# SCHMEISER V. BOWMAN: A COMPARATIVE ANALYSIS OF THE DECISIONS, PATENT AND ANTITRUST PRINCIPLES OF INNOVATION, AND PROPOSALS OF PATENT EXHAUSTION IN SELF-REPLICATING TECHNOLOGIES

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## I. INTRODUCTION

"Biotechnology is the application of scientific techniques" and procedures to modify and improve animals, plants, medicine, and microorganisms for the purpose of increasing their overall value.[1] "Farmers have been improving wild plants and animals through the selection and breeding of desirable characteris-

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1. ANIA WIECZOREK, DEP'T OF TROPICAL PLANT AND SOIL SCI., USE OF BIOTECHNOLOGY IN AGRICULTURE—BENEFIT AND RISKS 1 (2003), http://www.ctahr.hawaii.edu/oc/freepubs/pdf/bio-3.pdf.

tics" for about 10,000 years.[2] This process is often called genetic engineering, and is used to create genetically modified (GM) medications, seeds, crops, and the other foods that are produced from them.[3] Innovations in agricultural biotechnology can offer a wide range of benefits.[4] In these processes, DNA is key, as these traits can be passed from one generation to the next.[5] Specifically, in agriculture, biotechnology provides benefits to the consumer by seeking to improve important organisms that affect crop productivity, nutritional value, and flavor, while lowering costs to both farmers and consumers.[6] "Notable achievements include modified versions of selected crops with superior ability to withstand the chemical herbicides used in agriculture to eradicate weeds and to withstand various insect pests, crop diseases, frost, and drought."[7] These benefits will have a significant impact on increasing the availability of cheaper food in order to address the food shortage crisis across the globe.[8]

Fundamentally, biotechnology advancements in agriculture have the real potential to surpass the capabilities of traditional agricultural practices,[9] namely the conventional modifying of "crops through crossbreeding, a trial and error process carried out over generations of experimentation that can be successful within a very narrow range of related species."[10] Intellectual property rights, particularly those established by patent principles, have played an important role in the advancement of genetically modified (GM) technology.[11] Agricultural com-

2. U.S. AGENCY FOR INT'L DEV. ET AL., *What is Agricultural Biotechnology*, PROGRAM FOR BIOSAFETY SYS'S, http://absp2.cornell.edu/resources/briefs/documents/warp_briefs_eng_scr.pdf (noting that originally, improvement of desirable traits was achieved by cross-breeding).

3. *Id.*

4. *See id.*

5. *Id.*

6. WIECZOREK, *supra* note 1, at 1-3.

7. GOVERNING RISK IN GM AGRICULTURE 1 (Michael Baram & Mathilde Bourrier eds., 2011).

8. Raj Paul, Note, *Tools for Survival: Proposing a Research Exemption for Agricultural Biotechnology Patents to Alleviate Global Hunger*, 18 GEO. J. ON POVERTY L. & POL'Y 103, 111 (2010) (stating how genetically modified organisms have great potential to alleviate the issue of global hunger, particularly in impoverished regions of the world).

9. GOVERNING RISK IN GM AGRICULTURE, *supra* note 7, at 2 (opening with the suggestion that there are serious doubts to the long term viability of the industrial farming model; then going on to state that there is a need for more sustainable approaches to agricultural biodiversity, such as the patent system that encourages innovation in the area of living organisms).

10. *Id.*

11. *See* Haley Stein, *Intellectual Property and Genetically Modified Seeds: The United States, Trade, and the Developing World*, 3 NW. J. TECH. & INTELL. PROP. 160, 164 (2005) (returns on investment are a significant incentive to spend money on research in agriculture

panies are granted exclusivity in the marketplace to manufacture and sell a product by obtaining a patent. "A patent grants the inventor the right to exclude others from making, using, selling, and offering to sell or import [the] patented article."[12] The prospect of obtaining a patent is a serious incentive to large biotech firms to spend considerable amounts of money on research in order to develop genetically modified seeds with a desirable trait.

Patent protection comes directly from Congress' powers vested by the Constitution. Article I, Section 8, Clause 8 of the U.S. Constitution, states that Congress has the power "[t]o 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."[13] This clause allows Congress to issue patents, and thus, provides Congress with the power to grant the patent holder a monopoly for a limited time.[14] But does this protection extend to plant seeds? The Plant Patent Act of 1930 was the first statute that expressly granted patent protection for plants.[15] This Act, later recodified in 1952, allowed patents to be issued for plants, in addition to the already existing utility patents of 35 U.S.C. § 101 and design patents of 35 U.S.C. § 171.[16]

However, while agricultural biotechnology presents several benefits to society,[17] it also poses some patent and antitrust issues when it comes to the regulation and risks of food security.[18] Patent law and antitrust law are both driven by increased consumer welfare at their most basic principles.[19] Thus, patents and antitrust principles provide both inventors (or the patent holder when the patent holder is not the inventor) and consumers with benefits that have to balance each other. Recently, self-replicating technologies have raised several issues of patent

biotechnology).

12. 35 U.S.C. § 271(a) (2012); Tabetha Marie Peavey, Bowman v. Monsanto*: Bowman, the Producer and the End User*, 29 BERKELEY TECH. L.J. 465, 468 (2014).

13. U.S. CONST. art. I, § 8, cl 8.

14. *See* JANICE M. MUELLER, PATENT LAW 25-26 (4th ed. 2013).

15. Act of May 23, 1930, Pub. L. No. 71-245, 46 Stat. 376 (codified as amended at 35 U.S.C. §§ 161-164)

16. Act of July 19, 1952, Pub. L. No. 82-593, §161, 66 Stat. 792, 804 (codified as amended at 35 U.S.C. §§ 161-164).

17. *See generally* WIECZOREK, *supra* note 1, at 1-3; Paul, *supra* note 8, at 105 (discussing how biotechnology may help farmers increase productivity).

18. *See, e.g.*, MARK A. POLLACK & GREGORY C. SCHAFFER, WHEN COOPERATION FAILS THE INTERNATIONAL LAW AND POLITICS OF GENETICALLY MODIFIED FOODS 36-37 (2009).

19. *See* Greg Dolin, *Guest Post: Resolving the Patent-Antitrust Paradox: Promoting Consumer Welfare Through Innovation*, CTR. FOR THE PROT. OF INTELL. PROP., ANTONIN SCALIA LAW SCH., GEORGE MASON UNIV. (May 2, 2013). http://cpip.gmu.edu/2013/05/02/guest-post-resolving-the-patent-antirust-paradox-promoting-consumer-welfare-through-innovation.

and antitrust laws.[20] These technologies pose challenges to businesses, lawyers, and judges to establish policy framework that will appropriately balance innovation with competition, or in other words, allowing self-replicating technologies to be efficiently developed and commercialized for the benefit of society.

This Note will examine recent efforts by both the Canadian and U.S. Supreme Courts that dealt with the legal and policy questions in one of the most applied self-replicating advancement examples today: the genetically modified-seed. Part II of this note will discuss the exhaustion doctrine of patent law, a judge-made doctrine designed to end the patent owner's control over downstream commerce once its patented goods or methods are sold. Patent exhaustion, also called the First Sale Doctrine is grounded in concerns of the anticompetitive effect of a patent owner's exclusionary rights.

Part III of this note will go into in-depth analyses of the leading authority from these jurisdictions, and will claim that the U.S. Supreme Court's holding was more accurate based on the balancing of patent and antitrust principles. Part IV of this note will present some of the patent and antitrust principles that are implicated by cases involving current self-replicating technologies. Part V of this note will compare two proposals for patent exhaustion application to self-replicating technologies, and support a policy that courts refrain from setting a bright-line rule. Part VI will conclude with a recapitulation of where the law is today.

## II. PATENT LAW AND THE DOCTRINE OF PATENT EXHAUSTION

This section will discuss what is arguably, "the most important segment of the intellectual property system − patent law."[21] A patent is a property right granted by the U.S. Government to an inventor.[22] A patent holder obtains the right to exclude others from making, using, selling, or offering to sell the patented invention without authority from the patent holder.[23] These rights are robust and provide the strongest monopoly in the intellectual property system in order to

20. *See generally* William L. Warren & David E. Wigley, *Do Patents Control Self-Replicating Technologies?*, GENETIC ENG'G & BIOTECHNOLOGY NEWS (May 1, 2013), http://www.genengnews.com/gen-articles/do-patents-control-self-replicating-technologies/4844/; U.S. DEP'T OF JUSTICE, COMPETITION AND AGRICULTURE: VOICES FROM THE WORKSHOPS ON AGRICULTURE AND ANTITRUST ENFORCEMENT IN OUR 21ST CENTURY ECONOMY AND THOUGHTS ON THE WAY FORWARD 13-14 (2012), https://www.justice.gov/sites/default/files/atr/legacy/2012/05/16/283291.pdf.

21. ROBERT TOMKOWICZ, INTELLECTUAL PROPERTY OVERLAPS: THEORY, STRATEGIES, AND SOLUTIONS 26 (2013).

22. *See Patent FAQs*, U.S. PATENT & TRADEMARK OFFICE, http://www.uspto.gov/inventors/patents.jsp#heading-1 (last modified Dec. 13, 2014, 3:55 PM).

23. 35 U.S.C. § 271(a) (2012).

incentivize inventors to create new inventions to benefit society.[24] "Patents provide exclusivity for the inventor in commercializing his [or her] invention."[25] The patentee must meet certain criteria before the patentee will be granted patent rights.[26] Basically, the criteria for a patent requires that the invention present something "new, involve an inventive step, and [be] susceptible to industrial applicability."[27] In order for an invention to be novel and have an inventive step, it must not have been previously disclosed prior to the filing of the application for a patent,[28] and the invention must not have been obvious to a person skilled in the art at the time the application was filed.[29] The last requirement of being industrially applicable is somewhat fluid and has been construed to be rather broad.[30] Inventions will be presumed to be capable of industrial application "if the invention can be made or used in any kind of industry . . . ."[31]

If the patent application meets these requirements, the inventor will be granted a monopoly in the invention. However, the monopoly is not endless; in the U.S., inventors typically have 20 years of protection for their inventions.[32] A patentee's rights can also end after the device containing the invention is first sold to the consumer. Because of the anticompetitive effects monopolies have on restraining trade, the Supreme Court has recognized the doctrine of patent exhaustion.[33] "Under the *first sale* doctrine and the doctrine of *patent exhaustion*, a patentee who unconditionally sells a product that incorporates the patented invention exhausts all rights to control the product."[34] This allows the purchaser of the patented invention to have the rights to use, repair, modify, discard, and resell the item.[35]

Consequently, the patentee no longer has the right to control the downstream use, modification, discarding, reselling, or ordinary repair of the patent device that includes the patented invention. Realizing that a continued monopoly

24. TOMKOWICZ, *supra* note 21, at 26.

25. ANDREAS HÜBEL ET AL., BIOPATENT LAW: PATENT STRATEGIES AND PATENT MANAGEMENT 2 (Ulrich Storz ed., 2012).

26. *Id.*

27. *See id.* at 3.

28. *See id.*

29. *See id.* at 5.

30. *Id.* at 7.

31. *Id.*

32. *Id.* at 25, 26.

33. Quanta Comput., Inc. v. LG Elec's., Inc., 553 U.S. 617, 625 (2008). Justice Thomas writing that the court first applied the doctrine of patent exhaustion in the *Bloomer v. McQuewan* case in 1853. The doctrine of patent exhaustion is similar to copyright law's doctrine of first sale that limits a copyright owner's rights in the copyrighted work. *Id.*

34. AMY L. LANDERS, UNDERSTANDING PATENT LAW 501 (2d ed. 2012).

35. *Id.*

over a product containing a patented invention would cause "inconvenience and annoyance to the public that . . . are too obvious to require illustration,"[36] the Court in *Keeler v. Standard Folding Bed Co.* articulated that "one who buys patented articles of manufacture from one authorized to sell them becomes possessed of an absolute property in such article[s], unrestricted in time or place."[37] Patent exhaustion doctrine is rooted in the rationale that "[t]he purpose of the patent law is fulfilled with respect to any particular article when the patentee has received his reward . . . by the [authorized] sale of the article."[38] Further, "once that purpose is realized the patent law affords no basis for restraining the use and enjoyment of the thing sold."[39]

The patent exhaustion doctrine seems straightforward enough: the patentee's rights in a particular article, including the patented invention, are exhausted by the licensed sale of the article. However, it is not that trivial: application of the doctrine has been everything but consistent.[40] Enforcement of patent rights is particularly difficult when the patented article involves self-replicating technology and accidental infringers, especially in regard to plant-seed patents.[41] The Federal Circuit and U.S. Supreme Court have distinguished between a patent owner's right to use and the right to make a patent invention.[42] As understood in case law, "[w]hile the patentee relinquishes the right to control the *use* of a patented article upon selling it, such a sale does not authorize the purchaser to *make* a newly infringing article . . . ."[43] Thus, the critical issue in most plant seed patent cases is whether the common seed saving or replanting custom by farmers constitutes an authorized use of the patented seeds, or whether this system consti-

36. Keeler v. Standard Folding Bed Co., 157 U.S. 659, 667 (1895).

37. *Id.* at 666.

38. Bowman v. Monsanto Co., 133 S. Ct. 1761, 1766 (2013); United States v. Univis Lens Co., 316 U.S. 241, 251 (1942).

39. United States v. Univis Lens Co., 316 U.S. 241, 251 (1942).

40. *See* John W. Osborne, *A Coherent View of Patent Exhaustion: A Standard Based on Patentable Distinctiveness*, 20 SANTA CLARA COMPUT. & HIGH TECH. L.J. 643, 646 (2004) (stating that the available case law on the doctrine of patent exhaustion is confusing and conflicting).

41. *See* Marcella Downing-Howk, *The Horns of a Dilemma: The Application of the Doctrine of Patent Exhaustion and Licensing of Patented Seed*, 14 SAN JOAQUIN AGRIC. L. REV. 39, 39 (2004) (recognizing that the "seed saving" custom by farmers and non-affirmative acts, such as pollination, present unique and difficult issues to the patent exhaustion doctrine).

42. *Bowman*, 133 S. Ct. at 1765; Monsanto Co. v. Bowman 657 F.3d 1341, 1348 (Fed. Cir. 2011) (The ***right to use*** a patented article following an authorized sale, the court explained, ". . .does not include the right to construct an essentially new article on the template of the original, for the ***[right to make]*** the article remains with the patentee.") (emphasis added).

43. Jeremy N. Sheff, *Self-Replicating Technologies*, 16 STAN. TECH. L. REV. 229, 233 (2013).

tutes an unauthorized production of infringing articles. Plant seed patent cases (and presumably other self-replicating technologies) will encounter the issue of whether the purchaser is *using* the patented article in an authorized way, or whether the purchaser is *making* (producing) unauthorized articles. The next section will analyze how the Supreme Court has ruled on the issue as it relates to self-replicating technology in plant seed patented articles.

## III. COMPARATIVE ANALYSIS OF AUTHORITY ON PATENTED SELF-REPLICATING SEED TECHNOLOGY

Both the U.S. and Canadian Supreme Courts have found that a patent owner's rights are not exhausted after the seeds are purchased, thus extending an owner's rights beyond the first sale.[44] Precedent cases in both the U.S. and Canada involve Monsanto, a St. Louis, Missouri based seed company.[45] Monsanto is one of the top seed firms in the United States.[46] In the soybean market, Monsanto controls almost ninety percent of the seeds sold.[47] The next two subsections will go into an in-depth case analysis of the Canadian Supreme Court case, *Monsanto Canada, Inc. v. Schmeiser*, and the U.S Supreme Court case, *Bowman v. Monsanto Co*.

### *A. Monsanto v. Schmeiser*

This case involved Monsanto Canada, Inc. and Monsanto Company's patent relating to the plant seed tolerance to glycophosphate herbicides, such as Roundup and other cells containing those genes.[48] "Glycophosphate herbicide is one of the most widely utilized herbicides in the [U.S.]" to kill weeds in agriculture and forestry.[49]

#### *1. Factual Background*

Monsanto Canada, Inc. sued Perry Schmeiser, a canola farmer, alleging that Schmeiser used its patented seeds for commercial growth of canola in Sas-

44. *Bowman*, 133 S. Ct. at 1769; Monsanto Can. Inc. v. Schmeiser, [2004] 1 S.C.R. 902, 907.

45. *See generally Bowman*, 133 S. Ct. 1761; *Monsanto Can. Inc.*, 1 S.C.R. 902 (Can.).

46. *See* Christina Snrich, *The 10 Companies Controlling the World's Seed Supply*, NATION OF CHANGE (Oct. 21, 2010), http://www.nationofchange.org/10-companies-controlling-world-s-seed-supply-1382363748.

47. *See* Scott Tong, *Monsanto: The Behemoth that Controls 90 Percent of the Soybean Production*, MARKETPLACE (May 13, 2013, 3:35 P.M.), http://www.marketplace.org/2013/05/13/sustainability/monsanto-behemoth-controls-90-percent-soybean-production.

48. *Monsanto Can. Inc.*, 1 S.C.R. at 903.

49. *Glycophosphate General Fact Sheet*, NAT. PESTICIDE INFO. CENTER, http://npic.orst.edu/factsheets/glyphogen.html (last visited Apr. 24, 2016).

katchewan, without purchasing or obtaining a license for the seeds.[50] Monsanto was able to show that 95-98 percent of Schmeiser's 1998 canola crop had the Roundup Ready gene.[51] It was not completely clear how the seeds came onto Schmeiser's property.[52] It was speculated that they could have blown onto his farm, and survived after Schmeiser sprayed his crops with the herbicide.[53] The trial judge found none of Schmeiser's proposed explanations reasonable or sufficient for how the seeds came to be on his farm.[54] Schmeiser argued that the subject matter claimed in the patent was unpatentable following the holding in *Harvard College v. Canada* ("*Harvard Mouse*").[55] However, the Court distinguished this case from *Harvard Mouse*, because the patent that was refused in that case was for mammalian cells, whereas the patent here was for plant cells.[56]

*2. Analysis*

The Supreme Court of Canada[57] analyzed whether an alleged infringer "used" patented cells and genes, by looking at: 1) the plain meaning of the word use, 2) the purpose of the statute (s. 42 of the Canadian Patent Act), 3) the context of the case, and 4) case law.[58] The *Schmeiser* Court found the plain meaning of the word "'use'. . . denotes utilization with a view to production of advantage."[59] Meaning, that "use" or exploitation is determined by whether the alleged infringer's actions deprived the inventor of the full enjoyment of the inventor's monopoly right under patent law.[60] The *Schmeiser* Court found that the making and saving of plant seed, then harvesting and selling the resulting plants, constituted "'utilization' of patented material for production and advantage . . . ."[61] Intuitively, Schmeiser used Monsanto's invention when he saved, harvested, and sold crops from the plants containing the Roundup Ready

50. *Monsanto Can. Inc*., 1 S.C.R. at 903.

51. *Id.* at 912.

52. *Id.*

53. *Id.*

54. *Id.*

55. *Id.* at 916; *see* Harvard College v. Canada, 2002 SCC 76 [2002] 4 S.C.R. 45 (Can.) (holding of the where the Canadian Supreme Court finding plants and seeds to be unpatentable "higher life forms").

56. *Monsanto Can. Inc*., 1 S.C.R. at 916.

57. *See Monsanto Can. Inc.*, 1 S.C.R. 902. The case and the Canadian Supreme Court's reasoning will be referred to as *Schmeiser* in order to compare how the Canadian Supreme Court viewed this issue.

58. *Id.* at 904.

59. *Id.*

60. *See id.* at 919.

61. *Id.* at 904.

gene.[62]

Next, the *Schmeiser* Court stated that the purpose of section 42 of the Patent Act is to define the exclusive rights granted to the patent holder.[63] Based on this purpose, the *Schmeiser* Court held that it was within the purpose of section 42 to prohibit "any act that interferes with the full enjoyment of the monopoly granted to the patentee."[64] The *Schmeiser* Court held that it was also within the meaning of the Statute to find a presumption of use if the defendant deprived Monsanto of the full enjoyment of the monopoly the patent confers.[65] Since, the Monsanto Roundup Ready patent's objective is the production of plants that are resistant to Roundup herbicide, and the patent allowed Monsanto to charge a fee for the seeds, the court found that Schmeiser deprived Monsanto of the full enjoyment of its monopoly by cultivating canola plant with the patented trait without compensating Monsanto.[66]

Lastly, the Court looked at case law to aid its analysis of the infringement claim.[67] Case law showed that where a patented part or process plays a [significant] role in production, "use" not only applied to both patented products and processes, but also to their output as well.[68] This was particularly relevant in disposing Schmeiser's argument that growing plants did not amount to "using" their patented genes and cells. Case law guided the *Schmeiser* Court to find that "a defendant infringes a patent when the defendant manufactures, seeks to use, or uses a patented part that is contained within something that is not patented, provided that the patented part is significant or important."[69] The *Schmeiser* Court also noted that the defendant's intention was an irrelevant factor in the analysis to determine infringement.[70]

In this case, as is the situation involving patented plant genes, the patented gene is not only a part of the resulting plant; rather, the patented gene is present throughout the entire plant itself.[71] Evidently, Schmeiser's canola plants could not have existed independently from the patented genes of the genetically modi-

62. *Id.*

63. *See id.* at 919.

64. *Id.* (noting the exclusive rights of a patent holder are the right to the full enjoyment of the monopoly granted by the patent).

65. *Id.* at 926-27.

66. *Id.* at 930. Monsanto's licensing fee was $15 per acre to farmers wishing to grow canola plants and Schmeiser cultivated 1030 acres of plants with the patented properties. Thus, Schmeiser escaped paying at least $15,450 in licensing fees. *Id.*

67. *Id.* at 920.

68. *Id.* at 921.

69. *Id.*

70. *Id.* at 924.

71. *Id.* at 930 (noting that clearly patented genes are a significant part of the plant).

fied seeds that they were grown from. In the end, the court decided that all of the infringement factors favored Monsanto and supported a determination that Schmeiser had infringed Monsanto's patented Roundup Ready seeds under the Patent Act.[72]

Next, the Canadian Supreme Court moved on to the issue of whether the relief awarded by the trial court was appropriate. The trial judge granted Monsanto injunctive relief, and awarded the seed company an "accounting of profits made by [Schmeiser] through growing Roundup Ready Canola, which he ultimately quantified at $19,832."[73] The Court found difficulty with this sum, particularly its lacking sufficient evidence that it was calculated based on the "differential profit approach."[74] The "differential profit approach" is "[a] comparison . . . between the defendant's profits attributable to the invention and his profit had he used the best non-infringing option."[75] In the Court's view, the trial judge failed to identify a causal relationship between Schmeiser's profits through growing Roundup Ready canola and the invention.[76] In the end, the Court found that Monsanto was not entitled to any damages because the facts presented failed to show that Schmeiser made any more profit by using Roundup Ready canola seeds over ordinary canola seeds.[77]

### *B. Bowman v. Monsanto*

In 2013, the U.S. Supreme Court granted cert to hear a case between Monsanto Company and Vernon Bowman.[78] The facts of this lawsuit are straightforward, but slightly different than the *Schmeiser* case from the Canadian Supreme Court.[79]

#### *1. Factual Background and Procedural History*

Vernon Hugh Bowman was a 75-year-old farmer from Knox County, Indiana, where he owned three hundred acres of family-owned land.[80] Each year,

72. *Id.* at 937.
73. *Id.*
74. *Id.* at 937-38.
75. *Id.* at 938.
76. *Id.*
77. *Id.* at 938-39.
78. *See generally* Bowman v. Monsanto Co., 133 S. Ct. 1761 (2013).
79. *Compare Monsanto Can. Inc.*, 1 S.C.R. 902, *with Bowman*, 133 S. Ct. at 1761. The major difference that the accused in *Schmeiser* did not purchase Monsanto's the Roundup resistant seeds, whereas Bowman did in fact purchase the Roundup resistant seeds to plant on his farm.
80. *Bowman*, 133 S. Ct. at 1765; CTR. FOR FOOD SAFETY, SEED GIANTS VS. U.S.

Bowman planted two crops, typically wheat, corn, and/or soybeans.[81] As Bowman put it, growing two crops within the same harvest (one after the other) is a highly risky approach to farming.[82] Bowman explained that after the first harvest, he often went on to plant a second crop.[83] Consequently, planting a second crop within the same season is risky for farmers because of the increased likelihood of unfavorable weather and natural disasters affecting the overall yield.[84] Therefore, farmers are generally required to plant more seeds in order to harvest a good yield from a crop planted later in the season.[85] Due to the increased investment and higher risk involved, Bowman admitted that he does not like to invest a lot of money into the second crop.[86]

In 1999, because of the heightened risk associated with planting a second crop within the same season, Bowman decided to try something different in order to save some money on the second crop.[87] For his first crop in that year, Bowman purchased Monsanto-licensed Roundup Ready soybean seeds and signed Monsanto's Technology Agreement.[88] However, in planting the second crop, Bowman bought and used cheap "commodity seeds" from a grain elevator.[89] Commodity seeds are generally cheaper, because they consist of saved seeds of prior harvests from local farmers, and are largely used for industrial or animal use.[90]

Since many of the local farmers used Roundup Ready seeds, Bowman predicted that it was likely that much of the commodity grain would contain seeds with Monsanto's Roundup Ready patented trait.[91] After planting the commodity seeds and treating them with the glycophosphate-based herbicide, he confirmed this prediction; as "a significant portion of the new plants survived the treatment,

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FARMERS (2013), http://www.centerforfoodsaftety.org/files/seed-giants_final_04424.pdf.

81. *Bowman*, 133 S. Ct. at 1765.

82. *See* Eliot Marshall, *Supreme Court to Review Scope of Monsanto's See Patents*, 339 SCI. 639, 639 (2013) (stating Bowman calls this approach a "dumb tightwad" method of farming).

83. *See id.*

84. *See id.* (noting the second crop is planted and grown in the mid-late summer, rather than the spring, where there is an increased likelihood of "heat, drought, and floods").

85. *See id.* Bowman suggested that a farmer needs to plant twice as many seeds to harvest a good yield from the second crop. *Id.*

86. *See id.*

87. *See id.*

88. Bowman v. Monsanto Co., 133 S. Ct. 1761, 1765 (2013).

89. *See Bowman*, 133 S. Ct. at 1765; Marshall, *supra* note 82, at 639.

90. *See Bowman*, 133 S. Ct. at 1765; Marshall, *supra* note 82, at 639 (noting Bowman reckoned the commodity seeds could cost as low as less than one-fifth the cost of licensed seeds).

91. *Bowman*, 133 S. Ct. at 1765.

and produced in their turn a new crop of soybeans with the Roundup Ready trait."[92] Bowman went on to save seeds from the second harvest, to sell and use in subsequent years.[93] The Supreme Court opinion noted that he was able to replicate this method for the next eight years.[94]

Although Monsanto employs a large staff to locate potential infringing farmers, they claim to only go after those who intentionally plant Roundup Ready seeds without following the terms of the license agreement.[95] Monsanto sued Bowman in 2007 for patent infringement, after the company found out about Bowman's planting methods. In its brief to the Supreme Court, Monsanto argued that Bowman intended to illegally make a patented technology by spraying the seeds with glyphosate-based herbicide; stocking seeds with the Roundup Ready trait, and killing off the plants that lacked the patented technology.[96] Bowman argued that Monsanto's patent rights had "exhausted," under the patent exhaustion doctrine outlined previously.[97] Bowman argued that Monsanto could not control his use of the soybean seeds, because the commodity seeds were part of the prior authorized purchases from local farmers to the grain elevator.[98] Essentially, Bowman argued that the commodity seeds he purchased were no longer protected by Monsanto's patent.

*2. Analysis*

Monsanto sued for patent infringement in the U.S. District Court in the Southern District of Indiana.[99] The district court rejected Bowman's argument that Monsanto's patent rights had exhausted, awarded Monsanto $84,456 in total damages, and permanently enjoined Bowman from making, using, selling or offering to sell any of Monsanto's patented crop technologies.[100] The damage award was based on a reasonable royalty of acres planted with commodity soybeans.[101] Bowman appealed the decision against him, but the Federal Circuit

92. *Id.*

93. *Id.* (noting Bowman also profited by selling some of second crop seed back to the grain elevators).

94. *Id.* Each year, Bowman planted saved seed from the previous year, sometimes adding more soybean seeds from a grain elevator to harvest a second crop. *Id.*

95. *See* Marshall, *supra* note 82, at 639.

96. *Id.*

97. *Bowman*, 133 S. Ct. at 1766; *see* Quanta Comput., Inc. v. LG Elecs., Inc., 553 U.S. 617, 625 (2008).

98. *Bowman*, 133 S. Ct. at 1765.

99. Monsanto Co. v. Bowman, 686 F. Supp. 2d 834 (S.D. Ind. 2009).

100. *Bowman*, 133 S. Ct. at 1765.

101. *Id.*

Court affirmed the District Court's decision in favor of Monsanto.[102] The Federal Circuit Court reasoned that the right to use the patented article following an authorized sale, "do[es] not include the right to construct an essentially new article on the template of the original, for the right to make the article remains with the patentee."[103] The Supreme Court granted certiorari in order to determine whether the limiting effects on a patentee's rights under the patent exhaustion doctrine applied to this case.[104]

In affirming the Federal Circuit's decision, the Supreme Court analyzed the doctrine of patent exhaustion by looking at previous Supreme Court rulings, and applying those previous holdings to this case.[105] The Supreme Court noted that longstanding doctrine of patent exhaustion limits the patent rights that survive after the initial authorized sale of a patented item.[106] In the *Univis Lens Co.* case from 1942, the Supreme Court explained that the basis of patent law is to confer on the patent owner a reward for sharing the "particular article" (innovation) with the public, through a sale of the "particular article."[107] However, once the patentee has received the reward for use of the invention by the sale of the article, "patent law affords no basis for [further] restraining the use and enjoyment of the thing sold."[108] Thus, the doctrine does not affect the patentee's right to prevent a buyer from making new copies of the patented item.

The Supreme Court has stated that, "the purchaser of the [patented] machine does not acquire any right to construct another machine either for his own use or to be vended to another for any purpose."[109] The practical outcome of extending the doctrine of patent exhaustion to permit purchasers to reconstruct the subject of a patent, without having to pay the patentee proper royalties would undermine the patentee's express right "to exclude others from making" the article.[110] This rationale has not been overturned, and is still good law. Ultimately, the court determined that Bowman's actions of planting, saving, and replanting of the second harvest seeds effectuated the creation of new copies of Monsanto's soybean without authorization, and the exhaustion doctrine did not shield him

102. *Id.*

103. Monsanto Co. v. Bowman 657 F.3d 1341, 1348 (Fed. Cir. 2011) (alternation in original).

104. *Bowman*, 133 S. Ct. at 1766.

105. *See generally* Quanta Comput., Inc. v. LG Elecs., Inc., 533 U.S. 617 (2008); Wilbur-Ellis Co. v. Kuther, 377 U.S. 422 (1964); United States v. Univis Lens Co., 316 U.S. 241 (1942).

106. *Bowman*, 133 S. Ct. at 1766; *Quanta Comput., Inc.*, 533 U.S. at 621.

107. *See Univis. Lens Co.*, 316 U.S. at 251.

108. *Id.*

109. Mitchell v. Hawley, 83 U.S. 544, 548 (1872).

110. 35 U.S.C. § 154 (2012); *see Mitchell*, 83 U.S. at 548.

from liability for patent infringement.[111]

The Court reasoned that, "if simple copying were a protected use, a patent would plummet in value after the first sale of the first item containing the invention."[112] Moreover, the court also rejected Bowman's weaker argument that seeds pose a unique, different approach to the prohibition of producing new copies of the patented articles.[113] Bowman's so called "seeds-are-special argument" alleged that if using seed storage methods constituted reproducing a patented article, "it was the planted soybean, not Bowman himself, that made the replicas of Monsanto's patented invention."[114] The Court reasoned that Bowman was not a passive observer in the replication process because he took several proactive steps to increase his stock of soybeans with Monsanto's patented Round Ready resistant trait.[115]

In the end, the Court noted that Bowman came up with the novel plan to harvest crops from the Round Ready seeds without having to pay the usual premium price for the seeds.[116] Most notably, Bowman purchased the seeds from a grain elevator at a significantly cheaper price; planted the seeds; recognized the preferred characteristic of cultivar in order to select against any plants that did not the preferred characteristic; used seed storage methods that maintained viability; knew the conditions that maximized germination of the seeds for his late season crop eight years in a row; and harvested the seeds, which he marketed or saved to use in the next cycle.[117] In all this, the Court determined that it was Bowman, rather than the soybean, that controlled the reproduction of Monsanto's patented invention.[118] In reaching its decision, the Supreme Court explicitly stated that its decision was limited to cases involving genetically modified seeds, and did not apply to situations involving other self-replicating technologies.[119]

So, between the *Schmeiser* case in Canada, and the *Bowman* case here in the U.S., which Court's holding is more persuasive? At first glance, it may seem that the *Schmeiser* and *Bowman* decisions are in congruence.[120] However, there is a key difference between the decisions that makes the *Bowman* decision more

111. *Bowman*, 133 S. Ct. at 1766-67.
112. *Id.* at 1768.
113. *See id.*
114. *Id.* at 1768-69.
115. *Id.* at 1769.
116. *Id.*
117. *Id.*
118. *Id.*
119. *Id.*
120. *See* Monsanto Can. Inc. v. Schmeiser, [2004] 1 S.C.R. 902, 937 (Can.); *see also Bowman*, 133 S. Ct. at 1769. Both courts found that the defendants infringe the seed company's patent.

persuasive: both courts found that the defendant infringed Monsanto's Roundup Ready seed patent.[121] However, the *Bowman* decision recognized the likelihood of more complex and diverse self-replicating inventions and limited its holding to Bowman's case.[122] Thus, the *Bowman* decision is more persuasive, mainly because it leaves room for reconsideration as times and self-replicating technologies progress.

## IV. CONFLICTS POSED BY PATENT AND ANTITRUST PRINCIPLES

Although the U.S. Supreme Court limited its holding in favor of Monsanto to cases involving seed owners, it did not did not address how the doctrine of patent exhaustion would apply to other more prevalent and complex self-replicating inventions.[123] The holding in favor of Monsanto presents important issues in other areas of the law, particularly antitrust law, that have not been resolved.[124] Scholars believe that intellectual property and antitrust laws are the two most important laws fostering innovation.[125] Yet many of these experts argue that these two areas of the law are not being used efficiently to encourage and regulate innovation.[126] It has been observed that patent and antitrust principles are aimed at promoting innovation in different, often conflicting ways.[127] Patent principles promote innovation by providing protection for inventors of new technologies, and compensating the inventors for sharing their patented technologies with society; while antitrust principles promote innovation by focusing on how conduct effects competition.[128]

The foundation of the patent system is based on the right to exclude.[129] In theory, a patentee's right to exclude is essential and necessary to encourage inno-

121. *See Monsanto Can. Inc.*, 1 S.C.R. at 937; *see also Bowman*, 133 S. Ct. at 1769.

122. *Bowman*, 133 S. Ct. at 1769.

123. *Id.*

124. *See* Brianna M. Schonenberg, Comment, *Twenty Years in the Making: Transitioning Patented Seed Traits into the Generic Market*, 97 MARQ. L. REV. 1039, 1071-72 (2014) (discussing some of antitrust implications through a lawsuit between Monsanto and DuPont which was eventually settled).

125. *See* MICHAEL A. CARRIER, INNOVATION FOR THE 21ST CENTURY: HARNESSING THE POWER OF INTELLECTUAL PROPERTY AND ANTITRUST LAW 1 (Oxford University Press, Inc. 2009) [hereinafter CARRIER, INNOVATION FOR THE 21ST CENTURY].

126. *See id.*

127. Michael A. Carrier, *Resolving the Patent-Antitrust Paradox Through Tripartite Innovation*, 56 VAND. L. REV. 1047, 1048 (2003) [hereinafter Carrier, *Resolving the Patent-Antitrust Paradox*].

128. *Id.*

129. *See* 35 U.S.C. § 154(a)(1) (2012).

vation: "the first step in creating marketable products."[130] It is typically expensive to invent new technology, which makes it very costly (to inventors) when free-riders imitate and copy the invention after it has been developed.[131] "Progress is rarely the result of a flash of genius and is more often the product of diligence and hard work."[132] Free-riders and imitators suppress innovation by deterring inventors from taking on the risks of creating new technologies.[133] In order to incentivize inventors, the patent laws grant inventors an exclusive right to exclude for a twenty year period.[134] The right to exclude enables inventors to charge higher prices than their post-invention costs, which allows them to recover their initial investment and offers a temporary period to earn competitive returns from their innovative efforts.[135] Therefore, the theory implies that innovators will be less likely to share their inventions with society; and subsequently, will keep it to themselves for personal use, or may choose to refrain from contributing to the increase of knowledge and technology altogether.[136] The Patent law right to exclude is designed to increase the level of innovation in society.

However, the very exclusion that forms the foundation of the patent system clashes with and may be punishable under antitrust principles.[137] Antitrust laws presume that competition leads to lower prices, higher output, and more innovation which is better for consumer welfare and economic fairness in the end.[138] Nonetheless, not every case of monopolistic conduct is bad and construed as harmful to free trade. Economists distinguish between monopolistic power that is achieved by surpassing competitors through excellence and efficiency, and monopoly power gained by driving competition down through coercive force.[139]

130. CARRIER, INNOVATION FOR THE 21ST CENTURY, *supra* note 125, at 31; *see* DAN L. BURK & MARK A. LEMLEY, THE PATENT CRISIS AND HOW THE COURTS CAN SOLVE IT 7 (The University of Chicago Press 2009).

131. *See* BURK & LEMLEY, *supra* note 130, at 7; Kenneth W. Dam, *The Economic Underpinnings of Patent Law*, 23 J. LEGAL STUD. 247, 247 (1994).

132. Zachary Loney, Note, *Bowman's Beanstalk: Patent Exhaustion in Self-Replicating Technologies*, 15 VAND. J. ENT. & TECH. L. 949, 980 (2013); *see* Graham v. John Deere Co. of Kansas City, 383 U.S. 1, 15 (1966) (rejecting the "flash of creative genius" test for patentability); Cuno Eng'g Corp. v. Automatic Devices Corp., 314 U.S. 84 (1941).

133. *See* Dam, *supra* note 131, at 247.

134. *See* 35 U.S.C. § 154(a)(2) (2012).

135. *See* Tracy R. Lewis & Dennis A. Yao, *Some Reflections on the Antitrust Treatment of Intellectual Property*, 63 ANTITRUST L.J. 603, 605 (1995).

136. *See id.* (distinguishing intellectual property from other types of property).

137. *Id.* at 604 (acknowledging that antitrust principles strictly discourage monopoly positions created by exclusionary practices).

138. CARRIER, INNOVATION FOR THE 21ST CENTURY, *supra* note 125, at 4.

139. Leonard E. Read, *Good and Bad Monopoly*, THE FREEMAN (1960), http://fee.org/freeman/detail/good-and-bad-monopoly.

The first method is not only accepted, but believed to be beneficial to all of the parties concerned; while the latter method "merits opposition . . . usually [ ] provided by [the] government."[140] As a result, the key issue for courts and economists to determine is when a patentee crosses over into the "bad" monopoly category so as to warrant regulation of its license agreements.

Unlike the Patent Act, antitrust's Sherman Act does not expressly state any universal goals to promote innovation.[141] However, antitrust laws also have significant effects on innovation. Positively, antitrust laws aim to promote competition by regulating monopolies, and removing entrance barriers that block technological innovators.[142] Negatively, antitrust laws can stifle innovation by overregulating business activity and invalidating license agreements between competitors.[143] Section 1 of the Sherman Act outlaws contracts, trusts, and conspiracies to restrain trade.[144] Section 2 of the Sherman Act prohibits parties from engaging in monopolies or monopolistic trade practices.[145] Section 7 of the Clayton Act prohibits mergers and acquisitions that may substantially lessen competition, or tend to create a monopoly.[146] Neither the specific language of the statutes or the legislative history give insight on what objectives should be served through antitrust laws. However, it is believed that Congress' intentions were clear that the courts would play a vital role in developing antitrust jurisprudence.[147]

There are few cases involving the Monsanto Company, and claims of violations under the Sherman Act. One potential case that could have litigated these antitrust concerns, was between Monsanto and DuPont.[148] In 2009, Monsanto filed a lawsuit against DuPont for patent infringement, breach of contract, and unjust enrichment.[149] DuPont responded with seven antitrust counterclaims, which included that Monsanto inserted anticompetitive restrictions in their license agreements with independent seed companies.[150] The parties' claims

140. *Id.*

141. *See* Carrier, *Resolving the Patent-Antitrust Paradox*, *supra* note 127, at 1056.

142. CARRIER, INNOVATION FOR THE 21ST CENTURY, *supra* note 125, at 3.

143. *See id.* These negative effects on innovation include license and settlement agreements, research and development markets, and patent pools, which agreements between two or more patent owners to license one or more of their patents to one another or to third parties.

144. 15 U.S.C. § 1 (2012).

145. 15 U.S.C. § 2.

146. 15 U.S.C. § 18.

147. *See* Carrier, *Resolving the Patent-Antitrust Paradox*, *supra* note 127, at 1057; *see also* 21 CONG REC. 2456 (1890) (noting difficulty in distinguishing lawful and unlawful anticompetitive practices, and therefore leaving the courts to determine each particular case).

148. Monsanto Co. v. E.I. du Pont de Nemours & Co., No. 4:09CV00686ERW, 2009 U.S. Dist. LEXIS 84512, at *3 (E.D. Mo. Sept. 16, 2009).

149. *Id.*

150. *Id.*

against each other were bifurcated into separate trials, with Monsanto's patent infringement claims to be adjudicated first.[151] Monsanto won the initial case involving the patent infringement claims against DuPont, and was awarded one billion dollars in damages.[152] Perhaps fearing (and anticipating) that DuPont would win in an appeal to contest the damage amount; even worse, the ramifications of an unsatisfactory ruling in the upcoming antitrust lawsuit, Monsanto reached a settlement agreement with DuPont, where it relinquished its billion-dollar judgment in exchange for DuPont agreeing to drop its antitrust law suit against Monsanto.[153] Further, the two companies agreed to a new licensing deal where DuPont would pay Monsanto $1.75 billion dollars over a ten year period, in exchange for "broad access to Monsanto's [ ] seed technology for the development of new agricultural seed products."[154] Pursuant to these facts, the U.S. Department of Justice decided to conduct its own investigation of Monsanto for potential antitrust practices.[155] In late 2012, the government closed its investigation into the seed industry and Monsanto, without pursuing the charges.[156]

Since the *Monsanto v. DuPont* suit was settled and the Government decided against pursuing antitrust claims, Monsanto has not been found to be in violation of any antitrust laws. Based on judicial opinions and economists' conclusions, one can confidently state that innovation is the most important factor in the growth of the economy.[157] In today's dynamic global economy, new inventions are constantly replacing those that came before, as competitors are motivated to improve existing products or introduce new products in order to maintain their market share.[158] While goals of innovation are not expressly written in the Sher-

151. *Id.* at *4.

152. *See Seeds Market Clash: Monsanto Wins One Billion Dollars Lawsuit to DuPont*, MERCO PRESS (Aug. 7, 2012, 8:25 UTC), http://en.mercopress.com/2012/08/07/seeds-market-clash-monsanto-wins-one-billion-dollars-lawsuit-to-dupont.

153. *Id.*

154. Carey Gillam, *Monsanto, DuPont strike $1.75 Billion Licensing Deal, End Lawsuits*, REUTERS, (March 26, 2013), http://www.reuters.com/article/2013/03/26/us-monsanto-dupont-gmo-idUSBRE92P0IK20130326.

155. Ian Berry & David Kesmodel, *U.S. Closes Antitrust Investigation Into Seed Industry, Monsanto*, WALL ST. J. (Nov. 16, 2012), http://www.wsj.com/articles/SB10001424127887324735104578123631878019070.

156. *Id.*

157. Philip Areeda, *Antitrust Law as Industrial Policy: Should Judges and Juries Make It*, *in* ANTITRUST, INNOVATION, AND COMPETITIVENESS 29, 31 (Thomas M. Jorde & David J. Teece eds., 1992). "At least since Schumpeter wrote nearly fifty years ago, innovation has been thought to contribute far more to our well-being than keeping prices closer to costs through competition." *Id.*

158. U.S. DEP'T OF JUSTICE & FED. TRADE COMM'N, ANTITRUST ENFORCEMENT AND

man or Clayton Act, it is well supported that antitrust law is a critical component to promoting innovation.[159]

## V. COMPARISON OF TWO PROPOSALS

As noted in Part II of this note, the doctrine of patent exhaustion ends the patent holder's right to control the downstream use, modification, discarding, re-selling, or ordinary repair of the patented device, including the patented invention where the patent holder unconditionally sells the patented article. One argument in favor of patent exhaustion is that it mitigates some of the more unfortunate results of intellectual property's policy of granting monopoly rights to patent holders as an incentive to innovate.[160] In balancing the competing interests of patent and antitrust laws in the context of innovation, there are few proposals that have been suggested by scholars in the particular example of patented seed, self-replicating technology.

### *A. Three-Part Test to Determine Permissible Uses*

Professor Daryl Lim proposes a technology-neutral, three-part test to determine what is a permissible "use" and what is an impermissible "making" of patented articles.[161] Professor Lim's three-part test was based on the United Kingdom Supreme Court case of Schütz v. Werit. In the *Schütz* case, the court articulated a framework for what constitutes an impermissible "making."[162] The three-part test begins with an interpretation of "making." The *Schütz* court held that "making" should be interpreted "by reference to the facts of the particular case and should be sufficiently clear and certain for patentees and others."[163] Next, the interpretation should balance protecting the patentee's monopoly interest with the public's interest in reasonable competition.[164] Finally, a determination of permissible makings of patented articles should consider the party that carries out the work involved.[165]

In the first factor of the three-part test, the Supreme Court has held that a

INTELLECTUAL PROPERTY RIGHTS: PROMOTING INNOVATION AND COMPETITION 1 (2007), http://www.justice.gov/atr/public/hearings/ip/222655.pdf.

159. *See generally* Anne K. Bingaman, Asst. Att'y Gen., U.S. Dep't of Justice, Antitrust Div, Address at the Stanford Law School Program on Antitrust and Intellectual Property (Oct. 7, 1994), http://www.justice.gov/atr/public/speeches/0116.htm.

160. *See* JOHNATHAN CURCI, THE PROTECTION OF BIODIVERSITY AND TRADITIONAL KNOWLEDGE IN INTERNATIONAL LAW OF INTELLECTUAL PROPERTY 218 (2010).

161. Daryl Lim, *Self-Replicating Technologies and the Challenge for the Patent and Antitrust Laws*, 32 CARDOZO ARTS & ENT. L.J. 131, 163 (2013).

162. *Id.* at 170.

163. *Id.*

164. *Id.*

165. *Id.* at 170-71.

term in the Patent Act is presumed to have its "ordinary, contemporary, [and] common meaning," absent some contrary indication.[166] Professor Lim pointed out that the ordinary meaning of "making" includes the creation of new articles– including the production of new soybeans through various farming techniques.[167] Therefore, Bowman's planting and harvesting of the second harvest soybean seeds with the Roundup Ready resistant trait constitutes the "making" of the Monsanto's Roundup Ready resistant seeds.

The second factor of the three-part test recognizes a balance of monopoly and market competition.[168] The Supreme Court has required the consideration of the patent's inventive concept in order to preempt future innovation and hamper innovation and competition.[169] It is clear that Monsanto has a valid patent for the Roundup Ready resistant seed technology; however, it can be argued that Monsanto is protecting its primary market by creating an unfair market leverage in preventing farmers from replanting seeds with the Roundup Ready resistant gene.[170] Professor Lim argues that the proper balancing here is to permit farmers to only plant the Roundup seeds once.[171] That way, Monsanto is rewarded for its innovation while farmers benefit from the Roundup seeds. The third factor is relatively straightforward in the case of patented seeds. The farmer is always the party that carries out the work involved, since the seeds would not germinate without the farmer's planting and cultivating of the seeds. Thus, under Professor Lim's three-part approach, the exhaustion doctrine should not apply against Monsanto here.[172]

Professor Lim's three-part test approach is logical, straightforward, and seems that it would produce consistent results in similar cases. As Professor Lim pointed out, the second factor of balancing monopoly and market competition turns on whether the patent holder's method of structuring its means of appropriation is the *least restrictive* option available to promote technological progress.[173] This approach falls in-line with antitrust law, but it doesn't fully explain the incentive for innovation that patent law aims to protect. This Note argues that the

166. Bilski v. Kappos, 561 U.S. 593, 594 (2010); Diamond v. Diehr, 450 U.S. 175, 182 (1981).

167. *See, e.g.*, WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY 1363 (3d ed. 2002). One meaning of "make" is "to plant and raise (a crop)." *Id.*

168. Lim, *supra* note 160, at 175.

169. *See* Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S. Ct. 2107, 2117 (2013) (stating that "[g]roundbreaking, innovative, or even brilliant discovery does not itself satisfy the" [patent requirements found in 35 U.S.C. § 101 (2012)]).

170. *See* Lim, *supra* note 161, at 176.

171. *See id.*

172. *See id.* at 178.

173. *Id.* at 177.

better approach to balancing the innovation and competition principals of patent and antitrust law, is for courts to adopt a rule of considering the application of those policies on a case-by-case basis. Professor Jeremy Sheff proposed that the applicability of the exhaustion defense should depend on what he classifies as a "*fear of substitution*."[174]

### *B. Analysis of the "Perfect Substitutes" Proposal for First Generation Embodiments*

When the patent involves self-replicating technology, Professor Sheff's approach to setting the scope of exhaustion doctrine recognizes the fear that the downstream "use" in question may have the ability to affect a patent holder's capacity to charge supracompetitive prices for its patent.[175]

The threat that is inherent in self-replicating technology is unique, because of the self-replication's ability to reproduce *perfect* embodiments in subsequent generations.[176] Typically, when downstream users are able to make copies of a patented article, the copies are not going to be perfect substitutes for the patented article.[177] For example, the copied articles may be less functional, of less quality, or not quite of the same technology due to the patent protection conferred to the patent holder.[178] Therefore, perfect substitutes are unlikely. Conversely, in self-replicating examples where the patented article is so readily interchangeable, perfect market substitutes will likely have a substantial negative impact on the patent holder's ability to charge supracompetitive prices (and will in-turn lower the incentive to take on the costs and risks of innovation).[179] If the downstream user is able to produce perfect copies of the patented article, soon there will be no need for others to go to the patent holder to purchase the patented article.

Opposition to this approach may argue that patent holders will always claim that downstream uses will have a negative effect on their ability to charge supracompetitive prices. This might be true, but that does not mean that patent holders will generally be able to prevail on this assertion alone. Professor Sheff correctly distinguished between two hypothetical examples,[180] stating "not all patents for self-replicating technologies will necessarily be 'eviscerated' should a purchaser of one embodiment use it without restriction to generate more."[181] For example, Professor Sheff offered the example of self-replicating technology in

174. Sheff, *supra* note 43, at 250.
175. *Id.*
176. *Id.*
177. *Id.* at 250-51.
178. *Id.* at 251.
179. *See id.* at 253.
180. *Id.* at 249-50.
181. *Id.* at 249.

personal medicine cases.[182] In this example, *n*th-generations of vectors for cancer gene-therapy are actually poor substitutes, because patients' diseases and immune systems might be vastly different, calling for more individualized treatment.[183] In closing, the burden should be on the patent holder to show that the downstream uses truly have a negative effect on its ability to charge supracompetitive prices, and it should be up to the courts to make the judgment of when this "fear of evisceration" is material.

Professor Sheff's approach to patent exhaustion of self-replicating technology captures the differences when patent exhaustion is warranted to reflect comprehensive, innovative, and competitive policies. The Perfect Substitutes consideration appropriately draws attention to the fact that perfect *n*th-generation embodiments "will swiftly cannibalize the market for first-generation embodiments" if the anti-monopolistic practices continue unrestricted.[184] This is the better approach, because it clearly articulates the unique threat that is not necessarily present in other forms of market competition. Patent's exhaustion doctrine is a powerful tool for reducing the patent holder's market power by enabling substitutes. However, when dealing with self-replicating technologies that can produce perfect substitutes, the exhaustion doctrine should not apply in a way that squeezes the patent holder out of the market.

## VI. CONCLUSION

In patents involving self-replicating technology, antitrust laws expect that certain license arrangements between competitors or conduct by monopolies prevent consumers from enjoying the benefits of the technology. Patent and antitrust laws often conflict, with the interest of promoting innovation as their natural overlap. In order to efficiently promote this common interest, the law should establish a rule of considering the application of those policies on a case-by-case basis where applicability of patent exhaustion is determined by the ability of downstream users to create perfect substitutes of the patented article containing the patented invention. The Supreme Court of Canada and the United States Supreme Court came to a similar outcome, holding that the farmers in each case had infringed Monsanto's Round Ready resistant seed patent.[185]

The U.S. Supreme Court conservatively limited its holding to address the

182. *Id.*

183. *See id.*; Charlotte Dalba et al., *Replication-Competent Vectors and Empty Virus-Like Particles: New Retroviral Vector Designs for Cancer Gene Therapy or Vaccines*, 15 MOLECULAR THERAPY 457 (2007).

184. Sheff, *supra* note 43, at 250.

185. *See* Monsanto Can. Inc. v. Schmeiser, 2004 SCC 34, [2004] 1 S.C.R. 902; Bowman v. Monsanto Co., 133 S. Ct. 1761 (2013).

*Bowman* case,[186] perhaps appropriately recognizing that there likely will be self-replicating products that pose more complex and diverse issues than seeds with desirably resistant genes. Such complex issues are beyond the scope of this Note. But ultimately, the issue of the scope of patent exhaustion doctrine appears to be a recurring question that will be implicated by litigation involving downstream uses of patented articles that involve self-replicating technology. Rather than setting the boundaries of exhaustion doctrine by technology neutral classifications, an assessment of downstream users' ability to create perfect substitutes better evaluates patent principles of promoting innovation by providing protection for inventors of new technologies, and antitrust law's policies of promoting innovation by focusing on how conduct effects market competition.

186. *Bowman*, 133 S. Ct. at 1769.