
COMMENT

Travels with my plant: *Monsanto v. Schmeiser* revisited

Bruce Ziff*

THIS COMMENT EXPLORES THE IMPLICATIONS of the Supreme Court of Canada decision in *Monsanto Inc. v. Schmeiser*, in which the validity of a patent protecting genetically modified plant genes and cells was upheld. Drawing on basic principles of property law and empirical data on the nature of genetically modified foods, the author suggests that the decision may have unforeseen yet far-reaching effects on the ownership of conventional crops that are exposed to genetically modified reproductive materials. Moreover, while the Supreme Court of Canada in *Monsanto* assumed that Parliament could intervene to alter the patent protection for genetically modified plant material, the author argues that the Court has severely overestimated the ability of the federal government to do so, given Canada's obligations under the North American Free Trade Agreement.

CE COMMENTAIRE PORTE SUR LES RÉPERCUSSIONS de la décision de la Cour suprême du Canada dans l'affaire *Monsanto Inc. c. Schmeiser* qui confirme la validité du brevet protégeant les gènes et les cellules de plantes génétiquement modifiés. S'inspirant des principes fondamentaux du droit des biens et des données empiriques sur la nature des aliments génétiquement modifiés, l'auteur suggère que cet arrêt pourrait avoir des conséquences imprévues, mais importantes, sur le droit de propriété des récoltes conventionnelles qui sont exposées à du matériel de reproduction génétiquement modifié. De plus, bien que la Cour suprême du Canada ait présumé dans l'affaire *Monsanto* que le Parlement a la possibilité d'intervenir afin de modifier la protection des brevets sur le matériel végétal génétiquement modifié, l'auteur soutient que la Cour a grandement surestimé la capacité du gouvernement fédéral d'agir de la sorte, étant donnée les obligations du Canada en vertu de l'Accord de libre-échange nord-américain.

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1. INTRODUCTION

SEVERAL YEARS AGO, PERCY SCHMEISER, an elderly farmer from Bruno, Saskatchewan, committed a relatively minor act of patent piracy by sowing Roundup Ready canola seeds without authorization. The incident soon mushroomed, and the dispute at the bottom of *Monsanto Canada Inc. v. Schmeiser*¹ became a *cause célèbre* of the highest order. It has served as a flashpoint in the ongoing political conflict concerning genetically modified foods, the propriety of patenting living organisms, the impact of genetically modified organisms (GMOs) on the environment (the rise of superweeds, etc.), and the plight of small farmers living under the shadow of the giants of agribusiness. These are matters of global significance; accordingly, the progress of the Monsanto-Schmeiser litigation was closely monitored around the world.² Along the way, Percy Schmeiser became a high-profile spokesman for farmers' rights,³ and a "folk hero of the antibiotech forces."⁴

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1. 2004 SCC 34, <http://www.lexum.umontreal.ca/csc-scc/en/pub/2004/vol1/html/2004scr1_0902.html>, [2004] 1 S.C.R. 902, aff'g 2002 FCA 309, <<http://reports.fja.gc.ca/fc/src/shtml/2003/pub/v2/2003fc31227.shtml>>, [2003] 2 F.C. 165, aff'g 2001 FCT 256, <<http://decisions.fct-cf.gc.ca/fct/2001/2001fct256.shtml>>, 202 F.T.R. 78, 12 C.P.R. (4th) 204 [*Monsanto* cited to LexUM/S.C.R.]. Unless otherwise indicated, all references below are to the Supreme Court of Canada decision.
 2. For discussion of *Monsanto* at its various stages, see Carlos Scott López, "Intellectual Property Reform for Genetically Modified Crops: A Legal Imperative" (2004) 20 *Journal of Contemporary Health Law & Policy* 367; Keith Aoki, "Weeds, Seeds & Deeds: Recent Skirmishes in the Seed Wars" (2003) 11 *Cardozo Journal of International & Comparative Law* 247, <<http://www.law.uoregon.edu/faculty/kaoki/site/articles/weedsandseeds.pdf>>; Maria Lee & Robert Burrell, "Liability for the Escape of GM Seeds: Pursuing the 'Victim'?" (2002) 65 *Modern Law Review* 517. For other discussions of the big issues, see e.g. Michael R. Taylor & Jerry Cayford, "American Patent Policy, Biotechnology, and African Agriculture: The Case for Policy Change" (2004) 17 *Harvard Journal of Law & Technology* 321, <<http://jolt.law.harvard.edu/articles/pdf/v17/17HarvJLTech321.pdf>>; Gregory Rose, "International Law of Sustainable Agriculture in the 21st Century: The International Treaty on Plant Genetic Resources for Food and Agriculture" (2003) 15 *Georgetown International Environmental Law Review* 583, <http://www.findarticles.com/p/articles/mi_qa3970/is_200307/ai_n9295438>. There is a seemingly limitless supply of commentary of variable quality on the internet.
 3. See <<http://www.percyschmeiser.com>>.
 4. Peter Pringle, *Food, Inc.: Mendel to Monsanto—he Promises and Perils of the Biotech Harvest* (New York: Simon & Schuster, 2003) at p. 181.

Even more generally, the case is about the rising tide of commodification. The erosion of public spaces takes many forms, such as the expansion of copyright terms, the recognition of a legally enforceable right of publicity, reforms calling for *sui generis* protections for indigenous knowledge and folklore, and the ongoing privatization of state facilities and governmental services. James Boyle describes such episodes as part of a “second enclosure movement.”⁵

In this paper I want to draw on the enclosure metaphor. Enclosure—control over access—is the essence of private property. And just as the first enclosure movement was principally concerned with the privatization of agricultural lands once held as commons, so too are farming practices at the centre of the current controversy. I focus on the problems of creating a viable enclosure in the context of genetically modified and patented crops, using the dispute between Monsanto and Schmeiser as the point of departure. In doing so, I accept *arguendo* that the Supreme Court of Canada correctly interpreted the law as it now stands in order to find: (i) that the Monsanto patent was valid; (ii) that it covered genes and cells even after these are inserted into a plant; and (iii) that the actions of Schmeiser amounted to a breach. My focus is on the problems that are left unaddressed by these holdings.

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2. THE CANOLA DISPUTE IN A NUTSHELL

MONSANTO INC., THE VILLAIN of the piece, is a multinational firm now specializing in biotechnologies used in agriculture. It is the largest of a handful of international conglomerates in this field. Monsanto’s products currently include an array of transgenic seeds, such as a strain of Canola that is resistant to glyphosate-based herbicides such as Roundup (a Monsanto product that is now off-patent). The utility of these seeds is considerable: one can spray canola plants with Roundup, killing weeds and volunteers, while not appreciably harming the cash crop. Weed control prior to planting is rendered unnecessary; as a result, seeds can be sown earlier. Erosion from tillage is reduced; profits are increased.

In 1993, Monsanto obtained a patent that included claims over chimeric (*i.e.*, non-natural and cross-species) genes as well as the cells into which these genes are inserted,⁶ and three years later it began marketing the genetically modified (GM) seeds under the name Roundup Ready canola. Farmers wishing to use the seeds are required to sign an extensive licence agreement, under

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5. James Boyle, “The Second Enclosure Movement and the Construction of the Public Domain” (2003) 66 *Law & Contemporary Problems* 33, <<http://www.law.duke.edu/pd/papers/boyle.pdf>>. See also Peter Drahos & John Braithwaite, *Information Feudalism: Who Owns the Knowledge Economy?* (New York: New Press, 2003). For an unusual exploration of the commodification phenomenon, see Henry M. Abromson, “Comment: The Copyrightability of Sports Celebration Moves: Dance Fever or Just Plain Sick?” (2004) 14 *Marquette Sports Law Journal* 571.
 6. Canadian Patent No.1313830, <http://patents1.ic.gc.ca/details?patent_number=1313830&language=EN>, appended to *Monsanto*, *supra* note 1.

which it is not permissible to retain harvested seeds for replanting.⁷ New seeds must therefore be purchased each year. Canola is a valuable cash crop on the Canadian Prairies, the seeds being used to make cooking oil and animal feed. It is estimated that herbicide resistant canola accounts for 70 percent of that crop now grown in Canada.⁸

Schmeiser was not a Monsanto customer. Quite by chance he discovered what turned out to be Roundup Ready canola growing on the periphery of his land. Once aware of the plants' properties—herbicide did not kill them—he decided to collect and cultivate the seeds. Evidence suggested that almost all of his 1998 canola crop, which covered over 1,000 acres of land, was comprised of Roundup Ready canola. The licensing fee, which Monsanto levies for that quantity of seeds, would be just over CAN\$15,000. Schmeiser's use having been detected, he was sued by Monsanto for breach of patent. The Federal Court found for Monsanto, as did the Court of Appeal and a majority of the Supreme Court of Canada.⁹ The patent was valid; Schmeiser had infringed it.

This result seemed surprising to some. Just eighteen months earlier, the Supreme Court had decided the *Harvard Mouse*¹⁰ case, in which the patentability of a genetically altered mouse (the oncomouse) was at issue. By the same slender margin (5-4) a majority of the Supreme Court held that the patent to the mouse was not tenable.¹¹ More generally, the Court declared that higher life forms were not amenable to patent protection. And—of great importance here—plants were categorized as higher life forms. Even so, the *Harvard Mouse* case was distinguished by the *Monsanto* Court. The Patent Commissioner had refused a patent for the mouse, but had allowed claims for "a plasmid and a somatic cell culture,"¹² which were never contested. The Court treated Monsanto's claims for the plant gene and cell as analogous to these untested patent-rights. Moreover, it was observed that the Court in *Harvard Mouse* had accepted (in *obiter*) that a "fertilized, genetically altered oncomouse egg would be patentable subject matter, regardless of its ultimate anticipated development into a mouse."¹³

7. In addition, the licence requires the harvested crop to be sold only to commercial purchasers licensed by Monsanto.
8. C. Neal Stewart, *Genetically Modified Planet: Environmental Impacts of Genetically Engineered Plants* (New York: Oxford University Press, 2004) at p. 4.
9. The majority decision was written by McLachlin CJ and Fish J, with Major, Binnie and Deschamps JJ concurring. A dissenting opinion was issued by Arbour J, with whom Iacobucci, Bastarache, and LeBel JJ agreed.
10. *Harvard College v. Canada (Commissioner of Patents)*, 2002 SCC 76, <http://www.lexum.umontreal.ca/csc-scc/cgi-bin/disp.pl/en/pub/2002/vol4/html/2002scr4_0045.html>, [2002] 4 S.C.R. 45 [*Harvard Mouse* cited to S.C.R.]. The majority was comprised of L'Heureux-Dubé, Gonthier, Iacobucci, Bastarache and LeBel JJ. The dissenting justices were: McLachlin CJ and Major, Binnie and Arbour JJ. For the record, this means that (i) seven of the nine justices sat on both appeals (Fish and Deschamps JJ had replaced L'Heureux-Dubé and Gonthier JJ); none was on the majority side of both rulings; (ii) one judge was in dissent in both cases (Arbour J); and four of the justices who sat on both cases were in favour of both patent claims, though there were severe differences as to the scope of the rights conferred: McLachlin CJ, Major, Binnie and Arbour JJ). In the dissent in *Monsanto*, Arbour J concluded that the patent was valid for the cells and genes *in the laboratory prior to regeneration*, and as regards the process for making the genetically modified plant: see paras. 107-139 on that view, Mr. Schmeiser had not infringed the patent.
11. *Ibid.*
12. *Monsanto*, *supra* note 1 at para. 22.
13. *Ibid.* at para. 23.

A patent holder obtains time-limited exclusive rights over “making, constructing and using the invention and selling it to others to be used.”¹⁴ The critical finding in this case was that Schmeiser had used the patented cell and gene contrary to the *Patent Act* by collecting and replanting the seeds. Three principles of patent law (as interpreted by the majority) explain that result.

First, wrongful use can occur even when the patented items (such as genes and cells) were inside an object that was not and could not be patented (such as plants). Second, a patent is *used* within the meaning of the Act even if only on an “insurance” or “stand-by” basis. A fire extinguisher is used in that way, even if it is never deployed to suppress a fire. Consequently, it was immaterial whether Schmeiser did in fact spray his standing crops with Roundup, for he could have done so if necessary. Third, as a general rule, an intention to use a patented invention need not be shown. An exception exists in the case of stand-by use. One cannot sensibly be said to be using a patent as insurance unless one knows that it has the capacity to be pressed into service. But Schmeiser knew of the properties of the seeds. Accordingly, his stand-by use was actionable.¹⁵

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3. COMMENTARY

3.1. *The Focus*

GRANTING A PATENT here inevitably opens the door to a very long list of similar claims. The industry players are engaged in stiff competition for market share, and patents invariably form a key element of their business plans. Monsanto’s Roundup Ready canola patent itself contains claims over the creation of glyphosate-resistant cells for tomatoes, tobacco, flax, soybeans, sunflowers, sugar beets, alfalfa, and cotton.¹⁶ In addition, biotech firms have patented genes for staple crops such as corn, wheat, rice, potatoes, as well as for ornamental grasses. The modified traits affected by the patents extend far beyond resistance to herbicides and include crops that express proteins that serve as pesticides, designer genes that enhance or retard growth, or in various ways alter the quality and quantity of food. Some GM crops are being cultivated to serve medicinal ends (neutraceuticals).¹⁷ These developments have occurred amid intense public debates: are we improving cultivation to feed a starving planet or poisoning

14. *Patent Act*, R.S.C. 1985, c. P-4, <<http://laws.justice.gc.ca/en/P-4?91746.html>>, s. 42. For claims filed before 1 October 1989 (including Monsanto’s Roundup Ready claims), the term is 17 years from the date of issue. After that date, the period is 20 years from the time of filing: ss. 44, 45(1).

15. See generally *Monsanto*, *supra* note 1 at paras. 28-87. Also, Schmeiser was in a position to sell the seeds to others (para. 85). Monsanto sought an order disgorging the Schmeiser’s profits arising from his use of Roundup Ready canola. As there was no evidence to suggest that Schmeiser obtained any additional profit by virtue of using that product, damages were set at zero. Had Monsanto sought an award based on its losses (which it did not), the Court could have considered the effect of Schmeiser’s breach on lost sales and royalties. See paras. 98-105.

16. Canadian Patent No. 1313830, *supra* note 6 at claims 43-51. A search for the word “canola” in the Canadian Patent Office yielded references to 679 claims.

17. See generally Stephen Nottingham, *Eat Your Genes: How Genetically Modified Food is Entering Our Diet 2* (New York: Zed Books Ltd., 2003). See also Pringle *supra* note 4.

ourselves and our children, while damaging fragile ecosystems? Are we enabling corporate giants to gain oligopolistic control over the earth's food supply at the expense of small producers, who will be consigned to a life of bioserfdom? Ruling in the shadow of these meta-issues, it is not at all surprising that the Supreme Court chose to tread softly. The following propositions found in the judgment share the common aim of seeking to confine (enclose) the scope of the holding:

Everyone agrees that Monsanto did not claim protection for the genetically modified plant itself, but rather for the genes and the modified cells that make up the plant.¹⁸

In reaching [our] conclusion, we emphasize from the outset that we are not concerned here with the innocent discovery by farmers of "blow-by" patented plants on their land or in their cultivated fields.¹⁹

[I]f Parliament wishes to respond legislatively to biotechnology inventions concerning plants, it is free to do so. Thus far it has not chosen to do so.²⁰

My thesis is that despite this ultra-cautious approach, the Supreme Court of Canada judgment severely underplays the implications of its holding for both farmers and government. I will contend that the ruling deeply affects both plant ownership and the position of innocent farmers. Furthermore, a parliamentary response has been rendered problematic *by virtue of the holding*. If limits on the scope of the rights recognised in *Monsanto* exist, they must be found elsewhere.

Explaining my position requires an appreciation of the means by which canola plants (by way of example) breed and how the law accommodates these processes. In other words, in order to understand the changes that have been introduced, one needs to consider the "laws of nature" in two different connotations of that phrase.

3.2. *The Laws of Nature*

Pollen contains the genetic codes of the donor plant. Canola is capable of both self- and cross-pollination. Self-pollination is common, but it has been estimated that cross-pollination occurs at a rate of 12 percent to 47 percent²¹ (though it has also been suggested that the rate is between 20 percent and 30 percent).²² The variables that influence this propensity are weather, the nature of neighbouring cultivars, and the presence of insect pollinators. Pollen from one canola plant

18. *Supra* note 1 at para. 17.

19. *ibid.* at para. 2.

20. *Ibid.* at para. 95. The majority also emphasized that they were steering clear of the debate about the wisdom of the turn to genetically modified foods. See paras. 2-3 and 93-95.

21. Office of the Gene Terminology Regulator, "The Biology and Ecology of Canola (*Brassica Napus*)" (2002), <<http://www.non-gm-farmers.com/documents/brassicaOGTR.pdf>> at pp. 5-6 [Gene Terminology].

22. Phil Thomas, "Outcrossing Between Canola Varieties—A Volunteer Canola Control Issue," <[http://www1.agric.gov.ab.ca/\\$department/deptdocs.nsf/all/crop1300](http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/crop1300)>.

migrates to another either by wind or via birds or insects (usually bees). Airborne Canola pollen normally migrates only short distances (10 metres or so), but can travel more than a kilometre downwind. Likewise, bee-induced pollination tends to result in a limited range of migration. Bees tend to forage close to their hives, choosing one kind of plant per foray. In agricultural settings they can normally acquire sufficient food to meet their needs within a single crop field. Occasionally, however, the migration distances are significant, ranging as high as four kilometres.²³

The seeds that germinate will contain genetic material from both the donor and recipient plants, and those seeds may themselves migrate in various ways.²⁴ Canola seeds are lightweight and can easily become airborne. As the commercial value of the plant is reposed in the seeds, most are harvested. However, there is inevitably some residual spillage in the harvesting or transportation of the crop. Canola seeds have been found to subsist for up to 10 years in undisturbed soils.²⁵ Moreover, a Canadian research paper suggests that Roundup Ready canola seeds used as chicken feed and spread within manure remained viable one year later.²⁶

The movement of pollen can lead to the merging of genetic materials among different strains of sexually compatible canola. On the Canadian Prairies there are at least six varieties of cultivated canola, and any one of these varieties can outcross with the others.²⁷ In rare cases, genetic transfer to other plant species can also occur.²⁸

While there is a great potential for genetic transfer through natural forces, there is still considerable uncertainty about the interaction between GM and non-GM crops. The scientific and health effects are also unclear. For instance, canola plants designed for human consumption can cross-pollinate with related plants that are used to produce commercial lubricants without identifiable health effects transpiring.²⁹ In addition, some estimates suggest that less than 1% of a given crop is likely to be affected in an appreciable (and sometimes beneficial) way.³⁰ Outcrossing is not a new concern in agriculture, and farming techniques can be used to minimize occurrences.³¹ Nevertheless, a recent published study of genetically modified grass, for use on golf courses,

23. Gene Terminology, *supra* note 21 at p. 8.

24. *Ibid.* at pp. 21-22.

25. *Ibid.* at p. 25. For seeds in disturbed soils, the period is about five years.

26. *Ibid.* at p. 22 citing G. Martens, "From Cinderella to Cruella: Volunteer Canola" (Paper presented at the University of Manitoba 2nd Annual Agronomists Conference, 2001) [unpublished].

27. *Ibid.* at note 21. The varieties are: (i) conventional canola; (ii) specialty fatty acid varieties (such as high erucic acid or low linolenic acid); (iii) Navigator/Compas (bromoxynil tolerant); (iv) Liberty Link (glufosinate ammonium tolerant); (v) Roundup Ready (glyphosate tolerant); and (vi) SMART canola (tolerant to some ALS inhibitors).

28. Thomas, *supra* note 22 at p. 20. The process of transfer is called "bridging."

29. Andrew Pollack, "Can Biotech Crops Be Good Neighbors?" *New York Times* (26 September 2004), <<http://www.globalpolicy.org/soecon/trade/gmos/2004/0926biotechcrops.htm>>.

30. See further Drew L. Kershen, "Of Straying Crops and Patent Rights" (2004) 43 *Washburn Law Journal* 575 <<http://washburnlaw.edu/wlj/43-3/articles/kers.pdf>> at p. 579; Norman Siebrasse, "The Innocent Bystander Problem in Patenting Higher Life Forms" (2004) 49 *McGill Law Journal* 349, <<http://www.journal.law.mcgill.ca/aba/vol49/2siebr.html>> at pp. 367-68.

31. See further Kershen, *ibid.*

found that cross-pollination with plants of the same species occurred from a distance of 20 kilometres away. Wild grass of a different species was pollinated by GM-grass located 14 kilometres downwind.³² A *New York Times* editorial offered that these results “virtually demand[] a careful reassessment of how such plants are regulated.”³³

The ebb and flow of plant material has legal implications. To take a straightforward case, where the branches of a tree growing on *Lot A* intrude onto *Lot B*, any fruit on those branches remains the property of the owner of *Lot A*,³⁴ even through the intrusion is actionable as a nuisance.³⁵ Title to the fruit is not lost if that fruit should in due course fall onto *Lot B*; in general, personal property rights are not that precarious. Yet, if soil were to blow from *Lot A* to *Lot B* it would be both counter-intuitive and complicated if the owner of *Lot A* retained any rights. Soil, like water, gas, and petroleum, is a fugacious substance, and when it migrates in the course of nature, title may thereby be lost. The same result would obtain when seeds and pollen are scattered hither and yon by wind or animals.³⁶

3.3. The Impact of the Ruling

These principles govern the physical matter of the first-generation seeds that made their way onto Schmeiser’s land. Every Roundup Ready seed has the special genes and cells inside of it; and these too became Schmeiser’s in some sense. I say “in some sense” because at the same time Monsanto’s rights are not lost; they endure. This, then, is the first change in the law of property emerging from the *Monsanto* case. On a blustery Prairie day, title to thousands of seeds, specks of pollen, and grains of soil are transferred among landowners. However, some rights, such as patents, are impervious to those forces. They are, one might say, common-law resistant.

A second change in the law results from the ruling. Imagine that a single speck of Roundup Ready pollen fertilizes a canola plant owned by Schmeiser. A fertile seed is produced which is planted the following spring. Who owns that new plant? In general, where the goods of two owners become inseparably joined, an accession results. Similarly, a natural accession arises in the case of natural offspring. In either instance, the law determines to whom the object belongs. Almost always the legal solution is to confer title on one contributing

32. Heather G. Davis *et al.*, “Pollen Limitation Causes an Allee Effect in a Wind-Pollinated Invasive Grass (*Spartina alterniflora*)” (2004) 101 Proceedings of the National Academy of Sciences 13804, <<http://www.pnas.org/cgi/content/short/101/38/13804>>. That article is discussed in Andrew Pollack, “Genes From Engineered Grass Spread for Miles, Study Finds” *New York Times* (21 September 2004), <<http://artsci.wustl.edu/~anthro/bnc/21grass.html>>.

33. Editorial, “The Travels of a Bioengineered Gene” *New York Times* (30 September 2004), <<http://www.thecampaign.org/News/sept04o.php>>. But *cf.* Stewart, *supra* note 8.

34. *Mills v. Brooker*, [1919] 1 K.B. 555 at p. 558.

35. *Lemmon v. Webb*, [1895] A.C. 1 (UK HL).

36. As logical as this outcome seems to be, there is little authority to support it. An accordant view was taken in the trial judgment in *Monsanto*, *supra* note 1 at para. 92. See also *Bremner v. Bleakley* (1923), 54 O.L.R. 233, [1924] 2 D.L.R. 202 (SC (AD)) where it was held that accretion to land can occur through the force of wind, and the soil deposited belongs to the owner of the receiving property.

party (though the other may be entitled to some form of compensation). Hence, in the case of a natural accession the general rule is that the owner of the mare owns the offspring.³⁷ An exception is recognised for swans; the cygnets are divided between the owners of the cock and hen.³⁸

Accession doctrines emerged to resolve contests involving two or more owners of tangible personal property (choses in possession). But it can also affect intangibles (choses in action). Take for example, a case of copyright infringement: A prints 10,000 copies of a book, the copyright over which is owned by the author, B. The ink and paper that belong to A have, in a manner of speaking, been combined with B's intellectual property. There is no doubt that an infringement has occurred, but who owns the books? The *Copyright Act*³⁹ provides that the copyright-holder may obtain possession of these goods. But, on application by the defendant a court may order that the goods be destroyed, or grant such other order as it considers appropriate. When considering destruction or some alternative response, a court must consider whether severability is possible, and "the proportion, importance and value of the infringing copy or plate, as compared to the substrate or carrier embodying it."⁴⁰

Curiously, the *Patent Act* contains no comparable provision. However, there is an application—analogue or possibly direct—of the general rules of accession that apply whenever the patent is manifested by some physical entity, i.e., the invention. Assume A holds a patent over a widget, and that one of A's widgets (the physical item) becomes mistakenly and irretrievably welded to B's far-more-important-and-expensive machine. In this case, it is likely that title to that very widget has disappeared, and that B now in effect holds title to the physical item. I am aware of no case that deals with this particular problem, though it might seem at first glance to be a common one. I suspect that the issue has not arisen because most permanent affixing is likely the result of a knowing act by the patent violator. In that instance, the patent holder would likely, as the cases now stand, be awarded the item.⁴¹ However, if a microscopic invention composed of physical matter is contained—innocently but inseparably—inside a plant, it is probable that a court would hold that the genetic machine accedes to the plant and not *vice versa*.⁴²

37. See *Calhoun v. Reid* (1927), 22 Sask. L. R. 45, 3 W.W.R. 429 (CA); *Wallace v. Scott* (1907), 16 Man. R. 594, 5 W.L.R. 341 (*sub nom.* *Roper v. Scott* (1907), 16 Man. R. 594) (CA); *Dillaree v. Doyle* (1878), 43 U.C.Q.B. 442; *Temple v. Nicholson* (1881), Cass. S.C. Dig. 116 (SCC). Comparable reasoning could be achieved by treating the case as one of alteration (*specificatio*), under which title to goods may be lost by their physical transformation produced by the labour of another. See generally Bruce Ziff, *Principles of Property Law*, 3d ed. (Toronto: Carswell, 2000) at pp. 111-18.

38. *Case of Swans* (1592), 7 Co. Rep. 15b, <http://oll.libertyfund.org/Texts/LFBooks/Coke0074/PDFs/0462-01_Pt07_Reports7.pdf>, 77 E.R. 435 (KB).

39. R.S.C. 1985, c. C-42, <<http://laws.justice.gc.ca/en/C-42/text.html>>, s. 38(1).

40. *Ibid.*, as am. by S.C. 1997 C-24, s. 38(4)(a).

41. See e.g. *Silsbury v. McCoon*, 3 N.Y. 379 (1850), 53 Am. Dec. 307 (holding that whiskey made from stolen corn belonged to the owner of the corn).

42. I am assuming, however, that the law governing fugacious substances has not resolved the question of title *ex ante*.

Counsel for Schmeiser argued that the law of natural accession was germane, and that Schmeiser stood in the position of the owner of a mare that had become impregnated by a stray bull belonging to another. That line of reasoning was (tersely) rejected, because "the issue is not property rights, but patent protection. Ownership is no defence to a breach of the *Patent Act*."⁴³ That response is inelegant: patent rights *are* property rights, so contrasting the two is confusing. Moving beyond the poor prose, the statement tries to identify a cornerstone of patent law. A is entitled to go to Canadian Tire and buy all of the parts necessary to build a new kind of widget that was invented and patented by B. But A, despite owning all of the parts, cannot lawfully build the widget. In that sense, the Supreme Court is surely correct: ownership is no defence to a patent violation.

However, that ruling also produces a new accession rule. Its closest counterpart is the special rule applied to swans, though the rights granted here are asymmetrical not equal. The functional and legal upshot is to confer shared ownership by virtue of the inseparable integration of tangible and intangible property. The infusion of every seed or speck of pollen into the crops of someone else renders Monsanto a co-owner of every plant thereby affected.

Let me explain the nature of Monsanto's co-ownership. It is common to think of property not as a thing, but as a collection or bundle of rights. These rights confer a monopoly power over the use of some commodity. In this conceptualization we tend to focus on three things: the holder of the rights, the object, and those others who must respect the property entitlement. So, if I own a vase, then *you* cannot convert it. However, there is another element that is built into this basic understanding: my property rights constrict not only what can be done to my property; they also confer on me rights over *your* things. You cannot use your property to damage mine unless of course I permit it.

This extra element is especially material in relation to patents. Recall the Canadian Tire example: though I can buy all of the parts needed to make a widget, the patent-holder has control over some of their uses. Control is really shared, for before a widget can be constructed with these items both "owners" must agree. Why is it not correct to say that both have enforceable property rights over the widget components?

To treat A as a kind of co-owner of B's goods is often unhelpful, even if true in the functional sense suggested here. Normally, there are myriad uses that do not engage the veto power of patent holders or others. The widget components in my hypothetical might be amenable to dozens of alternative lawful uses. But what if an item is less versatile, as is the case for canola seeds? Imagine a farmer who finds that the canola crop has been invaded by Roundup Ready genes. Those seeds now belong to that farmer, but the patent still exists and so the right of use is now placed in the hands of both the farmer and Monsanto. What is more, it is impossible to purge the gene, and ergo the patent-rights, from the plant. The farmer now has a limited range of legal choices: use the seeds to build a lamp base, seek consent from Monsanto, or sell the seeds

43. *Monsanto*, *supra* note 1 at para. 96.

as a cash crop. Unilaterally using the plants to produce next year's crop is no longer a valid option, even though the farmer otherwise owns the plants, and has in all likelihood expended considerable time and money in the course of growing them.

Notice here that I have stopped talking about ownership of the genes and cells, and am now referring simply to the plants. In distinguishing *Harvard Mouse*, the majority in *Monsanto* stressed that it is the gene and cell that are patentable, not the plant *per se*. However, the distinction is specious, a point recognised in the dissenting opinion.⁴⁴ The patented gene is part of every cell of the host plant, and therefore, the infusion of the gene confers, in substance, the right to control use (to exclude or include) on the patent-holder. If that is so, then despite what the majority judgment states, the owner of the gene owns a critical stick in the bundle of rights, one that affects every fibre of the plant. To put it in more concrete terms, not only is Percy Schmeiser precluded from replanting seeds, he cannot use cuttings for that purpose either.

The theoretical implications abound. Recall that there are already other comparable patents in place, with more on the way. To name only a few, currently on the market is a GM corn variety that expresses a protein that is resistant to the European corn borer, a common and pernicious pest. In early October 2004, Monsanto announced that it will market low-linolenic soybean seeds that produce a healthy alternative to trans-fats.⁴⁵ Remember also that, except for stand-by use, intention is not a prerequisite to the finding of a patent violation. Note finally that the uses of the two GM crops described in this paragraph are active not stand-by. These are active uses because the traits introduced by the genetic innovations are actually and continuously at work. They can be contrasted with the stand-by use of Roundup Ready canola in the same way that a smoke detector, which is constantly monitoring the air, can be contrasted with the stand-by use of a fire extinguisher. Even in the case, say, of a frost-resistant GM plant, the use of that property becomes active when an otherwise damaging frost occurs. Unless a discrete patent defence is allowed for such situations, the property rights of otherwise innocent farmers can be affected by blow-by reception of certain types of patented genetic material.

The presence of several trait-enhancing patents can create a further imbrication of rights. Firms such as Monsanto now "stack" patented genes into a single seed product. Moreover, when all of these gene-gizmos are swirling in the air, with multiple patent-holders, there may in time be multiple owners of a given seed, all holding a use-veto. For instance, there are now three herbicide-resistant canola varieties farmed in Western Canada, each resistant to a fundamentally different kind of chemical.⁴⁶ The result of a physical combination is what is now called a tragedy of the anticommons, or, in this context, a patent

44. *Ibid.* at paras. 108 and especially 138.

45. "Cargill-Monsanto introduce trans-fat alternative" *Bakery and Snacks* (6 October 2004), <<http://www.bakeryandsnacks.com/news/news-NG.asp?n=55225>>.

46. In addition to Monsanto Roundup Ready canola, there is Bayer's Liberty Link which is resistant to glufosinate, as well as plants that are bred from tissue culture to be imadizoninione-resistant: Nottingham, *supra* note 17 at xvii.

thicket. In other words, property rights over an object can become so fractured that assembling the needed bits is plagued by holdout problems.⁴⁷ Use of the good may therefore be severely impeded.

Let me recap. The holding in *Monsanto* works to alter the rules that govern the natural migration of fugacious goods. Loss of possession does not destroy the intellectual property associated with those goods. Moreover, a patented gene that exists in every cell of a plant confers a limited form of property right over the entire plant. Such plants may be composed partly of patented genes belonging to one or more holders, all of who become functional co-owners, with vetoes over use. And innocent farmers beware: some of these genetic-patent infringements can occur even though one is unaware that one is using the invention.

The kind of legal fall-out from *Monsanto* described above is only a small part of the picture. There are various scientific and economic concerns associated with genetic patenting, and taken collectively, these may prompt a reconsideration of the wisdom of the holding in the case. The Supreme Court acknowledges that Parliament is free to do so.

Before the enactment of the *Canadian Charter of Rights and Freedoms*,⁴⁸ such statements of judicial deference served as a nod to the doctrine of Parliamentary supremacy. In the post-*Charter* era it serves as recognition of the ongoing dialogue between courts and legislatures.⁴⁹ Its invocation here seems apt because, quite deliberately, there is no explicit constitutional protection of property in the *Charter*. The *Canadian Bill of Rights*⁵⁰ does contain a property protection, although it has proven to be astonishingly weak. If, for example, you are Joseph Authorson, a decorated World War II veteran whose pension and disability payments were mismanaged for decades by the federal government, the guarantee is empty. Authorson unsuccessfully claimed that the *Bill of Rights* protection of property invalidated a statutory bar that insulated the federal government from liability for those very acts of maladministration.⁵¹

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47. See Michael A. Heller & Rebecca S. Eisenberg, "Can Patents Deter Innovation? The Anticommons in Biomedical Research" (1998) 280 *Science* 698, <<http://www.sciencemag.org/cgi/reprint/280/5364/698.pdf>>. See also H. Hamme Ramirez, "Defending the Privatization of Research Tools: An Examination of the 'Tragedy of the Anticommons' in Biotechnology Research and Development" (2004) 53 *Emory Law Journal* 359. Cf Ronald J. Mann, "The Myth of the Software Patent Thicket: An Empirical Investigation of the Relationship Between Intellectual Property and Innovation in Software Firms" (February 2004) University of Texas Law and Economics Research Paper No. 022, <http://papers.ssrn.com/sol3/papers.cfm?abstract_id=510103>.
48. Part I of the *Constitution Act, 1982*, being Schedule B to the *Canada Act 1982* (UK), 1982 c. 11, <<http://laws.justice.gc.ca/en/charter/index.html>>.
49. See e.g. *R. v. Mills*, [1999] 3 S.C.R. 668, <http://www.lexum.umontreal.ca/csc-scc/en/pub/1999/vol3/html/1999scr3_0668.html>, 180 D.L.R. (4th) 1 at para. 56. See also Kent Roach, *The Supreme Court on Trial: Judicial Activism or Democratic Dialogue* (Toronto: Irwin Law, 2001).
50. S.C. 1960, c. 44, <<http://laws.justice.gc.ca/en/c-12.3/28981.html>>, s. 1(a) [*Bill of Rights*].
51. *Authorson v. Canada (Attorney General)*, 2003 SCC 39, <http://www.lexum.umontreal.ca/csc-scc/en/pub/2003/vol2/html/2003scr2_0040.html>, [2003] 2 S.C.R. 40. All is not lost for the veterans who brought this class action. Following the Supreme Court of Canada decision, a motion was brought before the trial judge, Brockenshire J, in which it was argued that all rights to compensation had not been foreclosed by section 5.1(4) of the *Department of Veterans Affairs Act*, R.S.C. 1985, c. V-1, <<http://laws.justice.gc.ca/en/v-1/49143.html>>. That argument succeeded: see *Authorson (Litigation Guardian of) v. Canada (Attorney General)*, (2003), 235 D.L.R. (4th) 506, <<http://www.canlii.org/on/cas/onsc/2003/2003onsc12077.html>> (S.C.).

However, if you are Monsanto, different rules apply: NAFTA governs. Under article 1110 of NAFTA, foreign investors from the signatory states are protected against both direct and regulatory takings.⁵² Legislation that terminates ongoing patents such as the one for Roundup Ready canola probably triggers a right of compensation in favour of Monsanto, a foreign investor.⁵³ So, it is true that Parliament is free—as in *libre*—to reverse the Supreme Court of Canada ruling tomorrow. Such legislation would be unimpeachable. Nonetheless, it might not be free—as in *gratis*—since deprived patent-holders could well be entitled to the market value of the lost years of the patent protection. Given all of the existing claims, this could amount to recovery in the billions of dollars. It is sadly ironic, then, that the avenue that the majority claimed remained open, that is, a robust political reassessment is the one element that, for all practical purposes, has been foreclosed.

Federal liability could be avoided if parliamentary action was framed to be prospective only, leaving current patents, of untold number, to run their course. In any event, the quantum of a NAFTA award could be reduced by transforming the patent into rights conferred under the *Plant Breeders' Rights Act* (PBRA).⁵⁴ Indeed, the Roundup Ready gene is amenable to protection under that Act. Rights under the plant breeders legislation are more limited than those for patents. The key entitlement is the exclusive right to sell and produce propagating material (for propagation purposes) of a plant variety.⁵⁵ Retaining seeds year-to-year for replanting, the approach taken by Percy Schmeiser, does not violate the PBRA.⁵⁶ In other words, monetary losses occasioned by the abolition of seed patents would be mitigated by the presence of this seed-specific regime.

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4. CONCLUSION: ENCLOSING THE FIELD

IN RECENT YEARS, concerns about the potential health and ecological risks of genetically modified foods have grown. I see the *Monsanto v. Schmeiser* dispute as an allegorical tale of the fears over the yet-unknown consequences of the genetic revolution. The long-term *legal* consequences may adversely affect not just farmers, but also the major biotechnical producers themselves. Even though

52. North American Free Trade Agreement, 17 December 1992, Can.T.S. 1994 no. 2, <http://www.nafta-sec-alena.org/DefaultSite/index_e.aspx?DetailID=78>, 32 I.L.M. 289 (entered into force 1 January 1994). In particular, art. 1110(1) provides as follows: "No Party may directly or indirectly nationalize or expropriate an investment of an investor of another Party in its territory or take a measure tantamount to nationalization or expropriation of such an investment ("expropriation"), except: (a) for a public purpose; (b) on a non-discriminatory basis; (c) in accordance with due process of law and art. 1105(1); and (d) on payment of compensation" See further, Bruce Ziff, "Taking Liberties: Protections for Private Property in Canada" in Elizabeth Cooke, ed., *Modern Studies in Property Law* (Oxford: Hart, 2005) 341.

53. The parent company, headquarters for which are in St. Louis, Missouri, owns the patent; Monsanto Canada is a licensee.

54. R.S.C. 1990 c. 20, <<http://laws.justice.gc.ca/en/p-14.6/94462.html>> [PBRA].

55. *Ibid.*, s. 5. The term is 18 years (s. 6).

56. Of course, protecting the seeds under the plant-breeder regime would be wrong if the rationale for change in the law is at all connected to health concerns.

Monsanto successfully defended its patent, and even though it may acquire title to plants wherever its genetic material happens to lead to breeding, the news is not all good; far from it. The rights it and other firms acquire through natural serendipity may not only be unprofitable but possibly quite detrimental.

There are at least three reasons why Monsanto should desire enclosure. First, physical enclosure is valuable because intellectual property protections are often ineffective on their own: Exhibit "A" is the stream of copyright violations perpetrated daily on the internet. In a similar vein, homeowners do not typically count solely on the law of trespass to protect their property; fences, locks, and alarms are generally more efficacious. Enclosing patented goods provides protection far beyond that which the law can confer on paper.

Second, fugacious genes may give rise to civil liability for manufacturers and their customers (which, needless to say, would cause future seed sales to plummet). These concerns are not hypothetical: in early 2002, organic farmers in Saskatchewan commenced a class action against Monsanto and Aventis (now Bayer), claiming that the insinuation of GM material into crops that are (otherwise) certifiable as organic is actionable. Several causes of action are advanced in the suit: negligence, breach of statutory duty, private nuisance, trespass, and strict liability (based on the rule in *Rylands v. Fletcher*).⁵⁷ In a careful review of the applicable tort principles, Jane Matthews Glenn has suggested that the most promising bases of liability against the manufacturers lay in breach of statutory duty (regarding appropriate provincial environmental assessment and approval) and negligence (arising from defective product design). However, she recognises that both factual and doctrinal uncertainties make firm predictions unwise.⁵⁸

Finally, it is hardly worthwhile for the company to exercise its rights when minor transgressions occur. Only for significant incidents (*à la* Percy Schmeiser) would it make sense for the patentee to assert its rights. In sum, Monsanto loses little by inhibiting gene wandering.

As mentioned briefly above, there are conventional methods for limiting outcrossing and the spread of seeds and genes.⁵⁹ There may also be a novel scientific solution to the internalization problem: the development of a gene that produces sterile seeds. Such a seed will produce an arable plant, however, the seed from that cultivar will be incapable of germinating; it will not be possible to save the seeds for replanting the following season. Its only use, say, in the

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57. *Hoffman et al. v. Monsanto et al.*, Statement of Claim filed 10 January 2002. The amended statement of claim is available at: <<http://www.saskorganic.com/oapf/pdf/amended-claim.pdf>>. The lawsuit has not yet been certified as a tenable class action. For related proceedings, see *Hoffman v. Monsanto Canada Inc.*, 2003 SKQB 174, <<http://www.lawsociety.sk.ca/newlook/Library/fulltextnew.htm>> [access number QB03152], 4 W.W.R. 632; *Hoffman v. Monsanto Canada Inc.*, 2002 SKCA 86, <<http://www.lawsociety.sk.ca/newlook/Library/fulltextnew.htm>> [access number CA02086], 223 Sask. R. 232 (in Chambers); *Hoffman v. Monsanto Canada Inc.*, 2002 SKCA 120, <<http://www.lawsociety.sk.ca/newlook/Library/fulltextnew.htm>> [access number CA02120], 220 D.L.R. (4th) 542. And Louise Schmeiser, wife of Percy, has sued Monsanto for CAN\$140, owing to the presence of Roundup Ready canola in her organic garden: <<http://www.percyschmeiser.com/Wife.htm>>.
58. Jane Matthews Glenn, "Footloose: Civil Responsibility for GMO Gene Wandering in Canada" (2004) 43 *Washburn Law Journal* 547, <<http://washburnlaw.edu/wlj/43-3/articles/glen.pdf>>.
59. *Supra* note 31. See also Thomas, *supra* note 22, and Downey & Beckie, *supra* note 31.

context of canola, is as a harvested crop. Biotech firms describe these as a form of Genetic Use Restriction Technology or GURT. Opponents have dubbed them “terminator” or “suicide” seeds.⁶⁰

That technology is not adverted to in the *Schmeiser* litigation. The central problem in the dispute was that the Roundup Ready seeds were capable of indefinite propagation. And that is why a central term of Monsanto’s licence agreement is that the replanting of harvested (i.e., farmer-grown) seeds is not permissible, however scientifically feasible it might be. By the time the case was before the court, work on GURT technology was well underway. The original American patent for terminator seeds was issued jointly in 1998 to Delta & Pine Land Co. and the United States Department of Agriculture.⁶¹ A Canadian patent has been sought, but has not yet been issued.⁶²

So far, Monsanto has refrained from the commercial use of terminator seeds. Indeed in 1999, it pledged that it would not do so, bowing, it seems, to political pressure.⁶³ It remains uncertain as to whether it will maintain this self-imposed moratorium.⁶⁴ Delta & Pine Land Co. is, to date, the only biotech firm with plans to market terminator seeds, and only for cotton. Importantly, it is not certain that the sterility trait cannot pass on to other plants by natural dissemination of pollen. In a paper prepared to promote the advantages of terminator seeds, this possibility is described as remote.⁶⁵ The reason for some, albeit minimal, equivocation in this statement arises because a plant with a sterile seed can nonetheless produce fertile pollen, and that pollen can carry the sterility trait. In other words, unless the female and male reproductive capacities of a plant are both neutralized, there remains a chance of the horizontal transfer of the sterile trait. The potential detrimental consequences for adjacent farms would be the development of a second-generation terminator product incorporating male sterility.⁶⁶

60. See further Cullen N. Pendleton, “The Peculiar Case of ‘Terminator’ Technology: Agricultural Biotechnology and Intellectual Property Protection at the Crossroads of the Third Green Revolution” (2004) 23 *Biotechnology Law Report* 1, <<http://www.liebertonline.com/doi/pdf/10.1089/073003104322838222>>.

61. *Ibid.* at p. 6.

62. Patent Application No. CA 2196410, <http://patents1.ic.gc.ca/details?patent_number=2196410&language=EN>.

63. For example, the ETC Group (formerly RAFI) has been vigorous in its opposition. It describes terminator technology as “a threat to food security, food sovereignty and Farmers’ Rights.” “Terminator Technology—Five Years Later” ETC Group Communiqué, Issue Number 79 (May/June 2003), <<http://www.etcgroup.org/documents/TermCom03.pdf>>.

64. ETC Group, News Release, “Broken Promises? Monsanto Promotes Terminator Seeds” (23 April 2003), <<http://www.etcgroup/article.asp?newsid=394>>.

65. “Positive environmental impact is another probable positive result of the introduction of GURTs. It is believed that in the improbable event of transgenes in GURT crop plants escaping, through pollen, to related wild species, the resulting seed from these pollinations will not express their new trait or will be unable to form a viable seed, thus preventing the possibility of undesirable gene flow. The utilization of GURTs could also prevent the expression of the new trait in volunteer seeds or even the sprouting of volunteer seed varieties carrying transgenes, thus preventing the spread of these transgenic plants as ‘weeds’ in subsequent crops.” Harry B. Collins & Roger W. Krueger, “The Potential Impact of GURTs on Smallholder Farmers, Indigenous & Local Communities and Farmers Rights: The Benefits of GURTs”, <http://www.etcgroup.org/documents/collins_kruegerISF.pdf> at pp. 3-4. Collins and Krueger are employees of Delta Pine & Land and Monsanto, respectively.

66. Pendleton, *supra* note 60 at note 5.

There are other forms of GURT that are not based on inducing sterilization. Patents exist for seeds containing traits that do not switch on until triggered by the application of a specific chemical. In other words, such "traitor" seeds are capable of reproducing in a normal fashion, but awakening their special property requires a magic potion. In theory, therefore, while the modified seeds can spread, the threat of harm to adjacent crops is minimized.⁶⁷ Similarly, seeds have been created that can expunge the added genetic material prior to the production of seeds and pollen if the plants are properly treated at the appropriate time. These have been labelled "exorcist seeds."

These new technologies may in time render the legal problem of enclosure less acute, though it must be appreciated that (i) there are already countless GMOs loose in the environment; and (ii) health issues are not resolved by the use of GURTs. The move to GURTs recognises the inherent limits of the right of exclusion that the law of property is supposed to endow upon owners. The use of devices such as terminator seeds allows for the internalization of positive externalities or public goods. They are necessary because the hedges that the Supreme Court of Canada constructs to confine the scope of its ruling fail to do their work.

In the end, then, enclosure may be achieved. It is one of the most commonplace tropes of post-enlightenment times to imagine science as the engine of progress.⁶⁸ Even the briefest visit to the Monsanto web site shows how they trade heavily on that ideology for political and investment backing.⁶⁹ It should therefore not be startling to discover that biotech firms look to science to solve the problems that science itself generates, especially given the limits of the law's capacity to construct an effective and principled response.

67. On the other side of the ledger, access to the triggering chemical becomes an added concern to the patentholder.

68. And patents are integral to the Western ethos of progress: see e.g. art. 1, s. 8, cl. 8 (the "Progress Clause") of the United States Constitution: Congress has the power "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries," <http://www.archives.gov/national_archives_experience/charters/constitution_transcript.html>.

69. <<http://www.monsanto.com>>. On the last date of visit, 30 September 2004, there was no apparent reference whatsoever to GURTs.