fence" derived from molecular biology, growers must still contend with the danger of mixing once the crop is off the field.

B. *Contaminated Seed*

No amount of vigilance on the part of a grower will prevent contamination with GE-crops if the seed the grower buys is already contaminated. Much of

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58. Shadid, *supra* note 40, at G1.

59. *Id.*

60. Kurt Eichenwald, *New Concerns Rise on Keeping Track of Modified Corn*, N.Y. TIMES, Oct. 14, 2000, at A12.

61. GABRIELA FLORA, INST. FOR AGRIC. AND TRADE POLICY, AVENTIS: GLOBAL COMPACT VIOLATOR (2001), *available at* http://www.corpwatch.org (available under "Biotechnology" link) (last visited Oct. 22, 2002).

62. *Id.*

63. *See* Shadid, *supra* note 40, at G1.

64. *See* Henry Daniell, *Molecular Strategies for Gene Containment in Transgenic Crops*, 20 NATURE BIOTECHNOLOGY 581, 581 (2002) (stating that "[w]ith the availability of current molecular technologies, the opportunity exists to alter gene flow by interfering with flower pollination, fertilization, and/or fruit development").

65. *See generally id*. (discussing many molecular techniques that could be used to prevent gene transfer).

the commercially available seed in the United States has trace levels of GE-crops.[66] Most seed producers are reluctant to certify seed that is one hundred percent non-GE-crop.[67] One problem is a lack of accurate testing. In the case of Bt crops, seed companies cannot guarantee zero presence of transgenes because the current test only detects the transgenes at a "minimum detectable level of no less than 0.2% with a 99% probability."[68]

C. *Other Sources of Contamination*

Many on-farm and off-farm practices can lead to crop contamination. "Volunteers" may germinate from the soil of fields where GE-crops have been grown.[69] Purdue University's Grain Quality Task Force recommends that "any field planted to a transgene [corn] hybrid in 2000…should not be planted to corn in 2001" to insure a non-GE-crop.[70] Weedy plants such as canola can be found around fields, on the roadside, and anywhere else nobody cuts the grass. Even if a field is given sufficient time to discourage growth from buried GE-seed, a grower may still find GE-plants growing amongst the most traditional of crops.[71] Contamination can also result from sharing equipment such as combines, elevators, or trucks.[72] A Purdue University corn specialist recommends cleaning equipment after its use with GE-crops and planting or harvesting non-GE-crops before GE-crops.[73] However, no amount of precaution on the farm can protect from co-mingling of seed at the grain elevator or during shipment.[74]

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66. *See* Shadid, *supra* note 40, at G1.
67. *See* Nielsen & Maier, *supra* note 51, at 1-2, *available at* http://www.agcom.purdue.edu/AgCom/Pubs/GQ/GQ-46.pdf.
68. *See id.*
69. *See id.*
70. *See id.*
71. *See id.*
72. *See* Lilliston, *supra* note 13, at 27.
73. *See Technology for Crops*, SUCCESSFUL FARMING, Oct. 1, 2001, at 54.
74. *See id.* (suggesting farmers avoid co-mingling by moving GE-crops off farm).

IV. SOURCES OF LIABILITY[75]

A. *Current Case Law*

1. *Foreign Cases*

In the United States, there is little case law relating to GE-crop contamination of non-GE-crops,[76] but some litigation concerning GE-crops has been resolved outside of the United States.[77] In Canada, Monsanto sued a canola farmer, Percy Schmeiser, for using its Roundup Ready Canola.[78] The farmer defended with the counterclaim that pollen from Monsanto's canola had drifted onto his fields and pollinated his crop.[79] To the chagrin of organic growers, the Canadian courts held that while some of Monsanto's product may have pollinated with the farmer's canola, the concentration of Roundup Ready Canola in his field could not have been caused by drift.[80] Regardless of how Roundup Ready Canola came to be on Schmeiser's farm, the court determined that Schmeiser knew or should have known that his canola was Roundup resistant.[81]

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75. Various secondary authorities have analyzed theories of liability that a court may use when an actual case involving GE contamination comes before the court. *See generally* Richard A. Repp, *Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift*, 36 IDAHO L. REV. 585 (2000); Charles A. Deacon & Emilie K. Paterson, *Emerging Trends in Biotechnology Litigation*, 20 REV. LITIG. 589 (2001) (discussing various theories of liability that could spring from genetically engineered crops); Mandler & Eads, *supra* note 57 (discussing various theories of liability that could arise from contamination by pollen from genetically engineered crops). Despite the voluminous discussion concerning liability springing from the growth of GE crops, researchers are still perfecting GE-crops, seed companies are still introducing new varieties, the regulatory framework is still evolving, and the case law on the subject is in its infancy. The purpose of this note is to provide an update on the issue and offer the countervailing view that perhaps there is little liability for growing GE-crops.

76. *See* Lilliston, *supra* note 13, at 29; NEIL HARL, IOWA GRAIN QUALITY INITIATIVE, FREQUENTLY ASKED QUESTIONS REGARDING THE PRODUCTION OF TRANSGENIC CROPS, AGDM SPECIAL FEATURE (Apr. 2000), *available at* http://www.exnet.iastate.edu/agdm/articles/harl/HarlApr00.htm (stating that there has not been a GE-corn pollen drift case). Cases relating to contamination by Starlink corn are still pending trial, but a summary judgment handed down so far is discussed elsewhere in this note. *See generally In re* Starlink Corn Prod. Liab. Litig., 212 F. Supp. 2d 828 (N.D. Ill. 2002).

77. *See generally Ex parte* Watson, 1999 Envtl. L. Rep. 310 (Eng. C.A. 1998).

78. Monsanto Canada Inc. v. Schmeiser, 2001 F.C. 256, ¶ 1, *available at* http://decisions.fct-cf.gc.ca/fct/2001/2001fct256.html.

79. *See id*. ¶ 117.

80. *Id*. ¶ 118.

81. *Id*. ¶ 120.

In a United Kingdom case, an organic farmer fearing the cross-pollination between his crop and a trial planting of GE-corn, sought an order for the destruction of the trial plants before the GE-pollen could spread.[82] Because the United Kingdom's Soil Association has a zero tolerance policy for GE-crops, the court held that cross pollination and loss of organic status would "have a devastating effect upon the applicant's business, reputation and livelihood."[83] The application was dismissed because of a United Kingdom law that allowed the GE-crop planting.[84] Nevertheless, if the case were not statutorily barred, the action would be one of nuisance, and the major issue in such an action would be to what extent an organic grower could limit crop growth in a farming area by introducing specially sensitive crops.[85]

2. *Starlink*

The only litigation in the United States concerning GE-crops involves Starlink corn.[86] Fifteen separately filed cases by plaintiffs from all over the country were consolidated by the Panel for Multidistrict Litigation and heard in the Northern District of Illinois by Judge Moran.[87] Leaving no theory of liability unmentioned, the plaintiffs brought fifty-seven counts against the seed manufacturer, Aventis Cropscience, and the distributor, Garst Seed Company.[88] As of the time this note was published, the court had ruled upon a motion for summary judgment brought by the defendants.[89] Among the common law claims, plaintiffs also brought various state law claims based on deceptive trade practices.[90] Because these statutory claims are not germane to the topic of GE-contamination, they are not discussed here.

The defendants argued that the Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA")[91] preempted the plaintiff's state law claims.[92] FIFRA regulates pesticide use[93] and prohibits states from imposing labeling requirements

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82. *See Watson*, 1999 Envtl. L. Rep. 310.
83. *Id*.
84. *See id*.
85. *See id*.
86. *In re* StarLink Corn Prod. Liab. Litig., 212 F. Supp. 2d 829, 833 (N.D. Ill. 2002).
87. *See id*.
88. *See id*.
89. *Id*. at 834.
90. *Id*. at 848, 851.
91. *See* 7 U.S.C. § 136 (2000).
92. *StarLink*, 212 F. Supp. 2d at 833.
93. 7 U.S.C. § 136a(a) (2000).

beyond EPA requirements.[94] Judge Moran determined that "FIFRA . . . preempts any claims based on the inadequacy of Starlink's label or defendant's failure to warn Starlink farmers."[95] However, FIFRA does not preempt claims based on the standard of care mandated by the EPA, such as negligence per se claims.[96]

Judge Moran held that the plaintiffs could not sue over the cross pollination or the commingling of StarLink corn with other varieties because such claims allege a defect in the EPA-approved label.[97]

Judge Moran also ruled against the plaintiffs' conversion claim.[98] The court determined that the only damage to the plaintiffs' corn was a decrease in its price, which could support an action in trespass, but not conversion.[99] Moreover, conversion requires intent, and the most that plaintiffs could hope to prove is negligence on the part of Aventis and Garst.[100]

The actions of private and public nuisance, based on the cross-pollination, were sustained.[101] Because of the limited registration, the defendants were in a position to control the nuisance, and substantially contributed to the nuisance.[102] Only the nuisance claims based on a defect in the label were preempted by FIFRA.[103] The public nuisance claims were sustainable as alleging an interference with a public right.[104] StarLink contaminated the food supply, which implicates the health and safety of the general public.[105] A public nuisance action must also demonstrate a type of harm to the general public different than the private nuisance action.[106] In the case of StarLink contamination, because the farmer plaintiffs depended on the crops for their livelihood, they were harmed in a manner different from the general public.[107]

Several factors distinguish the StarLink line of cases from future cases. First, the EPA granted Aventis a limited registration for StarLink, which required

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94. *Id.* § 136v(b).
95. *StarLink*, 212 F. Supp. 2d at 836.
96. *Id*.
97. *Id*. at 837-38.
98. *Id*. at 844
99. *Id*.
100. *Id*.
101. *Id*. at 847-48.
102. *Id*. at 847.
103. *See generally id*. (discussing the exclusion of nuisance claims based on other types of defects).
104. *Id*. at 848.
105. *See id*.
106. *See id*. (relying on RESTATEMENT OF TORTS § 821C).
107. *Id*. (drawing an analogy to a case brought by commercial fisherman over an oil spill in fishing waters).

special procedures for handling StarLink corn.[108] Judge Moran determined that the limited registration imposed an affirmative duty upon Aventis to enforce the EPA requirements.[109] It is this duty that makes a nuisance claim against Aventis possible,[110] and less likely against seed companies or growers not bound by a limited registration. Secondly, despite failing to approve StarLink for human consumption, Aventis allegedly advised farmers that the EPA would permit StarLink for human consumption.[111] Corn contaminated with StarLink cannot be sold for human consumption, and commands a lower price. It is because of these lower prices that the plaintiffs have filed lawsuits.[112] Again, because Aventis had a duty to enforce the EPA requirements, Aventis also had a duty to prevent StarLink from entering the human food supply.[113] Since *StarLink*, all GE-crops on the market, with the exception of cotton, have been approved for human consumption.[114]

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108. *See id*. at 834 (listing EPA-mandated procedures for handling StarLink corn as mandatory segregation, a buffer zone between fields, and a requirement that Aventis enforce the restrictions).

109. *See id*. at 847.

110. *See id*. (holding that the plaintiffs in the StarLink cases did state a valid claim for private nuisance).

111. *Id*. at 835.

112. *See id*. at 833.

113. *See id*. at 843.

114. *Agriculture, Rural Development, Food and Drug Administration, and Related Agencies Appropriations for 2002: Hearing Before a Subcomm. of the House Comm. on Appropriations*, 107th Cong. 27-28 (2001).

B. *Theoretical Causes of Action*[115]

1. *Trespass*

Under the liability theory of trespass, a grower could theoretically sue a neighbor for invasion of property.[116] Could a farmer be liable for trespass due to pollen? So far, no farmer has been held liable.[117] Yet, GE-pollen is fairly new, and unlike all pollen that has existed before it, GE-pollen has the potential to wreak havoc on an organic grower's business.

Trespass claims are not a likely source of liability. If courts allow non-GE-crop growers to file trespass actions against their neighbors for the spread of GE-pollen, the industry of GE-crops would be obliterated. Because GE-pollen can drift for miles,[118] few farms would be isolated enough to avoid liability. The public policy in favor of free farming would likely weigh against liability based on trespass.

Particulate matter has been held to be sufficient for an action of trespass.[119] For particles to constitute trespass, the particles must accumulate and not blow or wash away.[120] Precedent has held that an element for trespass in terms of industrial particulate matter is a showing of "actual and substantial damages."[121] The rationale for the added element was that "no useful purpose would be served

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115. Two theories of liability not mentioned independently are strict liability and negligence. While plaintiffs may want to sue based on a theory of strict liability, pollen drift does not appear to be an issue of strict liability. Unlike inherently dangerous activities such as blasting, pollen is actually quite safe. Negligence is similar to strict liability with a higher burden of proof. Negligence also requires a duty of care. Courts might have difficulty applying a duty of care just because a plaintiff is a defendant's neighbor. *See* VICTORIA E. SCHWARTZ ET AL., PROSSER, WADE AND SCHWARTZ'S TORTS: CASES AND MATERIALS 811 (Robert C. Clark et al. eds., 10th ed. 2000) (discussing duty of care in nuisance actions). A duty does exist when a buyer contracts with a seller, and in that sense, strict liability and negligence are discussed in terms of lawsuits against seed companies in the StarLink section. This note also discusses that duty in terms of breach of warranty.

116. Under the theory of trespass, a landowner has the legal right to exclusive possession of land. *See* RESTATEMENT (SECOND) OF TORTS § 165.

117. After an exhaustive search of case law, this author has found no case of suit against a
landowner over an invasion by pollen.

118. *StarLink*, 212 F. Supp. 2d at 834.

119. *See e.g.*, Bradley v. Am. Smelting & Ref. Co., 709 P.2d 782, 792 (Wash. 1985) (stating that even invasion of unseen molecules can be trespass).

120. *Id.* at 791.

121. *Id.* at 792; *see also* Borland v. Sanders Lead Co., 369 So. 2d 523, 529 (Ala. 1979) (discussing nuisance action based on deposition of particulate matter).

by sanctioning actions in trespass by every landowner within a hundred miles of a manufacturing plant."[122] The court determined that the costs to society from litigation outweighed the benefit to a few landowners.[123]

As compared to particles emanating for hundreds of miles from a factory, GE-pollen travels much shorter distances and has the potential to cause much greater harm.[124] In suits for trespass due to pollen drift, a farmer likely faces action only by immediate neighbors.[125] Organic growers who lose accreditation must sell their crops for a lower price.[126] Such harm could be held actual and substantial. Yet, unlike a manufacturing plant, an offending farmer also has less money to pay claims. The costs to society in terms of increased food costs may still be too high when compared to the damages from the trespass. At the most, an action for trespass would be a close call.

2. *Nuisance*

Possible contamination by pollen drift may be characterized as a nuisance action.[127] Unlike trespass, a private nuisance action does not require a physical invasion, but may accompany a trespass.[128] Also unlike trespass, a plaintiff in a nuisance action must show damages resulting from the defendant's conduct.[129]

In the case of nuisance created by farming operations, all states have some form of a Right to Farm statute.[130] The typical Right to Farm statute prevents new neighbors from bringing nuisance actions against established agricultural practices.[131] The purpose of the legislation was to prevent destruction of farmland by plaintiffs who knowingly move to agriculturally reserved land.[132]

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122. *Bradley*, 709 P.2d at 791.
123. *See id*.
124. *See* Hamilton, *supra* note 12, at 104.
125. *Cf. id*. at 105 (discussing legal arguments available to both damaged growers of non-GE-crops and growers of GE-crops).
126. *See, e.g.*, Lilliston, *supra* note 13, at 26.
127. *See Bradley*, 709 P.2d at 791; Hamilton, *supra* note 12, at 104.
128. *See* SCHWARTZ ET AL., *supra* note 115, at 803.
129. *See id*. at 803.
130. *See* Alexander A. Reinert, *The Right to Farm: Hog-Tied and Nuisance-Bound*, 73 N.Y.U. L. REV. 1694, 1706 n.76 (1998).
131. *See* Leaf River Forest Prod., Inc. v. Ferguson, 662 So. 2d 648, 661 (Miss. 1995) (arguing that discharge into local rivers was the cause of personal injury and property damage).
132. *See* Spur Indus., Inc., v. Del E. Webb Dev. Co., 494 P.2d 700, 706-707 (Ariz. 1972).

In the case of nuisance caused by GE-pollen, a Right to Farm statute might not apply. Regardless of who was growing GE-crops or organic crops first, both parties would be farmers. Furthermore, allowing adjudication of nuisance actions between farmers would not belie legislative intent to prevent urban encroachment. In deciding whether to invoke a Right to Farm statute, courts need to balance the interests of both parties in a nuisance action.[133]

3. *Analogy to Spray Drift*

Many courts have held insecticide and herbicide sprayers liable for damages to neighboring crops.[134] Similar to pollen drift, in spray drift cases, the offending spray is wind-blown into a neighboring field. The most analogous case of spray drift is *Langan v. Valicopters, Inc.*[135] In Langan, an organic food association in Washington sold organically grown food with the group's seal.[136] Similar to the non-GE requirement to certify organic crops, the Washington organic food association would not certify crops with a certain amount of insecticides.[137] The defendants inadvertently sprayed insecticide over the organic crops,[138] the organic crops were decertified, and the plaintiff pulled the crops.[139] The court held that the decertification was damage and a result of the crop spraying.[140] While many jurisdictions apply a negligence theory in spray drift cases, the Supreme Court of Washington chose to apply a strict liability standard for the plainly hazardous use of pesticides.[141] In assigning strict liability as the cause of action for spray drift, the court balanced the social good of pest reduction with the need to compensate organic growers for damage to their crops.[142]

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133. *See* RESTATEMENT (SECOND) OF TORTS § 826(b) (1979) (stating that a nuisance should be sustained even if the harm to the utility of the nuisance conduct is outweighed by the "serious" harm and that damages are not so great as to put the defendant out of business); *see, e.g.*, Carptenter v. Double R. Cattle Co., 701 P.2d 222, 227 (Idaho 1985)
(stating that the "interests of the community, which would include the utility of the conduct, should be considered in the determination of existence of a nuisance").

134. *See, e.g.*, Langan v. Valicopters, Inc., 567 P.2d 218, 220 (Wash. 1977); Binder v. D.R. Perkins, 516 P.2d 1012, 1016 (Kan. 1973).

135. 567 P.2d 218, 234 (Wash. 1977) (holding aerial sprayer liable for chemical damage to neighbor's crops).

136. *Id.* at 219.

137. *Id.*

138. *Id.*

139. *Id.* at 220.

140. *Id.*

141. *Id.* at 220-23.

142. *Id.* at 223.

Spray drift is only tenuously analogous to pollen drift. Unlike chemical sprays, pollen is not inherently dangerous, and thus a strict liability standard is inappropriate for pollen drift.[143] Conversely, organic certification in *Langan* did not depend upon a zero tolerance of pesticides and herbicides, but organic certification often requires a one hundred percent non-GE-crop.[144] In striking a balance between the social good of GE-crops and the need to pay damages to organic growers, a court will likely note the passive nature of pollen drift versus the active spread of hazardous chemicals in spray drift cases. Even a negligence standard may be too large of a burden on growers of GE-crops, as GE-crops are grown the same way as non-GE-crops.

4. *Implied Warranty of Fitness*

An implied warranty of fitness is imposed when a seller knows the purpose for which the crop is to be used and the buyer relies on the seller to provide suitable goods.[145] While at least one set of authors believes seed sellers will not offer implied warranties based on the "unpredictability of biotech products,"[146] growers who must eventually sell one hundred percent non-GE-crops will likely only buy seed from sellers who assure seed that is one hundred percent non-GE-seed. Therefore, despite the "unpredictability of biotech products,"[147] seed suppliers who make claims as to the purity of their seeds may face actions based on breach of implied warranty of fitness.

Unlike nuisance and trespass, where a stranger sues a stranger, an implied action for breach of warranty is between the buyer and the seller.[148] An implied warranty of fitness is imposed when a seller knows the purpose for which the crop is to be used and the buyer relies on the seller to provide suitable goods.[149] In a case involving poor onion seeds, the Tenth Circuit discussed breach of warranty.[150] The plaintiff had purchased onion seeds from Asgrow, and

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143. Endres, *supra* note 57, at 490 (*citing* Gotreaux v. Gary, 94 So. 2d 293, 294-95 (La. 1957)).

144. *Id.* at 484.

145. *See* HARL, *supra* note 76, *available at* http://www.exnet.iastate.edu/agdm/articles/harl/HarlApr00.htm.

146. *See* Deacon & Paterson, *supra* note 75, at 607.

147. *See id.*

148. *See* SCHWARTZ ET AL., *supra* note 115, at 803.

149. *See* HARL, *supra* note 76, *available at* http://www.exnet.iastate.edu/agdm/articles/harl/HarlApr00.htm.

150. *See* Lutz Farms v. Asgrow Seed Co., 948 F.2d 638, 643-45 (10th Cir. 1991).

the seeds produced double onions.[151] A disclaimer in the contract failed to negate the implied warranty of merchantability under the applicable state law.[152] The court noted that the wording and text size of the disclaimer was important to upholding the verdict against Asgrow.[153] Such a holding is important because seed suppliers might bury disclaimers that they are supplying less than one hundred percent GE-seed. In terms of an express warranty, the law of the Tenth Circuit does not require reliance from the buyer when "the seller's statements were of a kind which naturally would induce the buyer to purchase the goods and that [the buyer] did purchase the goods."[154] While it is the job of sellers to induce buyers to purchase goods, seed suppliers might be more reluctant to offer affirmative guarantees of seed identity if there is a danger of suit.

C. *Federal Pre-emption*

The USDA, EPA, and FDA have stated that liability for damage from GE-crops is not a federal issue, but instead is an issue that should be decided by state courts.[155] While laws concerning liability of GE-crops do not currently exist, some recent bills in Congress would assign liability to seed companies for damages from GE-crops.[156] Several states also have bills pending in their legislatures which would impose liability for GE-crop contamination.[157]

Organic farmers have no federal cause of action to sue over growth of GE-crops.[158] The FDA does not differentiate between GE-crops and non-GE-crops.[159] Furthermore, under the NOP's final rules, organic growers can be theoretically certified despite GE-contamination.[160] The NOP final rules state that the NOP has no position as to liability from GE-contamination.[161]

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151. *See id*. at 639.
152. *Id*. at 644.
153. *Id*. at 646.
154. *Id*. at 645 (citing Norton v. Lindsey, 350 F.2d 46, 49 (10th Cir. 1965)).
155. *See* Shadid, *supra* note 40, at G1.
156. H.R. 4816, 107th Cong. (2002) (holding biotech companies liable for injuries caused by the release of GE-crops); s*ee also* Lilliston, *supra* note 13, at 26.
157. *See, e.g.*, H.F. 2614, 81st Reg. Sess. (Minn. 2000); L.B. 959, 96th Leg., 2d Reg. Sess. (Neb. 2000).
158. *See In re* StarLink Corn Prod. Liab. Litig., 212 F. Supp. 2d 829, 835-36 (N.D. Ill. 2002).
159. *See* Degnan, *supra* note 19, at 49.
160. *See* National Organic Program, 7 C.F.R. pt. 205 subpt. B (2001).
161. *See generally id.* pt. 205.

The question for the courts then becomes whether federal law pre-empts a state cause of action. If federal preemption is express, then congressional intent to preempt state law must be clearly stated in the federal statutes.[162] Federal preemption may also be implied when state law would inhibit the furtherance of Congress's objectives or regulate conduct in a field that Congress meant to have exclusive regulatory power.[163]

Since crops are regulated by the FDA, EPA, and USDA, a court would face a difficult task in determining which federal statutes would apply to cases of GE-contamination.[164] All three agencies have stated that liability is a state, not a federal question.[165] Yet, the FDA has stated that GE-food is not materially different from non-GE-foods.[166] The EPA has set the requirements for how GE-crops can be grown.[167] The USDA has even set forth the requirements for certification of crops as organic, which includes non-GE-crops.[168] A court decision that holds growers of GE-crops liable for pollen drift would inexorably alter the federal framework of GE-crop regulations. State courts should at least consider the Federal Government's approval of GE-crops in determining whether a farmer can be held liable for merely growing GE-crops.[169]

D. *Analogy to Nuisance of Plant Diseases*

While pollen drift may be analogous to spray drift, pollen drift might also be analogous to the spread of plant diseases. Plant disease can spread to neighboring fields and damage crops.[170] Federal and state agencies regulate the

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162. Ryan v. Brunswick Corp., 557 N.W.2d 541, 546 (Mich. 1997) (citing Cipollone v. Liggett Group, Inc., 505 U.S. 504, 516 (1992)).

163. *See id.*

164. For example, several statutes give the agencies power to regulate GE-crops with plant incorporated pesticides. The Federal Insecticide, Fungicide, and Rodenticide Act ("FIFRA") gives the EPA authority to regulate any plants with pesticide properties. *See* 7 U.S.C. § 136 (2000).

165. Shadid, *supra* note 40, at G1; *see also* Endres, *supra* note 57, at 481-82 (stating that not even the regulatory agencies can use federal laws to sue over damages caused by GE crops).

166. Degnan, *supra* note 19, at 49 (citing FDA, TALK PAPER T96-68, EVALUATION OF BIOENGINEERED SOYBEAN AND CORN VARIETIES 3 (Oct. 7, 1996)).

167. *See* Shadid, *supra* note 40, at G1.

168. *See* National Organic Program, 7 C.F.R. §§ 205.200-.207 (2001).

169. Many argue that the federal regulations promote the use of GE-foods as a safer alternative to non-GE-foods. *See generally* Drew L. Kershen, Essay, *The Risks of Going Non-GMO*, 53 OKLA. L. REV. 631 (2000) (arguing that producing all non-GE-foods risks product liability, environmental compliance, and scientific ignorance).

170. *See* Dep't of Agric. & Consumer Servs. v. Polk, 568 So. 2d 35, 37 (Fla. 1990).

spread of plant disease.[171] A grower may be charged with nuisance for letting fields become rife with plant bacteria, fungus, and viruses. Such growers do not face lawsuits by their neighbors, but may face destruction of their diseased crops by state agencies.[172] In Florida, if the plant disease constitutes a nuisance, the infected plants may be destroyed without compensation to the grower.[173] Use of GE-crops that are resistant to plant pests and disease should limit a farmer's exposure to such nuisance actions. On the other hand, many organic growers use the actual bacteria that produce Bt toxins to reduce plant pests.[174] Enforcement of nuisance laws by state actors to destroy plant diseases does not require the Government to compensate the owners of the destroyed plants.[175] If plant pests become resistant to Bt, an organic grower may attempt to enforce nuisance statutes to destroy a neighbor's Bt crop in order to destroy Bt resistant pests.

E. *Proof*

When a grower does find GE-crop contamination, how do they find the culprit? Whatever theory of liability a court utilizes, a plaintiff suing over contamination will need some proof as to where the contamination originated, and how the crops became contaminated. Growers have some tools to test for the genetic identity of the GE-contaminant.[176] Once a grower knows the identity of

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171. *See* NAT'L PLANT BRD., USDA, SAFEGUARDING AMERICAN PLANT RESOURCES: A STAKEHOLDER REVIEW OF APHIS-PPQ SAFEGUARDING SYSTEM 7-8, *available at* http://www.aphis.usda.gov/ppq/safeguarding/ (last visited Sept. 18, 2002) (providing a broad overview of federal agency regulation of plant diseases); *see, e.g.*, Brian P. Baker, *Pest Control in the Public Interest: Crop Protection in California*, 8 UCLA J. ENVTL. L. & POL'Y 31, 35-40 (1988) (providing an overview of California's plant pest and disease control scheme).

172. *See, e.g.*, Miller v. Schoene, 276 U.S. 272, 277 (1928) (affirming judgment of order directing tree owner to cut down diseased trees).

173. *See Dep't of Agric. & Consumer Serv.*, 568 So. 2d at 43; FLA. STAT. ANN. § 581.031(17) (West 2001 & Supp. 2002).

174. Since the bacteria exists in nature and naturally produces the pesticide, the methods are still "organic" and do not affect organic certification.

175. *See Miller*, 276 U.S. at 272.

176. Two methods to test genetic identity are Enzyme Linked Immunosorbant Assay ("ELISA") and Polymerase Chain Reaction ("PCR"). PIONEER HI-BRED, INC., TESTING FOR GENETICALLY ENHANCED TRAITS, *at* http://www.pioneer.com/biotech/product_safety/biotech_issues.htm (last visited Oct 30, 2002). An ELISA test detects GE-proteins from plant materials, and costs $5-$10 a test. ELISA tests cannot identify the DNA "fingerprint" of a plant, but can be used to identify GE-proteins from such varieties as BT and StarLink. PCR is more precise than ELISA, as PCR can be used to identify the DNA "fingerprint" of a plant. PCR is expensive, costing as much as $250 a test, and must be conducted in a laboratory. When used with other methods of molecular biology, PCR can specifically

the GE-contaminant, the grower needs to find the source. A prudent grower might make note of the wind patterns, and the dates when a neighbor's field begins pollinating.

F. *Settlement*

Courts will never agree on a theory of liability if cases involving GE-contamination never go to trial. Both sides have reasons to avoid adjudicating the issue. Without a clear prediction of how a court will resolve the issue, the first cases of contamination from pollen drift are a risk.

Lawyers paid on contingency should naturally be reluctant in taking on expensive litigation with no clear case law to support a speculation of victory.[177] A trial involving contamination due to pollen drift will ultimately require expert testimony. Determining the extent of contamination would require testimony concerning the accuracy of genetic testing and the flow of pollen.[178] Determining the damages to the organic farmer would require calculating the damage to the organic farmer's reputation, loss of organic certification, and possibility of mitigation damages by selling crops without organic certification.[179] For smaller farms, the costs of litigation might outweigh the possible benefits of a favorable verdict. Suits against small farmers are equally troubling, as many small farmers have little equity to pay a judgment. Naturally, much of the litigation over the StarLink debacle has involved class action suits against the solvent seed company.[180]

More important to both sides of the issue is the danger of resolving the rule of law on crop contamination. Unlike the StarLink cases, future cases of pollen drift will probably involve crops approved for human consumption. The courts are likely to follow the Federal Government in determining that pollen from GE-crops is no different from traditional pollen. On the other hand, if the

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identify a commercial variety. *Id*.

177. *See* Lilliston, *supra* note 13, at 29 (stating that "there is no case law related to genetically altered crops, and no laws have passed . . . assigning liability").

178. *Cf.* Angharad M.R. Gatehouse et al., *The Case of the Monarch Butterfly: A Verdict is Returned*, 18 TRENDS IN GENETICS 249, 249-56 (2002) (explaining one method of "quantifying the hazard").

179. *Cf.* Lilliston, *supra* note 13, at 28-29 (describing various cases and demands by each of the plaintiffs).

180. *See* Donald L. Uchtmann, *Biotechnology and Specialty Crops*, *in* 2 ILLINOIS LAW AND AGRIBUSINESS ch. 11, § 26 (James D. Cottrell & Jeffrey A. Mollet eds., 2001) (discussing the StarLink-related class actions).

courts determine that growers of GE-crops commit trespass or nuisance by spreading GE-pollen, the entire market for GE-seed would be chilled by fear of lawsuits. The safer course of action for both sides may be to avoid the courts and leave the issue unresolved.

V. CONCLUSION

Genetic engineering offers seed companies new markets. GE-seeds offer farmers new tools in crop production. Unfortunately for those on the edge of the new frontier, not everyone wants to eat GE-crops. Because growers can receive a premium for non-GE seed, a loss of that premium due to contamination is likely to lead to lawsuits.

Rather than let the issue self-destruct in the courts, why not change the rules of the game? If private organic certification programs allowed for some tolerance of GE-contamination, then an organic farmer would not have to be so wary of GE-pollen drifting from field to field. The EPA, FDA, and USDA have all approved GE-crops and regulate the labeling of organic and non-GE-foods. Instead of ducking responsibility, the federal agencies should mandate what amount of contamination is actionable or at least provide guidance as to what conduct would not be actionable.

One factor that muddles the issue is media sensationalism.[181] Various groups oppose genetic engineering and many exist only to oppose biotechnology.[182] The public has shown suspicions of GE-foods.[183] Two commentators have considered the reasons for the piqued public interest:

> When barraged with sensationalistic news stories and overblown allegations by anti-biotech groups, consumers' suspicions about genetically engineered food and other aspects of biotechnology are naturally raised. Perhaps what makes biotechnology most vulnerable is that it deals with fundamental aspects of life.[184]

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181. Deacon & Paterson, *supra* note 75, at 599 (citing various examples of highly publicized GE stories).

182. *See id*. at 601 (listing groups such as Greenpeace and the Center for Food Safety).

183. Endres, *supra* note 57, at 457 (explaining that major United Kingdom supermarkets had banned GE-products and that a survey in the United Kingdom in 1999 revealed that most British citizens considered GE-foods unsafe to eat).

184. Deacon & Paterson, *supra* note 75, at 602.

Studies that would expose the dangers of growing GE-crops have also been published prematurely,[185] giving rise to anti-GE-crop sentiment before the studies are debunked.

Those seeking redress for damage due to crop contamination may seek public support for their cause, but such a view may not be supported by the law. In a court, the federal approval for GE-crops will likely be viewed as the embodiment of public opinion. Absent media sensationalism, GE-products will likely remain legal in the United States.[186]

Trespass and nuisance claims are not a likely source of liability. If courts allow non-GE-crop growers to file trespass actions against their neighbors for the spread of GE-pollen, the industry of GE-crops could be obliterated. Because GE-pollen can drift for miles, few farms would be isolated enough to avoid liability.[187] The public policy in favor of free farming would likely weigh against farmer liability based GE-pollen drift onto plaintiff's non-GE-crops.

Discussions of the theories of liability for crop-contamination may be wishful thinking. In the StarLink fiasco, much of the claim concerns failure of the seed company to achieve human use of StarLink seed and failure of the system to segregate GE-seed and non-GE-seed.[188] These issues all imply a pre-existing relationship between the parties. To avoid liability, agricultural businesses need only guarantee less from their services. Unless some regulatory system is introduced, the ultimate burden will eventually fall on those growing GE-crops and those who wish to avoid GE-crop contamination.

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185. *See* Gatehouse et al., *supra* note 178, at 249-51 (discussing the initial reports that Bt corn was harmful to monarch butterflies and the later studies which revealed that use of Bt corn instead of pesticides may be beneficial to the butterflies); Marc Kaufman, *Journal Editors Disavow Article on Biotech Corn*, WASH. POST, April 4, 2002, at A3 (discussing the "highly unusual 'editorial note'" in which the journal *Nature* concluded that an article concerning the danger of GE-crop contamination of indigenous Mexican corn should not have been published).

186. *See* Deacon & Paterson, *supra* note 75, at 589.

187. *See* Lilliston, *supra* note 13, at 26.

188. *See Bayer Rejects Liability for StarLink*, *supra* note 41, at 8 (stating that StarLink corn is not approved for human consumption in Europe, Japan, or the United States).