

The National Agricultural
Law Center



University of Arkansas · System Division of Agriculture
NatAgLaw@uark.edu · (479) 575-7646

An Agricultural Law Research Article

Drift of Patented Genetically Engineered Crops: Rethinking Liability Theories

by

Hilary Preston

Originally published in Texas LAW REVIEW
81 TEX. L. REV. 1153 (2003)

www.NationalAgLawCenter.org

Drift of Patented Genetically Engineered Crops: Rethinking Liability Theories[†]

I. Introduction

The issue of genetically engineered food has generated enormous discussion among consumers, corporations, non-profit organizations, and governments. Proponents of the technology tout genetically engineered food as the solution to world hunger.¹ Supporters also argue that genetically engineered crops will lessen the environmental impact of traditional² agriculture by reducing the use of chemical pesticides and herbicides.³ Opponents of genetically engineered food warn of myriad problems, including allergies in humans,⁴ pesticide and antibiotic resistance in other plants,⁵ increased use of pesticides and herbicides,⁶ loss of biodiversity,⁷ damage to non-targeted

[†] This Note would not have been possible without Percy Schmeiser and Candace Boheme, who brought this problem to my attention. I am grateful to Heidi Frahm, Heather Jones, and the entire membership of the Texas Law Review for their efforts in editing this Note. I would also like to thank Berry Flynn for her suggestions and her friendship. Most of all, I would like to thank my husband, Nick, for his enduring support and endless patience throughout law school and life.

1. See Monsanto Company, *Biotechnology Is Needed to Help African Farmers Fight Hunger* (Jan. 16, 2002), at <http://www.biotechknowledge.monsanto.com/biotech/knowcenter.nsf/ID/86256AEE0053885686256B4300625A56> (arguing that biotechnology could alleviate hunger and poverty in southern Africa). But see Miguel A. Altieri, *The Myths of Agricultural Biotechnology* (July 30, 2000), at http://www.saynotogmos.com/Biotech_myths.htm (emphasizing that biotech foods are best suited for large capital-intensive production and may actually harm Third World farmers).

2. In this usage, “traditional” connotes a method of farming that employs chemical pesticides, herbicides, and fertilizers. The term “traditional agriculture” is meant as a contrast to organic agriculture, which does not utilize chemical fertilizers, herbicides, or pesticides.

3. Monsanto Company, *Safety Assessment of Roundup Ready Soybean Event 40-3-2*, at 1 (Mar. 2002), at <http://www.monsanto.com/monsanto/content/our-commitments/roundupsoy-product.pdf> [hereinafter *Safety Assessment*]. But see *Genetically Modified Foods to Increase Herbicide Use, Coalition Warns*, PESTICIDE & TOXIC CHEMICAL NEWS, Oct. 9, 1996 [hereinafter *Coalition Warns*] (arguing that genetically modified foods “are likely to increase farmers’ reliance on herbicides” because these foods contain a natural toxin that will increase the rate at which insects develop immunity to a cotton plant pesticide, which “could render the cotton plant pesticide . . . ineffective”).

4. See, e.g., Richard A. Repp, *Biotech Pollution: Assessing Liability for Genetically Modified Crop Production and Genetic Drift*, 36 IDAHO L. REV. 585, 598 (2000) (describing a study demonstrating that a soybean containing a transplanted protein from a Brazil nut triggered nut allergies in persons tested).

5. See *id.* at 591 (noting that contamination may create resistant weeds); see also *Safety Assessment*, *supra* note 3, at 17 (acknowledging reports of pesticide resistance found in Australia).

6. See *Coalition Warns*, *supra* note 3.

7. See Klaus Bosselmann, *Plants and Politics: The International Legal Regime Concerning Biotechnology and Biodiversity*, 7 COLO. J. INT’L ENVTL. L. & POL’Y 111 (1996) (describing a link between the rise in biotechnology and the loss of biodiversity worldwide). But see 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, 166 (1998) (explaining that international treaties can protect biodiversity).

organisms,⁸ crop failure,⁹ unexpected changes in the altered plants,¹⁰ and ethical considerations.¹¹ Despite these potential concerns, the prevalence of genetically engineered organisms in agriculture is increasing at an alarming rate.¹² The pervasiveness of genetically modified products in food warrants a closer look at some of the risks involved. This Note will focus on one particular problem associated with genetically engineered organisms—genetic drift in agriculture. The phrase “genetic drift” is used to describe the problem of inadvertent spreading of genetically modified organisms (GMOs) from a farm choosing to use that technology to a neighboring farm that has chosen not to include GMOs as part of its crop.¹³ The Note uses the case of *Monsanto Canada Inc. v. Schmeiser*¹⁴ as a factual predicate for discussion.

Because many GMOs are protected by patents,¹⁵ this drift phenomenon requires a balancing of patent rights against farmers’ rights. Courts must evaluate the relative importance of the patent rights of the biotech companies, the farmers’ interests, environmental concerns, and long-range economic considerations.¹⁶ This Note will argue that the unique nature of the patents involved in genetic drift cases necessitates a reformulation of these

8. See John E. Losey et al., *Transgenic Pollen Harms Monarch Larvae*, 399 NATURE 214 (1999) (demonstrating a correlation between GMO-Bt corn and increased mortality in monarch butterflies).

9. See Repp, *supra* note 4, at 595–96 (illustrating many examples in which a genetically modified variety performed unexpectedly worse than its conventional counterpart).

10. See Barry Commoner, *Unraveling the DNA Myth*, HARPER’S MAGAZINE, Feb. 2002, at 39 (reporting that “[d]espite the biotechnology industry’s assurances that genetically engineered soybeans have been altered only by the presence of the alien gene, as a matter of fact the plant’s own genetic system has been unwittingly altered as well” and that “[a]ny artificially altered genetic system . . . must sooner or later give rise to unintended, potentially disastrous, consequences”).

11. See, e.g., Baruch A. Brody, *An Evaluation of the Ethical Arguments Commonly Raised Against the Patenting of Transgenic Animals*, in ANIMAL PATENTS: THE LEGAL, ECONOMIC, AND SOCIAL ISSUES 141 (William G. Lesser ed., 1989); Rebecca Dresser, *Ethical and Legal Issues in Patenting New Animal Life*, 28 JURIMETRICS J. 399, 410 (1988) (noting that the ethical concerns brought about by recent advances in biotechnology and patents of higher life forms are that these advances “threaten[] such crucial moral values as respect for God, species integrity, [and] the value of human life,” and ultimately arguing that patent law is not the appropriate method for regulating genetic research).

12. See Repp, *supra* note 4, at 588 (“By 1999, approximately one-fourth of U.S. cropland—more than ninety million acres—was planted with GM crops. GMOs now account for more than thirty-five percent of all corn, almost fifty-five percent of all soybeans, and nearly half of all cotton produced in the United States.”).

13. See *id.* at 587 (explaining the concept of “genetic drift” and arguing that this is one of the most significant risks associated with the increase in genetically modified crops).

14. [2001] F.C.T.D. 256 (Sask.), *aff’d*, [2002] F.C.A. 309 (Fed. Ct. App. Canada). Although the *Schmeiser* appellate decision affirms the lower court’s decision, the analysis in the appellate decision will be referenced when relevant.

15. See *J.E.M. Ag Supply v. Pioneer Hi-Bred Int’l, Inc.*, 534 U.S. 124, 127 (2001) (“The United States Patent and Trademark Office (PTO) has issued some 1,800 utility patents for plants, plant parts, and seeds . . .”).

16. See *Schmeiser*, [2002] F.C.A. 309, para. 51 (balancing the interests of the farmer, who “has legal title to any volunteer plant,” against “the rights of the holder of a patent for a gene found in the plant”).

patent infringement claims. Specifically, the Note advocates the addition of the element of intent as a component of an infringement claim for patents of genetically modified plants. As a secondary response to the problem of genetic drift, this Note will suggest modifications to the patents themselves and the strengthening of common-law remedies for farmers; both techniques could be helpful in rectifying the current problems associated with genetic drift jurisprudence.

II. Scientific and Legal Background on Genetically Altered Foods

A. *Scientific Background*

Genetically engineered crops are produced by taking a gene from one organism and inserting it into the genetic make-up of another species.¹⁷ The spliced genes are chosen from organisms with some desirable trait lacking in the to-be-modified organism.¹⁸ Genes are moved not only between species but also between the plant and animal kingdoms. For example, a cold-resistant gene from fish has been inserted into tomatoes to improve their hardiness to cold.¹⁹ Because genes are translated from one organism to another, the result is often labeled transgenic.²⁰ The phrases “transgenic,” “genetically engineered,” and “genetically modified” all describe the same process and may be used interchangeably.²¹

B. *Legal History of Genetically Engineered Plants*

The products of genetic-engineering technology have been patentable since 1980, when the Supreme Court decided the case of *Diamond v. Chakrabarty*.²² Since that time, thousands of patents have issued for genetically engineered organisms.²³ The type of patent held by Monsanto Canada Inc.²⁴ protects not only the genetic material in the seeds purchased but also the next generation of seeds and any plants resulting from a hybrid

17. See *Monsanto Co. v. Trantham*, 156 F. Supp. 2d 855, 858 (W.D. Tenn. 2001) (involving the insertion of genes into cottonseed and soybeans to make the plants resistant to herbicide).

18. Dunn, *supra* note 7, at 149.

19. See *id.* at 146.

20. See James F. Ewing, *Agricultural Biotechnology: Is the International Regulation of Transgenic Agricultural Plants for the Birds (and the Bees)?*, 25 SUFFOLK TRANSNAT'L L. REV. 617, 617 (2002) (describing the creation of “the first transgenic plant by splicing a bacterium gene into a petunia”).

21. See AMERICAN HERITAGE DICTIONARY 1901 (3d ed. 1992).

22. 447 U.S. 303, 309 (1980) (holding that an organism that contains “a nonnaturally occurring manufacture or composition of matter—a product of human ingenuity” is patentable).

23. See *J.E.M. Ag Supply v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 145 (2001) (acknowledging that the *Chakrabarty* decision ultimately resulted in the issuance of 1,800 utility patents for plants).

24. Monsanto is the plaintiff in the model case of *Monsanto Canada Inc. v. Schmeiser*, [2001] F.C.T.D. 256 (Sask.).

of genetically engineered plants and non-GMO plants.²⁵ Some debate exists over whether this type of patent should be granted,²⁶ but a full discussion of that issue is beyond the scope of this Note.

III. A Genetic Drift Scenario

The case of *Monsanto Canada Inc. v. Schmeiser*²⁷ provides the model scenario illustrating the unique problems associated with inadvertent spread of genetically engineered organisms in agriculture. In that case, Mr. Schmeiser farmed a large plot of land with conventional, that is, non-genetically engineered, canola.²⁸ Many of the surrounding farms utilized Roundup Ready canola, a genetically modified canola engineered to be resistant to glyphosate, an herbicide present in Roundup, which is manufactured by Monsanto.²⁹

The controversy began when Roundup Ready canola was detected on Mr. Schmeiser's property by Monsanto investigators, who tested the perimeter of Mr. Schmeiser's crops in response to an anonymous tip.³⁰ Some debate exists about how the genetically modified canola arrived on Mr. Schmeiser's farm. He contends that it arrived either by wind drift of seeds from neighboring farms or passing trucks or by cross-pollination from those farms.³¹ Monsanto contends that Mr. Schmeiser purposefully planted the Roundup Ready canola.³² Setting aside this dispute momentarily, let us look at the outcome of the case. After Monsanto became aware of the presence of their patented technology on Mr. Schmeiser's property (by sampling crops from the perimeter of the farm), they sued him for patent infringement in Canadian Federal Court.³³

Monsanto's patent for the gene inserted to make Roundup Ready seeds mandates that every purchaser of the seed sign a Grower's Agreement and a Technology Use Agreement.³⁴ These two documents prescribe the conditions under which a farmer may use the patented seeds. The farmer can use the seed for one-time planting and may only sell it to a commercial purchaser

25. See *id.* paras. 15–28.

26. See *J.E.M. Ag Supply*, 534 U.S. at 147 (Breyer, J., dissenting) (arguing that the Plant Patent Act and the Plant Variety Protection Act should provide the exclusive patent protection for plants, meaning that patents that protect the offspring (whether hybrid or by direct seed) should be disallowed). The possibility of rewriting the style of plant patents is discussed *infra* in subpart VI(A).

27. [2001] F.C.T.D. 256 (Sask.).

28. *Id.* para. 7.

29. *Id.* para. 33.

30. *Id.* para. 37.

31. *Id.* para. 117.

32. *Id.* para. 4.

33. *Id.* paras. 36–41.

34. *Id.* para. 8; see also *Monsanto Co. v. Trantham*, 156 F. Supp. 2d 855, 858 (W.D. Tenn. 2001) (involving an agreement virtually identical to that in the *Schmeiser* case).

authorized by Monsanto for consumption.³⁵ The farmer may not sell or give the seed to anyone else, and he is prohibited from saving the seed for re-planting the following year.³⁶ The Technology Use Agreement also authorizes Monsanto to enter the contracting farmer's land to verify compliance with the agreement.³⁷ Accordingly, the court reasoned, if any person knowingly "uses"³⁸ a plant containing the patented gene without having paid for the seed or having signed the requisite agreements, he has violated the terms of Monsanto's patent.³⁹ No determinative inquiry into how that farmer came to be in possession of the patented seed is necessary.⁴⁰

The court ruled in favor of Monsanto and awarded thousands of dollars in damages for the infringement.⁴¹ The court did not resolve the dispute over the origin of the Roundup Ready canola, holding that this was not relevant to the outcome of the case⁴² because a patent infringement claim does not have intent as an element of the infringement.⁴³ While this legal rule may be well-suited to patent infringement claims involving many other types of patents,⁴⁴ this Note will argue that it is not appropriate when the patented material is self-propagating.⁴⁵ The unique situation of having patented material within

35. *Monsanto Canada Inc. v. Schmeiser*, [2001] F.C.T.D. 256, para. 13 (Sask.).

36. *See id.*

37. *See id.* paras. 13–14.

38. For a more detailed explanation of what is meant by "use" in this context, see *infra* note 109.

39. *See Schmeiser*, [2001] F.C.T.D. 256, paras. 13–14.

40. *See id.* para. 119 ("[T]he source of the Roundup resistant canola in the defendant's 1997 crop [from which the defendant saved seed for the infringing 1998 crop] is really not significant for the resolution of the issue of infringement which relates to the 1998 crop."). The appellate court also decided that it did not matter how the GMO plants arrived on the farm; that court focused instead on the knowledge of the farmer, reasoning that if the farmer saved seed from plants that he "knew or should have known . . . were glyphosate resistant" and then cultivated and sold the resulting plant, the farmer would be liable for patent infringement. *See Schmeiser v. Monsanto Canada Inc.*, [2002] F.C.A. 309, paras. 58–60 (Fed. Ct. App. Canada) ("[T]he source of the seed for the 1997 crop is irrelevant.").

41. *See Schmeiser*, [2002] F.C.A. 309, paras. 128–40 (awarding Mr. Schmeiser's full profits for the year as damages while also ordering Mr. Schmeiser to deliver "any plants or seeds from the 1997 and 1998 crops, or other plants or seeds known, or which ought to be known, by the defendants to be Roundup tolerant").

42. *See supra* note 40 and accompanying text.

43. For a survey of the American jurisprudence on intent to infringe, see *infra* Part V.

44. *See infra* subparts VII(A–B).

45. The appellate court in the *Schmeiser* case acknowledged that "the patented Monsanto gene falls into a novel category" because it is "found within a living plant that may, without human intervention, produce progeny containing the same invention." *Schmeiser*, [2002] F.C.A. 309, para. 57. Additionally, the court stated that it left open the question of whether Monsanto could enforce a claim against a farmer who inadvertently comes into possession of a GMO plant but does nothing "to cause or promote the propagation of the plant or its progeny (by saving and planting the seeds, for example)." *Id.* Nevertheless, the court upheld the claim against Mr. Schmeiser. In so doing, the court demonstrated that the critical element, in its analysis, was Mr. Schmeiser's actual or constructive knowledge that he was saving seed from Roundup Ready plants. *See supra* note 40. The court thus applied a knowledge standard; this Note argues for an intent-to-acquire standard.

an organism that is self-propagating necessitates an alteration of the relevant jurisprudence.

Although *Schmeiser* is a Canadian case, the facts nevertheless illustrate the type of problem cropping up across North America.⁴⁶ Additionally, current American jurisprudence suggests that the same result would be reached in courts within the United States.⁴⁷

This Note will demonstrate why the outcome and legal reasoning of this case present a dangerous precedent—one that will exacerbate many already existing problems associated with genetically engineered foods and agriculture and will also likely create new problems. The Note will then suggest a reformulation of the governing theories of liability that should alleviate these problems. Specifically, the Note will argue that a patent infringement claim of this variety—one in which the alleged infringement occurs by possession of patented, genetically engineered organisms in agriculture—should have intent to infringe as an element of the claim. Additionally, this Note will argue that the theories of trespass and nuisance should be available to the farmer upon whose land the patented crop has spread; these common-law claims must not be systematically outweighed by the statutory patent infringement claim.

IV. Implications of the *Schmeiser* Decision

The legal analysis and result in the *Schmeiser* decision, if applied in other cases, present two main problems, one for farmers specifically and the other for the agricultural economy generally. To understand the first of these problems, the scenario must be developed slightly.

A. Implications for Farmers

The *Schmeiser* court states that the process by which the patented seed arrives upon the defendant-farmer's land is irrelevant to the outcome of the case.⁴⁸ Additionally, the reasoning places an affirmative duty on the farmer, if he knows or has reason to know of the patented genes' presence, to notify

46. In fact, Monsanto spokesperson Trish Jordan acknowledges that the company's success against Mr. Schmeiser "has resulted in the company pursuing a number of other cases . . . that it has been investigating." Murray Lyons, *Monsanto Ready to Wage War*, SASKATOON STAR PHOENIX, July 19, 2001, available at <http://www.percyschmeiser.com/war.htm>.

47. See, e.g., *J.E.M. Ag Supply v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124, 127 (2001) (holding that a plant utility patent "protects both the seeds and plants of the [patented] line and the hybrids produced by crossing the protected [patented] line with another . . . line"); *Monsanto Co. v. Trantham*, 156 F. Supp. 2d 855, 868 (W.D. Tenn. 2001) (deciding that in the absence of a signed licensing agreement, the defendant's use of patented technology in growing cotton and soybean crops constituted an infringement in the plaintiff's patent); see also *infra* Part V (demonstrating that intent is not an element of patent infringement under U.S. law). I will refer to this jurisprudence as *Schmeiser*-pattern decisions.

48. See *supra* note 40.

the patentee of this intrusion.⁴⁹ This combination places a heavy duty of containment on the farmer who chooses not to farm with genetically engineered crops. Not only does this scenario raise serious equitable considerations,⁵⁰ it also has significant pragmatic implications. Consider, for example, the consequences of applying the current patent infringement jurisprudence to agriculture. The *Schmeiser* court found that the defendant violated Monsanto's patent by growing and selling canola from seeds that he knew, or should have known, were Roundup-tolerant.⁵¹ The origin of the seed was irrelevant.

While it must be acknowledged that the court found that Monsanto, if notified of the presence of unwanted Roundup-tolerant canola, would remove the patented plants,⁵² I argue that this is not an adequate solution. This effectively prohibits a farmer, who has reason to know of the presence of patented material on his land, from saving seed in the way he has for years, despite the fact that the farmer has done nothing differently from years past. That is, he has taken no deliberate steps to acquire the patented material. Consider a farmer's options once he has reason to know of the presence of GMO crops on his land. Presumably, under *Schmeiser's* reasoning, he has a duty not to save seed from these crops. But how can he distinguish the GMO crops from his conventional crops, if they are not visibly distinguishable?⁵³ He would probably use the same test as the Monsanto inspectors—spraying the crops with Roundup.⁵⁴ The reader will immediately notice the Catch-22 in this situation. All of the farmers' conventional crops will be killed by the spraying, and only the GMO crops, which are owned by the patentee, will remain. By diligently trying to avoid a patent infringement claim, the farmer is left with no crops to sustain his profit for the year. Additionally, he will be unable to save seed, so he must purchase entirely new seed for next year's planting. If the farmer does not go through this process and instead saves seed as he has for years past, he opens himself up to a patent infringement suit, which could cost him the full profits of his crop.⁵⁵ This dilemma could easily be repeated year after year as volunteer⁵⁶ GMO plants return. The

49. For a thorough discussion of this affirmative duty, see *infra* subpart VII(C).

50. See *infra* subpart VII(D).

51. See *Monsanto Canada Inc. v. Schmeiser*, [2001] F.C.T.D. 256, para. 123 (Sask.).

52. See *id.* para. 126.

53. See *id.* paras. 38–59 (describing the rigorous and extensive testing necessary to determine the extent of the GMO canola on Mr. Schmeiser's property).

54. See *Schmeiser v. Monsanto Canada Inc.*, [2002] F.C.A. 309, para. 13 (Fed. Ct. App. Canada) (“A Roundup Ready Canola plant cannot be distinguished from other canola plants except by a chemical test that detects that presence of the Monsanto gene, or by spraying the plant with Roundup.”).

55. See *id.* paras. 138–40.

56. In botany, the term “volunteer” refers to “a cultivated plant growing from self-sown or accidentally dropped seed.” AMERICAN HERITAGE DICTIONARY 2003 (3d ed. 1992).

already cash-poor farmer has now lost his only significant source of income and has a farm infiltrated with GMO crops.

Even after the complete disposition of this initial conflict between the farmer and the patentee, the farmer is still in a difficult position. Effectively, he has two options: (1) paying to remediate his farm or (2) entering into a contractual relationship with the patentee to grow the GMO crop.⁵⁷ The first option can be expensive and incredibly difficult. The GMO varieties are often persistent and can remain as volunteers long after the contaminated property has been resown.⁵⁸ This suggests that completely ridding a farm of unwanted GMO crops requires replacing the soil on the farm, a process that incurs prohibitive costs.⁵⁹ The farmer, with little to no investment capital, will likely be unable to employ these remedial measures and will be unable to restore his land and his crop to the previously pure state.⁶⁰ Consequently, the farmer's crop—which has by this point, if not earlier, cross-pollinated with the GMO plant—is irreversibly a GMO product. The farmer, if unable to pay to remediate the land, will be tied to the patentee. The farmer could be liable for seeds and for continuing technology and usage fees if he is unable to eradicate the product from his property.

If this scenario occurs in farms across the country, the farmers' lack of investment capital could mean that many farms will inevitably switch from conventional farms to GMO farms, despite farmers' intentions to avoid growing genetically engineered crops. Given the many risks associated with

57. These are the farmer's only two options because unless and until he can eradicate the GMO seed from his property, he will be continually growing patented plant matter, which, under the current jurisprudence, is an infringement of that patent. While evidence in the *Schmeiser* case suggests that Monsanto, if notified of its presence, will remove patented plants that arrive on a farm inadvertently, see *Schmeiser*, [2001] F.C.T.D. 256, para. 126, this does not solve the complete remediation problem. See *supra* text accompanying notes 50–56 for an explanation of why this solution is inadequate. If the farmer is unable to completely remediate his land, his only other option to avoid repeatedly infringing the patent is to abide by the specific requirements of the patent—namely, to enter into a contractual arrangement with the patentee.

58. See *Schmeiser*, [2001] F.C.T.D. 256, para. 59 (acknowledging that even though the defendant purchased an entirely new inventory of non-GMO seed, volunteer GMO plants were still found by defendant on his property); Percy Schmeiser, *The Contamination Continues*, at <http://www.percyschmeiser.com/contamination> (last visited Sept. 9, 2002) (noting that GMO plants persisted after the land was completely cleared and resown with fresh, non-GMO canola seed).

59. Consider the retail cost of topsoil, 98 cents per 40-pound bag. See <http://www.homedepot.com> (last visited Sept. 21, 2002). One 40-pound bag covers a square yard, to a depth of one foot. Nearly 5,000 bags would be needed simply to cover one acre. Even for a moderately sized farm like Mr. Schmeiser's, the retail cost of re-soiling his property quickly reaches into the millions. While bulk discounts could undoubtedly be obtained, the costs would still be quite large.

60. Many farmers completely lack investment capital. They depend on the proceeds of one year's crop to pay for the operating costs for next year's crop. Federal assistance is often needed to cover the shortfall. See *Mid-Session Review Clouds Future Ag Spending*, at <http://www.nfu.org> (last visited Dec. 18, 2002) (noting that \$5.5 billion was spent on direct crop assistance to farmers in 2001).

GMOs, this scenario demonstrates that liability theories associated with genetically engineered crop drift need to be altered.⁶¹

The economic damages resulting from the above-described scenario become magnified when an organic farmer operates adjacent to a genetically engineered crop. While many of the concerns are the same, organic farmers face the additional, and quite substantial, problem of losing their organic certification.⁶² Organic crops are sold at a premium that will not be available to a farmer exposed to GMO drift.⁶³ A parallel situation is illustrated by the case of *Langan v. Valicopters, Inc.*,⁶⁴ in which an organic farmer lost his certification after trace amounts of pesticides were found on his crops. The court held that losing organic certification amounted to a substantial economic loss for the organic farmers.⁶⁵ The court found the loss sufficiently severe to impose strict liability on the aerial crop dusters who caused the de-certification by spraying pesticides on an adjacent farm.⁶⁶ An invasion of GMOs, which would also cause de-certification, is arguably more severe; GMO seeds, pollen, and volunteer plants are much more difficult to eradicate than pesticides, which will eventually biodegrade.⁶⁷

B. Implications for the Agricultural Economy

Another problematic implication of *Schmeiser*-pattern decisions is the impact they could have on the agricultural economy as a whole. Genetic drift and subsequent GMO invasion suggest that a concentration of power in agriculture—even more so than is present today⁶⁸—would result from the *Schmeiser* scenario. Monsanto's patent provides that the offspring of a cross between a patented plant and a conventional plant is also afforded patent

61. For an overview of the aforementioned risks, see *supra* notes 4–11 and accompanying text.

62. See The National Organic Program, at <http://www.ams.gov/nop/factsheet/CertificationE.html> (announcing the possibility of periodic inspections by certifying agents, including residue tests, to ensure continued compliance with organic certification requirements).

63. See *id.* at <http://www.ams.gov/nop/Q&A.html> (noting that if a certifying agent suspects contamination of an organic product by a prohibited substance, including GMO contamination, the certifying agent may order testing and subsequent de-certification).

64. 567 P.2d 218 (Wash. 1977).

65. See *id.* at 222 (“Once an organic farmer loses his certification, it is highly unlikely that he will be able to sell his crops on the regular commercial market due to his failure to enter into contracts with commercial produce buyers before the season begins, and, even if he could sell his crops to a commercial produce buyer, the farmer would be unable to command as high a price for his goods as he could on the organic market.”).

66. See *id.* at 223.

67. See Repp, *supra* note 4, at 591–93 (discussing contamination of conventional crops by GMOs).

68. See generally Mary Hendrickson et al., *Consolidation in Food Retailing and Dairy: Implication for Farmers and Consumers in a Global Food System*, REPORT TO THE NATIONAL FARMER'S UNION, at 13 (Jan. 8, 2001), available at <http://www.nfu.org/images/heffernan.pdf> (last visited Dec. 15, 2002) (demonstrating the extent of the domination of modern agriculture by a few large companies).

protection if the progeny contains the patented gene. While the farmer owns the genetically modified plant, that ownership is subject to Monsanto's patent of the gene.⁶⁹ If the farmer is unable to insulate himself from the GMO drift, significant potential monopolization problems exist. Each invaded crop will be ultimately controlled by the patentee. "The offense of monopoly . . . has two elements: (1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident."⁷⁰ Although it is outside the scope of this Note, it would be interesting to investigate whether a case could be made that biotechnology companies, by knowingly creating a self-propagating patented product that is often hardier than conventional varieties, have engaged in monopoly tactics.

GMO drift and the *Schmeiser* precedent present an additional problem when the world-wide resistance to GMOs is considered. Many European countries have banned the importation of GMO food items.⁷¹ This change has already had a significant impact on the sales practices of domestic farmers.⁷² If the *Schmeiser* doctrine is relied on, and more farms are inadvertently transformed from conventional to GMO farms, this problem will be magnified. The invasion of GMO crops onto non-GMO cropland, combined with the lack of remedies for the invaded farmer, significantly limits the available market for the invaded farmer's crop.⁷³

Aside from the concerns outlined above—harm to the farmer and the agricultural economy—many other problems resulting from genetic drift also exist. For example, genetic drift could cause the eradication of some natural species. If the creators and users of GMOs are not required to contain their crops to prevent genetic drift, this increases the likelihood that genetically engineered varieties could hybridize with natural varieties, forever altering the genetic make-up of those plants.⁷⁴ The legal reformulations proposed

69. See *Monsanto Canada Inc. v. Schmeiser*, [2001] F.C.T.D. 256, para. 83 (Sask.) (stating that a crossbred plant that contained the patented gene would be subject to Monsanto's patent, but that a crossbred plant that did not contain the modified gene would not be).

70. *United States v. Grinnell Corp.*, 384 U.S. 563, 570–71 (1966).

71. See David Evans, *Global GM Crop Plantings Top 50 Million Hectares*, REUTERS POLL, at 2 (Jan. 10, 2002), available at http://www.portaec.net/library/food/global_gm_crop_plantings_top_50.html ("European Union governments have blocked the approval of new GM crops since 1998 . . .").

72. See Repp, *supra* note 4, at 593 ("The U.S. grain industry has lost virtually all of the \$200 million annual export market for sale of corn to the EU . . . as a result of EU regulations restricting the import of GM corn . . .").

73. See *id.* (discussing market restrictions on "contaminated non-GM crops").

74. See C.N. Stewart et al., *The Movement of an Insecticidal Transgene from Canola into Weeds: Hybridization, Introgression, and Ecological Effects* (Apr. 7, 2000), at <http://www.aphis.usda.gov/biotech> (last visited Dec. 15, 2002) (reporting that field tests demonstrate that genetically engineered canola easily hybridizes with two wild varieties).

below, by reducing the likelihood and severity of genetic drift, will also serve to alleviate this problem.

As mentioned above, the *Schmeiser* decision held that intent to acquire was not a relevant consideration in a patent infringement claim.⁷⁵ This Note will propose the addition of the intent element. However, it is necessary first to undertake a survey of the U.S. jurisprudence regarding intent in patent infringement claims.

V. The Element of Intent to Infringe: Current Jurisprudence

In *Florida Prepaid Postsecondary Education Expense Board v. College Savings Bank*,⁷⁶ the Supreme Court only cursorily addresses the intent issue for patent infringement claims. The Court succinctly states that “[a]ctions predicated on direct patent infringement . . . do not require any showing of intent to infringe.”⁷⁷ The Court does not delve into the reasons behind this rule but simply states it as a well-established principle. Although the Court views this as an obvious and easily implemented standard, the variance with which the Circuits employ the rule demonstrates this is not so.

The Fifth Circuit seems to waver between emphasizing intent to infringe as an important part of the case and completely disregarding it. In *Hughes Tool Co. v. G.W. Murphy Industries*,⁷⁸ the court “recognize[s] that there may be times where literal infringement should be overlooked.”⁷⁹ The court suggests that a literal infringement does not justify a recovery for the patentee if “the allegedly infringing device only occasionally strays across the patent boundary” or if the infringement is “too trifling to justify judicial intervention.”⁸⁰ By disregarding “minor” infringements, the court is forgiving those infringers who did not intend to copy the patented design, thereby making intent a critical element of the case. Despite this somewhat charitable beginning for the alleged infringer, the court goes on to say “the fact that an infringer has attempted to avoid infringement and failed does not alter his basic liability.”⁸¹ This statement, although seemingly inconsistent with the court’s earlier statements, comports with the Supreme Court’s holding in *Florida Prepaid*, which emphasized that the infringer’s intent is an irrelevant consideration in a literal patent infringement case.⁸²

75. See *supra* notes 40, 45 (noting that the *Schmeiser* court held that the source of the GMO seed was not relevant, so long as the farmer had actual or constructive knowledge that he was saving seed from Roundup Ready plants).

76. 527 U.S. 627 (1999).

77. *Id.* at 645.

78. 491 F.2d 923 (5th Cir. 1974).

79. *Id.* at 927.

80. *Id.*

81. *Id.* at 928.

82. See *Fla. Prepaid Postsecondary Educ. Expense Bd. v. Coll. Sav. Bank*, 527 U.S. 627, 645 (1999) (stating that “[a]ctions predicated on direct patent infringement . . . do not require any showing of intent to infringe”).

In another Fifth Circuit case, the court wavers in this same fashion—first stating that infringement occurs “irrespective of the purpose and intent of the alleged infringer,” but then pointing out that “courts are not blind to these factors.”⁸³ However, the court takes notice only of cases in which the infringer’s intent exacerbated the infringement,⁸⁴ the court does not cite any cases in which the alleged infringer’s lack of intent to infringe exonerated the defendant.

The court’s wavering in *Hughes Tool* and *Thurber* suggests that the Fifth Circuit wants to consider intent to infringe in its ruling on infringement, but stops short of doing so, perhaps curbed by the Supreme Court’s decisive stance in *Florida Prepaid*. The Eighth Circuit echoes the Fifth Circuit’s opinion in *Hughes Tool*, holding that the party’s motivation to avoid infringement has no bearing on the finding of infringement.⁸⁵ However, the Eighth Circuit, unlike the Fifth Circuit, does not insinuate that literal infringement may be overlooked under certain circumstances.⁸⁶ In this way, the Eighth Circuit’s analysis more closely resembles the consistent position of the Sixth Circuit. The Sixth Circuit, while agreeing that proving intent to infringe is not necessary, goes even further, stating that knowledge of the patent’s existence is not required. This represents the most unforgiving position for the alleged infringer.⁸⁷

While the formulation of what role intent to, and knowledge of, infringement may play in a finding of infringement varies subtly from circuit to circuit, as demonstrated by the above brief survey, all ultimately agree that intent is not a critical element of the infringement claim. This rule is inappropriate for GMO drift situations. Critical differences in the type of patent involved and the manner of infringement mandate a variation of the current rule for GMO drift. The *Schmeiser* decision also places an inappropriate affirmative duty on the non-GMO farmer. Furthermore, equitable concerns support altering the rule. These significant revisions in the patent infringement claim will be discussed in Part VII. Before articulating those proposed changes, this Note will briefly address two other techniques that could be used to alleviate the problems currently associated with genetic drift in agriculture.

VI. Alternate Responses to the Problem of Genetic Drift

In addition to the proposition of reformulating the elements of a direct patent infringement claim, there are alternative techniques for dealing with

83. *Thurber Corp. v. Fairchild Motor Corp.*, 269 F.2d 841, 845 (5th Cir. 1959).

84. *Id.* at 845–47.

85. *Kell-Dot Indus. v. Graves*, 361 F.2d 25, 28–29 (8th Cir. 1966).

86. *Id.*

87. *See Schnadig Corp. v. Gaines Mfg. Co.*, 620 F.2d 1166, 1168 n.3 (6th Cir. 1980) (“[A]n ‘inventor’ who produces something already patented infringes the patent regardless of his knowledge of its existence.”).

the *Schmeiser* problem. Two of those possibilities will be described below: (1) changing the way plant patents are written and (2) giving the common-law theories of nuisance and trespass, which are already available to the farmer, more weight relative to the patentee's claim of direct infringement.

A. *Changing the Form of Plant Patents*

The *Schmeiser* problem exists only because the underlying patents grant protection not only to the first generation of plants derived from the patented seed, but also to the subsequent generations and any derivative hybrids. The Supreme Court endorsed this interpretation of the patent statutes in *J.E.M. Ag Supply v. Pioneer Hi-Bred International, Inc.*⁸⁸ In that case, the Court agreed with the petitioner that a utility patent issued under 35 U.S.C. § 101 protects all seeds, offspring, and hybrids that contain the patented technology.⁸⁹

However, an alternative analysis is possible. As the dissent in *Pioneer Hi-Bred* argues, one may read the patent statutes to require that certain plant patents provide protection only to the plants themselves and not to offspring or hybrids.⁹⁰ This analysis flows from the comparison of the Utility Patent Statute with the Plant Patent Act and the Plant Variety Protection Act. The majority argues that the Plant Patent Act is not the exclusive technique for protection of these types of plants,⁹¹ and that in fact, the patentee has the option of choosing under which patent he would like to seek protection.⁹² In the dissent, Justice Breyer, argues that plants that fall under the latter two statutes are not entitled to patent protection under the Utility Patent Statute.⁹³ Under his analysis, the GMO crops are only entitled to the more specific patent protection of the Plant Patent Act. This Act, however, leaves "plant buyers free to keep, to reproduce, and to sell seeds."⁹⁴ Accordingly, the patents currently governing GMO crops would have to be rewritten to comply. If this change occurred, the hybrids, pollen, and second-generation seeds that invade non-GMO farmland and are derived from purchased, patented GMO seeds (presumably purchased by the neighbors) would not be subject to patent protection. Consequently, Mr. Schmeiser would not be subject to a claim of patent infringement.

B. *Common-Law Theories Protecting the Farmer*

When considering an invasion onto property, many legal minds jump immediately to the common-law theories of nuisance and trespass as protec-

88. 534 U.S. 124 (2001).

89. *Id.* at 143.

90. *Id.* at 149–51 (Breyer, J., dissenting).

91. *Id.* at 132–33.

92. *See id.* at 144 (holding that patent statutes may overlap "to protect the same commercially valuable attribute" and confer "dual protection").

93. *Id.* at 149–50 (Breyer, J., dissenting).

94. *Id.* at 151 (Breyer, J., dissenting).

tion for the one invaded. These theories are equally applicable to the GMO drift situation, but courts have yet to use these techniques to protect the farmer. Courts seem to give the patent rights of the biotech corporation precedence over the property rights of the farmer.⁹⁵ This section will briefly discuss the applicability of trespass and nuisance.⁹⁶

1. *Trespass*.—Trespass is defined as “[a]n invasion (a) [that] interfered with the right of exclusive possession of the land, and (b) [that] was a direct result of some act committed by the defendant.”⁹⁷ These elements are easily applicable to genetic drift. The physical invasion of the GMO plants, seeds, or pollen violates the non-GMO farmer’s right to exclusive possession of his land; this invasion is directly traceable to the defendant’s act of planting a GMO crop. The fact that the invasion may be by microscopic materials—pollen and seeds—should not prohibit a successful trespass suit for the invaded farmer.

The well-known case of *Martin v. Reynolds Metal*⁹⁸ provides the most instructive precedent on this point. In that case, a trespass was found even though the only intrusion was of microscopic flouride particles.⁹⁹ The court modernized the traditional view of trespass to include invisible invasion when those invasions are shown to cause damage.¹⁰⁰ Subsequent court decisions have also recognized an invisible invasion as a trespass upon a showing of damage to the plaintiff.¹⁰¹

While a farmer whose land has been invaded by GMOs could bring an action for trespass, it is important to note that this would be an action against

95. See, e.g., *Monsanto Canada Inc. v. Schmeiser*, [2001] F.C.T.D. 256, para. 91 (Sask.). The court acknowledged that:

While I acknowledge that the seed or plant containing [Monsanto’s] patented gene and cell may be owned in a legal sense by the farmer who has acquired the seed or plant, that owner’s interest in the seed or plant is subject to [Monsanto’s] patent rights, including the exclusive right to use or sell its gene or cell.

See also *Schmeiser v. Monsanto Canada Inc.*, [2002] F.C.A. 309, para. 51 (Fed. Ct. App. Canada) (“[T]he jurisprudence presents a number of examples in which the rights of ownership of property are compromised to the extent required to protect the patent holder’s statutory monopoly.”).

96. For a more thorough discussion of these issues, see Repp, *supra* note 4, at 600–13 (discussing theories of trespass and nuisance as applied to genetically modified crops that drift from farms).

97. WILLIAM L. PROSSER & W. PAGE KEETON, PROSSER AND KEETON ON THE LAW OF TORTS § 13 (5th ed. 1984).

98. 342 P.2d 790 (Or. 1959) (recognizing a trespass onto plaintiff’s property by emissions from the defendant’s plant which rendered the plaintiff’s land and drinking water unfit for grazing livestock).

99. *Id.* at 797–98.

100. *Id.* at 794.

101. See *Hall v. De Weld Mica Corp.*, 93 S.E.2d 56, 57 (N.C. 1956) (recognizing an invasion onto plaintiff’s property by a cloud of dust as a trespass since the silicon in the dust has the potential to cause injury).

the neighboring farmers, not against the biotech companies. Nonetheless, a successful trespass suit could have two results alleviating the problem of genetic drift: (1) By subjecting GMO farmers to damages, trespass suits could economically discourage the use of GMO crops; (2) By awarding damages, trespass suits could provide non-GMO farmers with the resources needed to remediate their lands after GMO contamination.

2. *Nuisance*.—"The essence of a private nuisance is an interference with the use and enjoyment of land."¹⁰² The interference must be both "substantial and unreasonable."¹⁰³ The damage caused by a GMO invasion argues strongly for seeing this interference as substantial.¹⁰⁴ To determine whether the interference is unreasonable, courts compare the utility of the defendant's conduct with the severity of the damage suffered by the plaintiff. This determination involves complex policy decisions regarding the benefits and dangers of genetically engineered crops.¹⁰⁵ Nevertheless, if a court gives credence to the concerns raised above,¹⁰⁶ an invaded farmer could succeed on a nuisance cause of action.

VII. The Element of Intent to Infringe: Proposed Modification and Justification

The aforementioned techniques are possible secondary solutions for the *Schmeiser* problem. The most promising legal reform has been alluded to before and will be described in detail below—adding an element of intent to patent infringement claims involving self-propagating GMOs. This reformulation is justified on four bases: (1) the type of infringement involved in a *Schmeiser* case is unique, (2) the type of patent involved in a *Schmeiser* case is unique, (3) the affirmative duty placed on the farmer to keep his property clear of GMO material is inappropriate, and (4) equitable concerns demand a showing of intent.

A. *Different Type of Infringement*

All of the cases described in Part V—and in fact the majority of patent infringement suits—involve an alleged infringer who has created or manufactured a product similar to the patented item. The *Schnadig* decision refers to an infringer who "produces" an item similar to that which is

102. PROSSER & KEETON, *supra* note 97, § 87.

103. *Id.* § 88.

104. See Repp, *supra* note 4, at 607–08 ("If farmers are forced to grow different crops, cease growing organic crops, or stop farming altogether because their land has been contaminated by GMOs, then they would foreseeably have a strong case that their interest in the use and enjoyment of their land has been invaded.").

105. See *supra* notes 1, 3–11 and accompanying text.

106. See *supra* notes 1, 3–11, 62–66, 72–73 and accompanying text.

patented.¹⁰⁷ The *Kell-Dot Industries* court describes the infringement as “manufacturing” of a similar machine.¹⁰⁸

The *Schmeiser* decision involves a markedly different situation; the alleged infringement occurred by *possession* of the patented seeds and plants without having signed a technology agreement, even though the initial possession was unintentional.¹⁰⁹ The plaintiffs did not allege that Mr. Schmeiser created or produced a genetically altered seed with the same characteristics as their Roundup Ready seed.¹¹⁰ The absence of an intent consideration in the former situations (in *Schnadig* and *Kell-Dot*) accords with the judicial preference to avoid litigating extraneous issues.¹¹¹ However, the consideration of the intent of the defendant is hardly extraneous when genetically modified crops drift onto a farmer’s property. If the manner of infringement is by simple possession of the patented item, then the issue of how the defendant came to possess that item is highly relevant. That is, the intent of the defendant becomes a critical determination in the case. If courts insist on adhering to a strict reading of this rule, we are stuck with the anomalous result that a defendant could unwillingly come into possession of the patented item and still be liable for patent infringement. This rule does not comport with nor does it further the purposes of patent protection.

Patent protection is granted so that the patentee can control who can capture the benefit of the patentee’s invention, and in what manner.¹¹² This goal is not furthered by making an innocent possessor of a patented item liable to the patentee. The innocent possessor derives no benefit from the

107. See *Schnadig Corp. v. Gaines Mfg. Co.*, 620 F.2d 1166, 1168 n.3 (6th Cir. 1980).

108. See *Kell-Dot Indus. v. Graves*, 361 F.2d 25, 28–29 (8th Cir. 1966).

109. See *Monsanto Canada Inc. v. Schmeiser*, [2001] F.C.T.D. 256 (Sask.) (“Growth of the seed reproducing the patented gene and cell, and sale of the harvested crop constitutes taking the essence of the plaintiffs’ invention, using it, without permission.”). To understand how this statement is tantamount to a finding that possession is infringement, the defendant’s noninfringing actions must be compared with the defendant’s infringing actions. For decades, the defendant grew canola and saved seeds from his crop for the next year; this was not infringement. When he infringed, defendant did the following—grew crops, saved seed, and had reason to know that some of his seed was resistant to Roundup. *Id.* para. 123. The only difference between his infringing and noninfringing actions is his possession—with knowledge or constructive knowledge—of GMO seeds. Thus, it can be said that the infringement is the knowing possession.

110. See *id.* (stating that the plaintiffs claimed the defendants infringed their patent by knowingly planting the patented seed).

111. Consider if the issue of intent to infringe were relevant in this type of patent infringement claim. Each trial would be reduced to an argument over whether the infringer knew about the patented item’s patent and to what extent he intended to copy that item when he created his own product. This discussion would distract from the real issue behind patent protection, the exclusive right to create and market a product one invented.

112. See Michael N. Rader, *Toward a Coherent Law of Inducement to Infringe: Why the Federal Circuit Should Adopt the Hewlett-Packard Standard for Intent Under § 271(b)*, 10 FED. CIR. B.J. 299, 299 (2000) (“In order to achieve the important goals of stimulating scientific progress, rewarding inventors for their efforts, protecting inventions from unauthorized modification or appropriation, and creating a just and attractive culture, United States patent law awards creators of useful, novel, and non-obvious inventions with patents.”).

patented goods¹¹³ and may even suffer harm by the invasion.¹¹⁴ This difference justifies adding the requirement of intent to infringe (or at least knowledge of infringement) in cases in which possession is a sufficient basis for infringement.

Some jurisdictions have explicitly stated that possession, without more, is not a sufficient basis for a claim of direct patent infringement. For example, in *L.A. Gear, Inc. v. E.S. Originals, Inc.*,¹¹⁵ the court proclaimed that “as a matter of law mere possession of a product or machine covered by a patent does not constitute infringement, absent a ‘threatened or contemplated’ use or sale.”¹¹⁶ Another court specified that to be liable, the alleged infringer must possess the patented product in the hope of deriving a profit from it.¹¹⁷

The *Schmeiser* scenario is closely analogous to this “innocent possession” scenario and should produce a similar result. The farmer who inadvertently comes into possession of the patented GMO and does not take advantage of the invention’s primary utility by spraying his crops with Roundup will not derive any profit from the GMO crop (at least not any above and beyond the profit his conventional crops would have created) and may indeed suffer a loss due to the GMO invasion.¹¹⁸ As such, the purposes of patent law demand that the farmer should not be held liable in the *Schmeiser* scenario.

It should be noted here that the claim of induced, or contributory, patent infringement does include knowledge of probable infringement as an element.¹¹⁹ Under this cause of action, a patentee may “sue companies that sell components of a claimed combination, or items used to practice a claimed method—even though the direct infringement is only performed by end users or consumers.”¹²⁰ While induced and contributory infringement are causes of action entirely distinct from the direct infringement alleged in

113. See *Schmeiser*, [2001] F.C.T.D. 256, paras. 121–22 (stating that it was immaterial that the defendant did not take advantage of the invention’s primary utility—its resistance to Roundup).

114. See *supra* subpart IV(A) (illustrating the potential damage to an organic farmer).

115. 859 F. Supp. 1294, 1298 (C.D. Cal. 1994).

116. *Id.* at 1298 (quoting 4 DONALD S. CHISUM, PATENTS § 16.02[4] (1993)); see also *Fausett v. Pansy Ellen Inc.*, 19 U.S.P.Q.2d 1228, 1230 (N.D. Ga. 1990) (holding that the protection afforded by a U.S. patent does not extend to goods that are manufactured and sold abroad, even if they are stored in the United States prior to delivery).

117. See *Beidler v. Photostat Corp.*, 10 F. Supp. 628, 630 (W.D.N.Y. 1935) (holding that “in the absence of proof that the machine is held for purposes of profit,” mere possession does not constitute infringement).

118. See *supra* notes 62–66, 72–73 and accompanying text.

119. See *Rader, supra* note 112, at 311–12 (emphasizing that a claim under 35 U.S.C. § 271(c) (contributory patent infringement) specifically requires the defendant’s knowledge of the likely infringement, while a claim under 35 U.S.C. § 271(b) (induced patent infringement) lacks such a textual requirement, but is nevertheless subject to an intent requirement due to judicial interpretation of the provision).

120. *Id.* at 304.

Schmeiser, the presence of the intent and knowledge requirements under those theories is mentioned here simply to highlight the fact that these elements are not entirely foreign to patent infringement doctrine.

B. *Different Type of Patented Item*

Parallel to the above-described difference—that the manner of the infringement is critically different from most patent infringement suits—is the important distinction between the type of patented item involved in the *Schmeiser* case and the type involved in most patent infringement claims. The vast majority of patents issue for inanimate devices, machines, or programs, not living things.¹²¹ Accordingly, it would not be a stretch to infer that the majority of patent infringement claims concern these types of products. None of the cases referenced in the previous section involve living organisms; they involve a sectional sofa,¹²² a steel and rubber seal,¹²³ a food processing machine,¹²⁴ and an automobile transmission.¹²⁵ In a patent infringement claim of this type, the issue of intent to infringe may justifiably be ignored.¹²⁶ However, when dealing with a patented, *self-propagating* organism, intent to infringe should be taken into consideration, especially when it is understood that current jurisprudence states that possession is sufficient to constitute infringement, even without an intent to possess.

The nature of the patented GMO product means that it could spread onto someone else's property, repeatedly recreating itself completely without human intervention or participation.¹²⁷ The problem here is more fundamental than a complaint about a lack of *mens rea* requirement. Here, we are blaming farmers for an infringement caused by a process in which they played no part. This cannot be the correct legal result. The combination of a self-propagating patent and possession being a sufficient basis for infringement demands an addition of intent to acquire as an element in this particular type of patent infringement claim.

C. *Affirmative Duty on the Farmer*

The controlling U.S. jurisprudence emphasizes that an alleged infringer will be liable on a claim of direct infringement if he uses the patented

121. Compare the total number of outstanding patents, numbering in the millions, to the number of patents issued for plants, roughly 18,000. See <http://www.uspto.gov/patft/index.html>.

122. *Schnadig Corp. v. Gaines Mfg. Co.*, 620 F.2d 1166, 1166 (6th Cir. 1980).

123. *Hughes Tool Co. v. G.W. Murphy Indus.*, 491 F.2d 923, 924 (5th Cir. 1974).

124. *Kell-Dot Indus. v. Graves*, 361 F.2d 25, 26 (8th Cir. 1966).

125. *Thurber Corp. v. Fairchild Motor Corp.*, 269 F.2d 841, 843 (5th Cir. 1959).

126. See *supra* subpart VII(A).

127. See *Schmeiser v. Monsanto Canada Inc.*, [2002] F.C.A. 309, para. 57 (Fed. Ct. App. Canada) (“[Monsanto’s gene] is a patented gene that may, without human intervention, produce progeny containing the same invention.”).

product—in this case “possess” is held equivalent to “use”¹²⁸—even without knowledge of the patent, intent to infringe, or knowledge of the infringement.¹²⁹ The *Schmeiser* decision imposes a knowledge requirement but refuses to give weight to whether the farmer had initial intent to acquire the GMO plant.¹³⁰ Maintaining this rule places an affirmative duty on the non-GMO farmer to patrol his land for possible GMO invasions once he has reason to know of their presence and subsequently notify the patentee.¹³¹ An affirmative duty is completely inappropriate in this context.

“As a general rule, the law imposes no duty on one person actively to assist in the preservation of the . . . property of another . . . even though the means by which the harm can be averted are in his hands.”¹³² Under the *Schmeiser* analysis, the court is attempting to do just that—to backdoor a duty on the farmer to keep his property clear of GMO invasions in order to protect the patentee’s property interest in the patent. Affirmative duties arise only in a limited number of situations: (1) from contracts,¹³³ (2) by statute,¹³⁴ or (3) when a special relationship exists either between the defendant and the injured party or between the defendant and the cause of the injury.¹³⁵ None of those three scenarios exist in the *Schmeiser* situation. The non-GMO farmer is not in a contractual relationship with the patentee; no statutorily-created affirmative duty exists for the non-GMO farmer; and no special relationship exists between the farmer and the patentee.

While it is commonly accepted that an affirmative duty to contact the patentee may be appropriate once the alleged infringer has notice of the potential infringement,¹³⁶ this affirmative duty is inappropriate here because of its difficulties of implementation. As explained above,¹³⁷ this is not an

128. See *supra* note 109. But see *supra* subpart VII(A) (arguing that possession, without more, should not qualify as a “use” of a patent).

129. See *supra* Part V (discussing U.S. jurisprudence regarding intent in patent infringement claims).

130. See *supra* notes 40, 45.

131. See *supra* subpart IV(A) (outlining farmers’ affirmative duty under *Schmeiser* to insure that no GMOs have contaminated their crops).

132. *Sidwell v. McVay*, 282 P.2d 756, 759 (Okla. 1955); see also *Louisville & N.R. Co. v. Scruggs & Echols*, 49 So. 399, 400 (Ala. 1909) (“The law imposes no duty on one man to aid another in the preservation of the latter’s property . . .”).

133. See *Saltiel v. GSI Consultant, Inc.*, 788 A.2d 268, 277 (N.J. 2002) (“[R]elationships created by contract can give rise to affirmative duties imposed by law.”).

134. See *County of Oneida v. Estate of Kennedy*, 734 N.Y.S.2d 402, 415–16 (Sup. Ct. 2001) (providing an example of a statutorily-created affirmative duty on the state).

135. See *Rubio v. Swiridoff*, 211 Cal. Rptr. 338, 340–41 (Ct. App. 1985) (“For nonfeasance [liability] to be applicable . . . there must exist a special relationship between the defendant and the person causing the harm, or between the defendant and the injured person.”).

136. See, e.g., *Crystal Semiconductor Corp. v. Tritech Microelectronics Int’l, Inc.*, 246 F.3d 1336, 1351 (Fed. Cir. 2001) (“When an infringer has actual notice of a patentee’s rights, the infringer has an affirmative duty of due care to avoid infringement.”).

137. See *supra* text accompanying notes 50–51.

effective solution to the problem. If the farmer has reason to know of the presence of GMO on his property, perhaps because of past invasions, his testing and the patentee's subsequent renewal of the infringing plants, leaves the innocent farmer with no crop for profit and no seed for next year (since he cannot safely save seed), and no compensation for the loss of his crops.¹³⁸ By reformulating the requirements of the direct patent infringement claim as it pertains to GMO drift to include an element of intent to acquire, this injustice would be rectified.

D. Equity Considerations

In the case of GMO drift, the above discussion demonstrates that the current jurisprudence must be changed. In addition to the manner of infringement, the type of patent, and the inappropriateness of the affirmative duty requirement, an additional reason mandates altering the current rule—equity. The *Schmeiser* case involves the biotech company Monsanto Canada. That corporation knowingly created a GMO that spreads and cross-pollinates easily.¹³⁹ Accordingly, they should bear the burden of controlling that spread. This idea of a dangerous or damaging activity “paying its own way” is expressed most frequently in the application of strict liability. According to The Restatement (Second) of Torts, strict liability should apply to a person carrying on abnormally dangerous activities. The determination of whether an activity is abnormally dangerous involves an inquiry into the following factors: “(a) existence of a high degree of risk of some harm to the person, land or chattels of others; (b) likelihood that the harm that results from it will be great; (c) inability to eliminate the risk by the exercise of reasonable care; (d) extent to which the activity is not a matter of common usage; (e) inappropriateness of the activity to the place where it is carried on; and (f) extent to which its value to the community is outweighed by its dangerous attributes.”¹⁴⁰ Many of the above-listed factors are triggered in the case of GMO farming.¹⁴¹ If farming with GMOs could be seen as an abnor-

138. *See id.*

139. *See* C.N. Stewart, *supra* note 74 (showing that all GMO canola tested will hybridize with wild varieties); David Quist & Ignacio H. Chapela, *Transgenic DNA Introgressed into Traditional Maize Landraces in Oaxaca, Mexico*, NATURE, Nov. 29, 2001, at 541 (demonstrating that GMO material can spread quite well and over long distances).

140. RESTATEMENT (SECOND) OF TORTS § 520 (1977).

141. Repp, *supra* note 4, at 619–20. These factors are triggered because

(1) growing GM crops involves a high degree of risk of genetic drift from pollen, plant seeds, and pests; (2) the gravity of harm to a non-GM grower could be very damaging because of market restrictions and/or crop failure; (3) the uncontrollability of genetic drift cannot be entirely eliminated even after establishing recommended buffer zones and otherwise exercising reasonable care in the production of GM crops; (4) although GM production may be the dominant production method in a particular area, it might not qualify as a matter of common usage because the total number of GM producers represent a minority of all farmers; (5) land adjacent to an organic farm or other non-GM farm is an inappropriate place for GM crop production because of the risk of

mally dangerous activity, it seems highly inappropriate to make the victim (the invaded farmer) liable to the cause of the damage (the GMO creator), simply because the cause of the invasion is protected by a patent.

VIII. The Effect of the Proposed Reformatations

On an academic level, these improvements will serve to rectify the legal inconsistencies and inequities of the current system. Adding intent to acquire as an element in the patent infringement cause of action for self-propagating GMOs will adapt the system to the unique nature of this type of patent. That modification will modernize the patent infringement claim and will acknowledge the substantial differences between the *Schmeiser* type of claim and a traditional cause for patent infringement.¹⁴² Strengthening the common-law remedies of trespass and nuisance will vindicate the rights of the farmers to protect the integrity of their cropland.

Pragmatically, each of the proposed modifications will help to reduce the unintended spread of genetically engineered material in agriculture. Recovery in a common-law suit will give the farmer the money to remediate his land. Being free from the cost of defending a patent infringement suit will also help to ensure that an invaded farmer has the funds to eradicate the GMO from his property.

By adding the element of intent to the relevant patent infringement claim, we will differentiate between the farmers who intentionally obtain the patented seeds without the proper approval of the patentee—who of course deserve no protection and should be subject to patent infringement suits—and those farmers who find themselves inadvertently, by the process of genetic drift, in possession of patented plant material. The latter group, who had neither intent nor desire to possess the GMO plants, will likely want to remediate their land, but will not be able to do so if they are liable to the patentee for the full profits of their farms. Freeing this latter group from liability for infringement and making common-law remedies available to them will put the resources into the hands of those farmers to eradicate the GMO from their property.

IX. Conclusion

The current jurisprudence governing genetic drift creates both legal and policy-based problems, and thus needs substantial reformulation. The *Schmeiser* doctrine ignores the fundamental differences between most pat-

contaminating the non-GM crops; and (6) despite the socially valuable goals of increasing food production and controlling insects, weeds, and other pests without applying pesticides, an "equitable balancing of social interests" would require a GM crop producer to pay the consequences of the production activities that cause damage to neighboring farmers. *Id.*

142. See *supra* subparts VII(A–B).

ents and a patent on a self-propagating plant,¹⁴³ is inequitable,¹⁴⁴ places an inappropriate affirmative duty on the farmer,¹⁴⁵ unfairly disregards the farmer's common-law remedies,¹⁴⁶ and is inconsistent.¹⁴⁷ These legal considerations provide reasons for modification in addition to the policy-based concern that the current jurisprudence results in the spread of genetically engineered products within our agricultural system. Admittedly, the proposed reformations—especially the addition of intent to acquire as an element in a patent infringement claim for this type of patent—represent a substantial change in the legal treatment of the problem of genetic drift. But this type of significant alteration is necessary in light of how little is currently well-understood about the long-term effects of genetically modified organisms in the food supply.¹⁴⁸ The author acknowledges that many of the concerns surrounding GMOs are based only on hypothesis, but many are not.¹⁴⁹ Indeed, if any of the human health concerns come to fruition, the effects could be devastating.¹⁵⁰

While a society as enthusiastic about technology as ours will undoubtedly shy away from an outright ban on GMOs, the myriad concerns surrounding GMOs may justify caution and legal rules designed to minimize the inadvertent spread and domination of GMOs in our food supply. Not only will the proposed reformations curb unintended growth in the market share of GMOs,¹⁵¹ but, perhaps even more importantly, they will help to preserve the genetic integrity of conventional varieties. If as a society, we decide we do not want GMOs in our food supply, or even if we decide we want to have the option of choosing to eat non-genetically engineered foods, it will be critically important to have maintained these conventional strands. Once conventional varieties cross-pollinate with genetically engineered varieties, the two genetic codes cannot be unmixed.¹⁵² Preserving the rights

143. See *supra* subpart VII(B).

144. See *supra* subpart VII(D).

145. See *supra* subpart VII(C).

146. See *supra* subpart VI(B).

147. The inconsistency is most pronounced when the treatment of GMO drift is compared with that of pesticide drift. Consider specifically the court's pronouncement in *Langan v. Valicopters, Inc.*, 567 P.2d 218, 223 (Wash. 1977), where the person who caused the inadvertent spread of pesticides onto a neighboring farm was held strictly liable for the resulting damage. Under *Schmeiser*, not only is the cause of the GMO spread not subject to strict liability for that spread, he is in fact able to recover damages from the invaded farmer.

148. For a pronounced example of how little is known about GMOs, see *supra* note 10.

149. Compare the myriad concerns discussed *supra* in notes 1, 3–11 and accompanying text.

150. Consider the case of transferred allergies, discussed *supra* note 4. In the United States, GMOs permeate our staple crops but are not labeled in any way. Allergic consumers who know the source of their allergy, for instance peanuts or Brazil nuts, are unable to avoid triggering their allergy since proteins from those sources can be transferred, without any warning, to other food products.

151. For discussion on how the market share of GMOs could increase due to genetic drift, see *supra* subpart IV(B).

152. See *supra* subpart IV(A).

of the non-GMO farmer—by strengthening his common-law remedies and adding intent as an element to the relevant patent infringement claims—will allow him to protect those unaltered codes and preserve them for future generations without compromising the legitimate economic interests of the patentee.

Hilary Preston