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Comment: Legal Ownership of Plant Genetic Resources—Fewer Options for Farmers

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CASENOTES AND COMMENTS

LEGAL OWNERSHIP OF PLANT GENETIC RESOURCES - FEWER OPTIONS FOR FARMERS

I. INTRODUCTION

In the world today, we are just beginning to realize the incredible resources hidden in the wealth of plant life around the world.[1] Humans can only reap benefits from this resource if the biological diversity[2] of plants is protected. In the medical field, plants may provide treatments or even cures for conditions and diseases for which drugs are currently ineffective.[3] Plants may also provide solutions to environmental problems with waste disposal, through the development of biodegradable packaging and packing materials.[4] While plants show great promise for advances in both of these areas, biological diversity is most important when it comes to agriculture. Biological diversity in agriculture provides for heartier crops which will grow in parts of the world with inferior land.[5] The utilization of plants which are not indigenous to an area but are capable of thriving there can play a large role in reducing world hunger.[6] Biological diversity in plants also may allow for the development of crops resistant to both pests and weeds.[7] Resistant plants will reduce the need for pesticides and herbicides which cause a number of problems, including considerable water pollution.[8] Finally, increased biological diversity means a greater variety of available crops which allows for crop rotation and better soil quality.[9] Considering the numbers of uses for plant material, protecting plant biodiversity on a worldwide basis is a desirable goal.

In spite of the many benefits of protecting plant biological diversity at a global level, the United States refused to sign the Convention on Biological

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1. There are about 300,000 flowering-plant species, 10,000 fern species, and 40,000 fungi in existence. GREEN PLANET: THE STORY OF PLANT LIFE ON EARTH 26 (David M. Moore ed., 1982).

2. Biological diversity refers to the full range of variety and variability within and among living organisms and the ecological complexes in which they occur. This is the definition used in the Biological Diversity Convention. *See infra* note 14.

3. For example, the Pacific Yew Tree which grows in limited areas of California has shown promise as a treatment of breast cancer. *See* Sandy Rovener, *The Cutting Edge - Two Labs Produce Synthesized Taxol*, WASH. POST, Feb. 15, 1994, at Z5. Because of their potential medicinal value, plants in the Amazon rain forests are the focus of research by doctors worldwide. *See* Andrew Pollack, *Drug Industry Going Back to Nature*, N.Y. TIMES, Mar. 5, 1992, at D1.

4. Plants play an important role in industry, often providing the raw materials used in production of ordinary products. June Starr & Kenneth C. Hardy, *Not by Seeds Alone: The Biodiversity Treaty and the Role for Native Agriculture*, 12 STAN. ENVTL. L.J. 85, 92 (1993).

5. *Id.*

6. *Id.*

7. Agriculture is the largest contributor to non-point water pollution because of the extensive use of fertilizer, herbicides, and pesticides. *See* Linda A. Malone, *Reflections on the Jeffersonian Ideal of an Agrarian Democracy and the Emergence of an Agricultural and Environmental Ethic in the 1990 Farm Bill*, 12 STAN. ENVTL. L.J. 3, 4 (1993).

8. *Id.*

9. Crop rotation mitigates weed, disease, and pest problems; increases soil nitrogen and reduces the need for purchased fertilizers. *See* James Stephen Carpenter, *Farm Chemicals, Soil Erosion, and Sustainable Agriculture*, 13 STAN. ENVTL. L.J. 190, 222 (1993).

Diversity[10] at the United Nations Conference of Environment and Development (popularly known as the Earth Summit) held in Rio de Janeiro in June 1992.[11] Virtually every industrialized nation in attendance at the conference, including Germany, Japan and France, signed the treaty.[12] The United States was the only country which refused.[13] Following the order of then President George Bush, the United States refused to sign the convention because certain articles contained potential conflicts with intellectual property rights.[14]

The United States' refusal first to sign and then to ratify the Convention because of United States intellectual property law raises two questions. First, considering the importance of biological diversity in agriculture, who should own and control plant genetic resources? Second, what are the national and global ramifications of such ownership and control? This Comment will begin by tracing United States intellectual property law as it affects plants in order to demonstrate the rights that accompany ownership of a plant patent. Specifically, this section will examine the Plant Variety Protection Act,[15] the United States statute which governs plants and intellectual property nationwide. Next, to demonstrate the international perspective on the ownership of plant genetic resources, this Comment will examine the Union for the Protection of New Varieties of Plants, the most influential international body governing intellectual property rights and plants.[16] This Comment will then analyze the effects of legal principles regarding ownership of plant genetic resources on the seed industry, United States farmers and the international community. Finally, this Comment will make proposals for the protection of plant biodiversity, which continue to recognize the intellectual property rights of patent holders.

II. UNITED STATES INTELLECTUAL PROPERTY LAW REGARDING PLANTS

A. A General Overview of Patent Law and the Effects of Diamond v. Chakrabarty

1. Intellectual Property Law in the United States and Its Basic Features

The ability to patent originates in the Constitution. Article I, Section 8 grants Congress the power to legislate to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclu-

10. The Convention provides for the monitoring of biological diversity, the development of national strategies for conservation, environmental impact assessments and the sharing of knowledge. *See* Edith B. Weiss, *Introductory Note, United Nations Conference on Environment and Development*, 31 INT'L LEGAL MATERIALS 814, 817 (1992) [hereinafter *United Nations Conference*].

11. From June 3 - 14, 1992, representatives from more than 170 countries met to focus on sustainable development and its environmental implications. *Id.* at 814.

12. *See* Michael Unger, *Clinton Favors Biodiversity Pact*, NEWSDAY, Apr. 16, 1993, at 17.

13. *Id.* However, in 1993, at the behest of President Clinton, United Nations Ambassador Madeline Albright signed the Convention at a brief ceremony at the United Nations. *U.S. Signs Agreement on Biological Diversity*, REUTERS, June 5, 1993, at A7 [hereinafter *U.S. Signs*]. Unfortunately, the Senate recessed without ratifying the treaty by its deadline. The Convention thus remains unratified. Howard G. Buffet, *Nothing to Fear from Biodiversity*, WASH. POST, Sept. 4, 1994, at C7.

14. *See United Nations Conference on Environment and Development: Convention on Biological Diversity*, arts. 15-19, 31 INT'L LEGAL MATERIALS 818, 828-30 (1992) [hereinafter *Biological Diversity Convention*].

15. 7 U.S.C. §§ 2321-2582 (1988).

16. *See* International Convention for the Protection of New Varieties of Plants, Oct. 23, 1978, 33 U.S.T. 2703 (1988) [hereinafter Protection of New Varieties of Plants].

sive Right to their respective Writings and Discoveries."[17] Essentially, a patent is a privilege "granted to an inventor as a reward for his contribution to 'science and the useful arts' in making his invention and disclosing it to the public."[18] However, the patent privilege does not grant the holder the exclusive right to use, make or sell his invention; it only prevents others from doing so without the patent holder's consent.[19]

Congress enacted the first patent laws in the United States in 1790.[20] Today, patents are under the jurisdiction of the Patent and Trademark Office (PTO) which is part of the Department of Commerce.[21] The PTO maintains a staff of 1850 patent examiners, all of whom hold degrees in engineering or science and many of whom also hold law degrees.[22] In 1993, the PTO received approximately 188,000 patent applications and granted more than 100,000 patents.[23] The average application pendency time is between eighteen and twenty-four months.[24]

Virtually anyone, regardless of age, sex, or citizenship may receive a patent.[25] However, only the true inventor may apply for and receive the patent.[26] The inventor may, and often does, assign his patent rights in order to garner the resources for selling, marketing or producing the invention.[27] Finally, when an employee invents something on the job, the employer generally has rights to the invention.[28]

While anyone can receive a patent, not everything is patentable. Section 101 of the Patent Code states that patents may be granted on any "new and useful process, machine, manufacture, composition of matter, or any new and useful improvement thereof."[29] Conversely, laws of nature, physical phenomena, and abstract ideas are not patentable.[30] Therefore, "a new mineral discovered in the earth or a new plant found in the wild is not patentable subject matter."[31] Because living organisms developed by scientists did not fit into either the description of things which were patentable or that of things which were not, the Supreme Court had to decide how to treat living organisms in

17. U.S. CONST. art. I, § 8, cl. 8. Congress exercises this authority in the hope that "the productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes of manufacture into the economy, and the emanations by way of increased employment and better lives for citizens." Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 480-81 (1974).

18. Gregory J. Lavorgna, *An Overview of the U.S. Patent System*, *in* FUNDAMENTALS OF PATENT LAW AND PRACTICE, 1, 4 (1994).

19. *Id.* at 5.

20. RICHARD WINCOR & IRVING MANDELL, COPYRIGHT, PATENTS AND TRADEMARKS: THE PROTECTION OF INTELLECTUAL AND INDUSTRIAL PROPERTY 41 (1980).

21. *Id.*

22. AL LAWRENCE SMITH, *Patent Examination in the U.S. Patent and Trademark Office*, *in* FUNDAMENTALS OF PATENT LAW AND PRACTICE 27, 29 (1994).

23. *Id.* Charles Duell, the Commissioner of Patents in 1899 was apparently wrong when he recommended that President McKinley abolish the patent office because "[e]verything that can be invented has been invented." Lavorgna, *supra* note 18, at 3.

24. *See* SMITH, *supra* note 22, at 29.

25. WINCOR & MANDELL, *supra* note 20, at 51.

26. WINCOR & MANDELL, *supra* note 20, at 51.

27. WINCOR & MANDELL, *supra* note 20, at 52.

28. WINCOR & MANDELL, *supra* note 20, at 56.

29. *See* 35 U.S.C. § 101 (1988)

30. *See* Parker v. Flook, 437 U.S. 584 (1978); Gottshalk v. Benson, 409 U.S. 63 (1972); Funk Brothers Seed Co. v. Kalo Inoculant Co., 333 U.S. 127 (1948).

31. Diamond v. Chakrabarty, 447 U.S. 303, 308 (1980).

Diamond v. Chakrabarty.[32]

2. Diamond v. Chakrabarty

In 1980, the Supreme Court issued its opinion in *Diamond v. Chakrabarty.*[33] In rendering its decision, the Court interpreted, for the first time, section 101 of the Patent Code[34] regarding the patenting of a living organism other than a plant.[35]

Chakrabarty was a microbiologist for General Electric Company.[36] He had developed a bacterium through genetic engineering which was capable of breaking down multiple components of crude oil and which was potentially helpful in control of oil spills.[37] The patent examiner allowed patent claims for the method of producing the bacteria and the process for application of the bacteria, but rejected the claim for patenting the bacteria itself.[38] The patent examiner's decision rested on the grounds that microorganisms are "products of nature" and as living things are not patentable subject matter.[39] Chakrabarty appealed to the Patent Office Board of Appeals, which affirmed that the bacterium was not patentable because it was a living thing.[40] Once again Chakrabarty appealed, this time to the Court of Customs and Patent Appeals.[41] The panel for the Court of Customs and Patent Appeals reversed the previous decisions on the authority of its holding in *In re Bergy.*[42] In that case, the court held that "the fact that microorganisms . . . are alive . . . [is] without legal significance."[43]

The Supreme Court affirmed the decision of the Court of Customs and Patent Appeals, holding that unless or until Congress specifically addresses the issue of patenting living organisms, any creation produced through the handiwork of the scientist rather that the handiwork of nature is patentable subject matter.[44] As a result, any engineered form of plant or even animal may be subject to an intellectual property law claim.[45]

3. The Lasting Effects of Diamond v. Chakrabarty

Diamond has had two major effects on intellectual property law. First, organisms which are much more complex than the bacteria at issue in the case are now routinely patented. Second, plant breeders, as a result of a later deci-

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32. *See infra* notes 33-45 and accompanying text.
33. 447 U.S. 303 (1980).
34. Section 101 provides: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter . . . may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101 (1988).
35. *Diamond*, 447 U.S. at 305.
36. *Id.* at 304.
37. *Id.* at 305.
38. *Id.* at 306.
39. *Diamond*, 447 U.S. at 306.
40. *Id.* at 306 n.3. The Board did not consider the bacterium a product of nature because the bacterium was not naturally occurring.
41. *Id.* at 306.
42. *Id.* (citing *In re* Bergy, 563 F.2d 1031, 1038 (C.C.P.A. 1977)).
43. *Diamond*, 447 U.S. at 306.
44. *Id.* at 318.
45. *Id.* at 313.

sion based on *Diamond*, have yet another means of protection for the results of their research in addition to the intellectual property laws enacted specifically for plants.[46]

In 1987 the Board of Patent Appeals opened the door for patenting life forms larger than bacteria when it ruled that polyploid oysters were patentable subject matter.[47] In a subsequent statement, the PTO announced that it would consider all non-naturally occurring, nonhuman, multicellular living organisms, including animals, as patentable subject matter.[48] One year later, the PTO issued the first patent for a complex animal to Harvard University for a mouse which had been genetically engineered to be extremely susceptible to cancer.[49] In addition to granting patents for genetically engineered life forms, the PTO has also granted patents on the processes used to create new animal life.[50] In fact, human beings are the only potential biological subject matter which may not be patented.[51]

In addition to providing the basis for the patenting of animals, *Diamond* also provided the basis for granting utility patents for plants.[52] Utility patents protect the mechanism for producing the patentable subject matter.[53] In *Ex parte Hibberd*,[54] the PTO relied on *Diamond* in its decision to grant plant breeders utility patents on newly developed (genetically engineered) plants.[55] Thus far, the PTO has granted hundreds of patents for plant varieties produced through genetic engineering.[56]

While *Diamond* greatly expanded the number of subjects for patentability, the ability to patent plants already existed. Both the Plant Patent Act of 1930[57] and the Plant Variety Protection Act of 1971[58] provided intellectual property protection for breeders of novel plant varieties.

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46. Plant breeders can obtain patent protection for plants under the Plant Patent Act of 1930 and the Plant Variety Protection Act (PVPA). *See* 35 U.S.C. § 101 (1988), *infra* notes 59-67 and accompanying text; 7 U.S.C. §§ 2321-2582, *infra* notes 68-82 and accompanying text.

47. *See Ex parte* Allen, 2 U.S.P.Q.2d (BNA) 1425 (PTO Bd. Pat. App. & Int. 1987).

48. Kevin W. O'Connor, *Patenting Animals and Other Living Things*, 65 S. CAL. L. REV. 597, 607 (1991).

49. *Id.* The mouse is a transgenic animal which means scientists have added DNA from humans or other animals to the animal's hereditary DNA. *See* Reagan Anne Kulseth, Note, *Biotechnology and Animal Patents: When Someone Builds a Better Mouse*, 32 ARIZ. L. REV. 691, 695 (1990). There is a huge potential for studying cancers which occur exclusively in humans by reproducing the cancer in animals. *Id.*

50. CHRISTINE E. CARTY, *Biotechnology Patent Applications, in* FUNDAMENTALS OF PATENT LAW AND PRACTICE 197, 200 (1994).

51. *Id.* Patenting of human beings would violate the Thirteenth Amendment to the Constitution which bars slavery and involuntary servitude. *See* O'Conner, *supra* note 48, at 620. However, products resulting from experimentation on human body parts are patentable. *See* Moore v. Regents of the University of California, 793 P.2d 479 (Cal. 1990). In *Moore*, the California Supreme Court held that a patient could not sue a doctor for conversion when the doctor developed and patented a valuable cell line from the patient's body tissue without the patient's consent. *Id.* at 497.

52. Neil D. Hamilton, *Why Own the Farm If You Can Own the Farmer (and the Crop)?: Contract Production and Intellectual Property Protection of Grain Crops*, 73 NEB. L. REV. 48, 91 (1994).

53. A utility patent as one which is "issued to any novel, non-obvious, and useful machine, article of manufacture, composition, and matter or process." BLACK'S LAW DICTIONARY 1125 (6th ed. 1990).

54. 227 U.S.P.Q. (BNA) 443 (PTO Bd. Pat. App. & Int. 1985).

55. *Id.*

56. Hamilton, *supra* note 52, at 91. Recently, a Wisconsin based company announced that it had received a patent for "all genetically engineered cotton" thus ensuring that all such cotton products would have to be licensed through them before they could enter the market place. *See* Hamilton, *supra* note 52, at 91.

57. *See infra* notes 59-67 and accompanying text.

58. *See infra* notes 68-82 and accompanying text.

B. The Plant Patent Act of 1930

Until 1930, one could not patent a plant.[59] Plants were excluded from patent law for two reasons. First, plants are products of nature.[60] Second, plants were not thought to be amenable to the written description requirement of patent law.[61]

As a result of lobbying efforts by the seed industry, the United States first recognized plants as patentable in the Plant Patent Act of 1930.[62] Patents were limited, however, to plants which were reproduced asexually.[63] The rationale for restricting protection to asexually reproduced plants was the belief that new plant varieties could not be reproduced reliably by seed.[64]

The requirements for patenting plants under the 1930 Act, which is still in effect today, are that the variety be distinct (having characteristics that are clearly distinguishable from those of existing varieties), new (variety has not previously existed), and nonobvious (sufficiently different from previous varieties so as not to be obvious at the time of invention to someone having ordinary skill in the art).[65] Before consideration of the application for a plant patent, it was important that the plant had actually been asexually reproduced.[66] Finally, the new variety must have utility which means the variety must serve some specific purpose.[67]

C. Plant Variety Protection Act

As technology for identifying different characteristics of plants grew, plant researchers and developers began demanding patent protection for plants they "discovered."[68] Their demands resulted in the enactment of the Plant Variety Protection Act of 1971 (PVPA) which extended patent protection to new plant varieties which are produced sexually.[69] The purpose of the PVPA is "to encourage the development of novel varieties of sexually reproduced plants and to make them available to the public, providing protection available to those who

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59. *See Diamond*, 447 U.S. at 311.

60. The Commissioner of the patent office in *Ex parte* Latimer, 46 Off. Gaz. Pat. Office 1638 (1889), in rejecting a patent application for fiber found in a pine needle, reasoned that the patenting of the trees of the forests and the plants of the earth would be unreasonable. *Id.* at 1641.

61. *See* 35 U.S.C. § 112 (1988). Before the modern advances in genetics, new plants were thought to differ from old plants only in color or perfume. Therefore, a clear written description was often impossible due to differences in human perception. *See Diamond*, 447 U.S. at 312.

62. *See* 35 U.S.C. §§ 161-164 (1988) which provides in relevant part: "Whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings . . . may obtain a patent therefor." 35 U.S.C. § 161. The Plant Patent Act was incorporated into the Patent Act in 1952. 35 U.S.C. § 101 (1988).

63. Asexually reproducing plants are those reproduced through grafting, cuttings, or bulbs as opposed to sexually reproducing plants which reproduce using seeds. Frederick H. Buttel & Jill Belsky, *Biotechnology, Plant Breeding, and Intellectual Property: Social and Ethical Dimensions, in* OWNING SCIENTIFIC AND TECHNICAL INFORMATION, VALUE AND ETHICAL ISSUES 110, 120 (Vivian Weil & John W. Snapper eds., 1989) [hereinafter Buttel & Belsky].

64. *Id.*

65. *Id.* at 121.

66. *Id.*

67. *Id.* One difference between the requirement for a plant patent and a utility patent (one for an invention) is the requirement regarding a written description. For utility patents, the patented object must be described completely enough "to enable any person skilled in the art . . . to make and use the same." 35 U.S.C. § 112 (1988). For plant patents, the requirement is that the plant description be "as complete as reasonably possible." 35 U.S.C. §§ 161-162 (1988). This modification answered the objection to plant patents that plants are not amenable to a complete written description. *See supra* note 61.

68. H.R. REP. NO. 1605, 91st Cong., 2d Sess., 84 Stat. 1542 (1970), *reprinted in* 1970 U.S.C.C.A.N. 5082, 5083.

69. 7 U.S.C. §§ 2321-2402 (1988).

breed, develop, or discover them, and thereby promoting progress in agriculture in the public interest."[70]

The United States Department of Agriculture administers the PVPA, instead of the Patent Office, which administers the patent process for asexually reproducing plants covered by the Plant Patent Act.[71] Also, under the PVPA, "certificates of protection" are issued to "breeders" while under the Plant Patent Act, "patents" are granted to "inventors."[72] To be eligible for protection under the PVPA, a plant must meet three requirements.[73] First, the plant must be a novel variety.[74] Second, before consideration of the patent application, the plant variety must be sexually reproduced.[75] Third, the applicant for the patent must provide a description which is as "complete as possible" and which also includes breeding procedures and genealogy.[76] In addition to meeting these requirements, the applicant must make a deposit of the seed for viability testing.[77] Finally, the PVPA also includes a research exemption which permits the use of protected varieties by competing companies.[78] Therefore, another seed developer or company may use varieties protected under a PVPA certificate for "bona fide" research without fear of a suit for infringement, while the individual farmer may not.[79]

Since its passage in 1970, the USDA has issued over 2000 PVPA certificates.[80] One of the main attractions the PVPA holds for plant breeders is that the breeders themselves can complete the applications for certificates of protection without the services of a patent attorney.[81] Because the PVPA is cost effective and user-friendly, it has played a significant role in increasing seed breeding in the private sector.[82]

1. The Farmers' Exemption to the PVPA

The PVPA addresses the availability of crops for farmers in the section known as the "Farmers' Exemption" or the "crop exemption," which states:

> [It] shall not infringe any right hereunder, for a person to save seed produced by him from seed produced by him from seed obtained, or descended from seed obtained, by authority of the owner of the variety for seeding purposes and use such saved seed in the production

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70 H.R. REP. NO. 1605, 91st Cong., 2d Sess., 84 Stat. 1542 (1970), *reprinted in* 1970 U.S.C.C.A.N. 1793.

71. *See* Buttel & Belsky, *supra* note 63, at 121. It is likely that the Department of Agriculture administers the PVPA because crops, rather than flowers or garden produce, are the focus of the PVPA. *See infra* note 141.

72. Buttel & Belsky, *supra* note 63, at 121.

73. Buttel & Belsky, *supra* note 63, at 122.

74. A novel variety is one that is distinct, uniform and stable. Uniformity and stability refer to the need for the variety to reproduce itself true to type. Buttel & Belsky, *supra* note 63, at 122.

75. Buttel & Belsky, *supra* note 63, at 122.

76. Buttel & Belsky, *supra* note 63, at 122.

77 Buttel & Belsky, *supra* note 63, at 122.

78. Independent development is considered unlikely and would be grounds for claiming infringement of a PVPA protected variety. 7 U.S.C. § 2544 (1988).

79. *See* Hamilton, *supra* note 52, at 95.

80. *See* Hamilton, *supra* note 52, at 95.

81. *See* Hamilton, *supra* note 52, at 95.

82. *See* Hamilton, *supra* note 52, at 95.

of a crop for use on his farm, or for sale as provided in this section.[83]

This exemption allows farmers who are not in the business of selling seed for reproductive purposes to save seed to plant the next season or to sell to other farmers for the same purpose.[84] The language "as provided for in this section"[85] refers to section 2541 of the PVPA, which enumerates eight acts which infringe a certificate owner's rights.[86] A corresponding prohibition in the PVPA which affects farmers who sell seed under the Farmers' Exemption prohibits growing crops for seed as part of a scheme for marketing that seed.[87] Section 2541(3) prohibits the farmer from sexually multiplying the novel variety as a step in marketing the variety for growing purposes.[88] Therefore, a farmer may sell some of his crop to another farmer for seeding purposes but he may not "market" his seed.[89]

Finally, there are other limitations within the Farmers' Exemption to the PVPA. One is that any sale of saved seed must be to another farmer whose primary farming occupation is growing crops for consumption or feed (as opposed to growing crops for reproductive purposes).[90] Sales of saved seed must also be in compliance with state law.[91]

The Farmers' Exemption appears to provide farmers with ample opportunity to save seed from their crops to sell to other farmers. However, in a recent decision, the Supreme Court sharply curtailed the ability of farmers to do just that, by interpreting the Farmers' Exemption to the PVPA very narrowly.[92]

2. *Asgrow v. Winterboer*

On January 18, 1995, the Supreme Court issued a decision interpreting the Farmers' Exemption and the prohibition regarding planting seed as a step in marketing in *Asgrow Seed Co. v. Winterboer*.[93] The decision in *Asgrow* is the first Supreme Court interpretation of the Farmers' Exemption to the PVPA.[94]

Asgrow Seed Co., which is a subsidiary of Upjohn, brought this action.[95] Asgrow is in the business of developing agricultural seed and selling it to farmers.[96] The Winterboers are family farmers living in northwestern Iowa.[97] The

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83. 7 U.S.C. § 2543 (1988).
84. *Id.*
85. *Id.*
86. The prohibited acts include selling, importing, producing hybrids, and dispensing the seeds without notice that they are a protected variety. *See* 7 U.S.C. § 2541(1)-(8) (1988).
87. 7 U.S.C. § 2541(3) (1988).
88. *Id.*
89. The PVPA does not define "marketing." The definition is crucial to the effect of the Farmer's Exemption and played a major role in the Supreme Court's decision in *Asgrow v. Winterboer*, *infra* notes 93-128 and accompanying text.
90. *See* 7 U.S.C. § 2543, *supra* text accompanying note 83.
91. *See* 7 U.S.C. § 2543, *supra* text accompanying note 83.
92. *See infra* notes 117-128 and accompanying text.
93. 115 S. Ct. 788 (1995).
94. *Id.* at 790.
95. Asgrow Seed Co. v. Winterboer, 795 F. Supp. 915, 916 (N.D. Iowa 1991), *rev'd*, 982 F.2d 486 (Fed. Cir. 1992), *rev'd*, 115 S. Ct. 788 (1995).
96. *Id.*
97. *Id.*

plaintiff seed company alleged that the defendants were selling seeds to other farmers for planting using a process known as "brown-bagging."[98] Brown-bagging is a process in which a farmer purchases seed from the developer, plants the seed, harvests it, cleans it, and places it in a non-descriptive brown bag for sale.[99] Asgrow alleged that the Winterboers were infringing upon Asgrow's certification under the PVPA by engaging in unauthorized selling,[100] sexually multiplying the varieties as a step in marketing the varieties,[101] and dispensing seeds in a form which can be propagated without notice as to being a protected variety.[102] The Winterboers did not dispute that they sold the progeny of the novel variety belonging to Asgrow.[103] In their defense, they argued that they were exempt from the infringement claim under the Farmers' Exemption of the PVPA.[104]

The matter came before the United States District Court for the Northern District of Iowa after both parties moved for summary judgment.[105] The court granted Asgrow's motion and granted a permanent injunction enjoining the Winterboers from selling any more seed.[106] In his opinion, Judge O'Brien relied on a Fifth Circuit Court of Appeals decision which held that the Farmers' Exemption to the PVPA should be interpreted narrowly.[107] The district court also held that the amount of seed a farmer could save under the Farmers' Exemption is limited to the amount necessary to sow the number of acres the farmer wishes to plant in the upcoming crop year.[108] That is the maximum amount the farmer can sell to another farmer.[109]

The Winterboers appealed the district court's decision to the United States Court of Appeals for the Federal Circuit.[110] On appeal, interested parties submitted twelve briefs of *amici curiae* in support of the seed company.[111] The court of appeals held that the district court erred in reading a quantitative crop limitation into the crop exemption of the PVPA, finding that the only limitations

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98. *Id.*
99. *Id.*
100. *See* 7 U.S.C. § 2541(1) (1988).
101. *See* 7 U.S.C. § 2541(3).
102. *See* 7 U.S.C. § 2541(6) (1988); *Asgrow*, 795 F. Supp. at 916-17.
103. *Asgrow*, 795 F. Supp. at 917.
104. *Id.*
105. *Id.* at 916.
106. *Id.* at 920.
107. In Delta & Pine Land Co. v. People Gin Co., the Fifth Circuit reasoned:
> [T]he broader the construction given the exemption, the smaller the incentive for breeders to invest the substantial time and effort necessary to develop new strains. The less time and effort that is invested, the smaller the chance of discovering superior agricultural products. If less time and effort is invested, long-term benefits to the farmer in the form of superior crops and higher yields will be lost.

694 F.2d 1012, 1017 (5th Cir. 1983).
108. *Asgrow*, 795 F. Supp. at 920.
109. *Id.*
110. *See* Asgrow Seed Co. v. Winterboer, 982 F.2d 486 (Fed. Cir. 1992), *reh'g denied*, 989 F.2d 478 (Fed. Cir. 1993), *rev'd*, 115 S. Ct. 788 (1995). Before the appeal, plaintiffs filed a motion for clarification regarding a possible discrepancy between two footnotes in the court's opinion. The district court granted this motion and made a clarification stating that a violation of state law is not necessary for a violation of the labelling section of the PVPA, 7 U.S.C. § 2541(6) to occur. *See Asgrow*, 795 F. Supp. at 920.
111. Such organizations as the American Seed Trade Association, Northrup King, Upjohn and Monsanto filed amicus briefs. *Asgrow*, 982 F.2d at 487. As the lone dissenter in the motion for rehearing of the appeal *en banc* noted, "[t]he twelve briefs of amici curiae apparently represent[ed] the entire seed industry." *Asgrow*, 989 F.2d at 479.

on how much a farmer can save are those which appear in the statute.[112] Those limitations are that (1) the seed saved, used or sold, was obtained by the authority of the owner of the variety for seeding purposes; (2) sales are made only to other farmers (as opposed to stores or cooperatives); (3) the primary occupation of the seller and buyer is growing crops for feed or consumption rather than reproductive purposes; and (4) the seller is subject to infringement for "marketing" or producing a hybrid.[113] The court then discussed the fact that, while farmers can make certain defined brown bag sales without the threat of infringement, farmers cannot "market" the novel varieties.[114] The court interpreted marketing to mean extensive or coordinated selling activities, such as advertising or using an intervening sales representative.[115] Subsequently, the court reversed the district court's grant of Asgrow's motion for summary judgment and remanded the case to trial.[116]

Asgrow appealed the decision of the Court of Appeals for the Federal Circuit and the Supreme Court granted certiorari.[117] In an opinion written by Justice Scalia, the Court reversed the decision of the court of appeals.[118] The Court agreed with the court of appeals that the PVPA did not contain a quantitative limit on the amount of seed a farmer could sell under the Farmer's Exemption.[119] Instead, the Court based its rationale on its interpretation of the word "marketing" in the section of the PVPA which prohibits sexual multiplication of a plant variety "as a step in marketing."[120] While the court of appeals interpreted marketing to include actions beyond simple selling such as advertising,[121] the Supreme Court found that "marketing" meant selling alone.[122] The Court reasoned that a lack of a quantitative limit in the PVPA combined with an interpretation of "as a step in marketing" that allowed simple selling would deprive certificate holders of any meaningful property protection.[123] Therefore, a farmer is not eligible for the Farmers' Exemption if he plants and saves seeds for the purpose of selling seeds that he produces for replanting.[124] If a farmer saves seeds to replant his acreage, but for some reason changes his plans, then and only then, he may sell those seeds for replanting.[125] Although the Court noted that the language of the Farmers' Exemption to the PVPA was by no means clear, it reasoned that its interpretation was the only reading that com-

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112. *Asgrow*, 982 F.2d at 491. Some of the limitations which the court noted are that a farmer can only save seed descended from seed obtained by the authority of the PVPA certificate owner for seeding purposes; a farmer selling a novel variety must primarily grow crops from that seed for consumption; a farmer who acquires a novel variety from a "brown bag" sale can neither sell nor save seed harvested from that seed; and the sale must comply with state laws. *Id.* at 489.

113. *See* 7 U.S.C §§ 2543, 2541(3)-(4) (1988).

114. *Asgrow*, 982 F.2d at 492.

115. The court reasoned that an expansive reading of the term "marketing" to include simple selling would swallow the entire crop exemption and make it meaningless *Id.*

116. On remand, the trial court was to develop a full record on whether the Winterboers would meet the requirements of the PVPA. *Id.*

117. *Asgrow*, 115 S. Ct. at 792.

118. *Id.* at 796.

119. *Id.* at 795.

120. 7 U.S.C. § 2541(3) (1988).

121. *See supra* note 115.

122. *Asgrow*, 115 S. Ct. at 795.

123. *Id.* at 793.

124. *Id.* at 793.

125. *Id.* at 795.

ported with the statutory purpose of affording "adequate encouragement for research, and for marketing when appropriate, to yield for the public benefits of new varieties."[126]

In his opinion, Justice Scalia noted that, in spite of the fact that the title of the Farmers' Exemption is "Right to save seed; crop exemption,"[127] the authors of the PVPA could not have meant to create a right to save seed because nothing else in the PVPA prohibits the saving of seed.[128] As a result of the *Asgrow* decision, in practice, farmers will rarely, if ever, be able to take advantage of the Farmers' Exemption.

III. INTERNATIONAL INTELLECTUAL PROPERTY LAW REGARDING PLANT RESOURCES

At the time the Convention on Biological Diversity was signed at the United Nations Conference on Environment and Development,[129] the most influential body dealing with plant genetic resources on a worldwide basis was the Union for the Protection of New Varieties of Plants (UPOV), which is based in Geneva.[130] The UPOV's main goal is to protect the property rights of plant breeders and researchers.[131] In fact, the UPOV has a more stringent approach to replanting rights than the PVPA, because the UPOV does not recognize an exemption for farmers to sell saved seeds.[132] While the member countries of the UPOV would seem to be in greater conflict with the Biological Diversity Convention, which favors saving and sharing seeds, than the United States, the majority of the members signed it.[133] Members of the UPOV apparently were willing to accommodate the goals of their organization with those of other countries in attendance at the Earth Summit.[134]

While the Biological Diversity Convention does not have the force of law, it has a place in international intellectual property law. The Biological Diversity Convention provides a view of the direction intellectual property law should take, which is held by nations worldwide.[135] The aspirational goal is that plant resource sharing should take precedence over strict compliance with

126. *Id.* at 790 (citing 7 U.S.C. § 2581 (1988)).

127. *See* 7 U.S.C. § 2543 (1988).

128. *Asgrow*, 115 S. Ct. at 792.

129. *See supra* note 11 and accompanying text.

130. Protection of New Varieties of Plants, *supra* note 16, at 2703. The UPOV was created in 1961 to develop and refine an international system to recognize and protect the legal rights of plant breeders. The United States is a member as are Belgium, Denmark, Ireland, France, Germany, Israel, Italy, Netherlands, New Zealand, South Africa, Spain, Sweden, Switzerland and the United Kingdom. *See* R.S. CRESPI, PATENTING IN THE BIOLOGICAL SCIENCES 71 (1982).

131. *See* Neil D. Hamilton, *Feeding Our Future: Six Philosophical Issues Shaping Agricultural Law*, 72 NEB. L. REV. 210, 252 (1993) [hereinafter *Feeding Our Future*].

132. In 1991, the UPOV adopted a provision which allows member countries to provide a narrow exception for seed to plant on their own farms. The U.S. may try to conform with the UPOV by narrowing the farmers' exemption in the PVPA. *See* Hamilton, *supra* note 52, at 101.

133. *See supra* notes 10-12 and accompanying text.

134. The Biological Diversity Convention was not the first effort to preserve and make accessible the wealth of plant life. International Agricultural Resource Centers (IARCs) have been in operation for some time. IARCs are primarily interested in assisting developing countries in breeding heartier plants. An example of a successful IARC is the International Rice Institute located in the Philippines. The International Rice Research Institute has been successful in developing a variety of rice that will withstand the tropical climate of the Philippines, thus providing a reliable food source. *Feeding Our Future*, *supra* note 131, at 253.

135. *See supra* note 10.

restrictive intellectual property rights.[136]

IV. ANALYSIS

A. *Effects of Intellectual Property Law on the Seed Industry, the Local and International Farmer and Necessary Changes*

1. *The Seed Industry, Research and Development*

With the advent of the Plant Patent Act[137] and the Plant Variety Protection Act,[138] the face of the agricultural industry, including research and development, changed dramatically. The major changes have been in the venue and control of research, which has moved from the public to the private sector, and in the ownership of the results of that research in the form of patents and certificates of protection.

Because most of the major crops grown in the United States are not native to North America, the government was historically very concerned with the importation of crops which would thrive in the emerging nation.[139] With the establishment of the United States Department of Agriculture (USDA) as a cabinet level agency in the mid-nineteenth century, plant research was in the public realm.[140] However, a private seed trade revolving around vegetables and flowers for home gardeners was also emerging.[141] The American Seed Trade Association (ASTA) was formed in 1883 with the purpose of influencing government policy toward more private control of seed resources.[142] The ASTA was instrumental in lobbying for the passage of the Plant Patent Act in 1930.[143] During the next forty years, private industry became more and more involved with plant research.[144] Since the passage of the PVPA in 1971, the trend has continued to the point where almost all research regarding crop breeding now takes place in the private sector.[145]

The movement of research and development to the private sector and the resulting intellectual property protection has had an unanticipated effect. The lure of high profits through patent ownership stimulated a major merger and

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136. *See supra* note 10.

137. *See supra* notes 59-67 and accompanying text.

138. *See supra* notes 68-82 and accompanying text.

139. *See* Buttel & Belsky, *supra* note 63, at 113.

140. As late as 1878, a third of the USDA's budget was spent on germplasm or plant variety collection and distribution. Buttel & Belsky, *supra* note 63, at 113.

141. Buttel & Belsky, *supra* note 63, at 113.The seed trade was active in this area because gardeners usually cut their flowers and use their vegetables before they can go to seed. Thus, home gardeners bought new seed while farmers replanted their own. Buttel & Belsky, *supra* note 63, at 113.

142. *See* Buttel & Belsky, *supra* note 63, at 113.

143. However, the ASTA had an earlier victory in 1924 when it was able to persuade Congress to end free federal distribution of seeds. Buttel & Belsky, *supra* note 63, at 112-13.

144. Buttel & Belsky, *supra* note 63, at 112-13.

145. Buttel & Belsky, *supra* note 63, at 116. The exception may be bio-technical research, which is still done in public institutions. Buttel & Belsky, *supra* note 63, at 118. However, this is mainly an exercise in the division of labor. The public institutions are doing fundamental research which becomes the basis for private industry to develop. Public institutions are not developing products so much as knowledge to be utilized by the private sector. Also, public institutions rely heavily on funding from private industry. Buttel & Belsky, *supra* note 63, at 118. *See also* Hamilton, *supra* note 52, at 89.

acquisition movement in the 1970s.[146] As a result, today a great number of intellectual property rights are in the hands of a surprisingly small number of multinational corporations.[147]

The advent of patent protection for plants has had a great influence on the seed industry. However, the effect of patent protection for seeds may have had an even greater effect on the farmers themselves.

2. *The United States Farmer*

The effect of legal ownership of plant genetic resources by the seed developer on United States farmers is threefold. First, there is a general increase in the cost of farming. Second, there is a general reduction in the availability of a variety of crops. Finally, farmers lack a voice in the decisions affecting the direction of future research regarding the development of new plants.

In the United States, a surprisingly small number of companies own the majority of plant patents.[148] As a result, there is not much competition for offering the lowest price. This fact, coupled with the recent narrow interpretation of the Farmer's Exemption of the PVPA,[149] will inevitably result in higher prices for farmers when they are forced to buy new seeds without being able to offset the cost by selling the previous season's seeds for replanting. A valuable source of income will be lost to the farmer and he will also be forced to buy new seeds from the developer more often.

The increased expense of buying seed may ultimately result in fewer crops for the farmer to chose from. If farmers are unable to sell seeds from the previous season's crop to other farmers for replanting, chances are they will replant the seed themselves. Repetitive farming of the same crops on the same land results in soil exhaustion.[150] Crop rotation, even if it involves rotating different varieties of the same crop, prevents the soil from becoming fallow.[151] In addition to lower soil quality, a reduction in seed variety also results in a decreased range of food sources which affects the consumer as well as the farmer.

The lack of input farmers have in determining the direction of research by the owners of plant patents has, perhaps, the most serious consequences. For example, if a chemical company holds a patent on a certain seed and chooses to develop it, the company may attempt to develop a plant which is more resistant to herbicides or pesticides which it produces.[152] This sort of development would allow a farmer to use more chemicals on his crops -- chemicals which he

146. Buttel & Belsky, *supra* note 63, at 116.

147. Buttel & Belsky, *supra* note 63, at 117, table 6.2. Some of the corporations of which seed companies are subsidiaries are Cargill, Monsanto, Occidental Petroleum, Upjohn, and Shell Oil. Buttel & Belsky, *supra* note 63, at 117.

148. Many of these companies are petroleum or chemical companies. Buttel & Belsky, *supra* note 63, at 117.

149. *See supra* notes 117-128 and accompanying text.

150. *See supra* note 9.

151. Instead of specializing in a single crop and planting it in the same field every year, farmers who are interested in long term sustainable farming will use multi-year rotations and increase crop diversity to avoid soil exhaustion. *See supra* note 9.

152. It is important to recognize that seed companies are now often subsidiaries of multinational companies with huge interests in fertilizer, herbicide, and pesticide which are more important in terms of revenue than are seeds. For example, a small company has identified a gene that confers tolerance to Roundup, the leading herbicide for corn which is marketed by Monsanto. If this technology is licensed to Monsanto, it is unlikely that Monsanto will restrict access to it because of the potential for selling more Roundup. Buttel & Belsky, *supra* note 63, at 138 n.10.

purchases from the same company which develops the seed itself.[153] Again, the farmer's costs increase. The farmer, if given a choice, would probably prefer to see the development of crops resistant to the weeds and pests themselves instead of the chemicals which deal with the problem.

3. The International Farmer

Ownership of plant genetic resources by a small number of companies has many of the same effects on farmers in the international community as on those within the United States. In addition to the diminished availability of a variety of crops, however, there is the added possibility that people in less developed areas will be denied recognition for the use of plants they have been using for generations and denied access to developing plant or agricultural technologies.[154]

While farmers in "westernized" or industrialized countries are in the same situation as American farmers, farmers in less developed countries[155] are especially disadvantaged. Not only do they lack the technical means to compete in the research and development of plant genetic resources, but they also lack the funds to purchase the new plant resources on the market.[156] This leaves less developed countries with inferior farmland unable to produce an adequate food supply and prevents them from developing further.[157]

Another danger of allowing patents on plant genetic resources which farmers in less developed countries face is the possibility that more developed countries will patent their native resources.[158] Nothing in the PVPA or the UPOV precludes the patenting of newly "discovered" plants in addition to those bred by researchers.[159] This leads to the question of what exactly the word "discovered" means and who is capable of "discovery." If "discovery" means exploitation by more developed countries, less developed countries are sure to lose in a claim for intellectual property rights because they do not have the resources or technology to develop a plant product.[160]

4. Toward the Equitable Distribution of Plant Genetic Resources

Equal access for all nations to the benefits of the wealth of plant resources

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153. Agricultural runoff is not currently a "point source" for water pollution but considering the amount of pollution which flows from agriculture, regulation and liability for the users of farm chemicals may be a reality in the future. *See supra* note 7.

154. This seems to be a real danger in light of the fact that the main reason the United States refused to sign the Biological Diversity Convention was the potential conflict with intellectual property law and the exploitation of new-found resources. *See supra* note 14 and accompanying text.

155. The United Nations adopted the terms "less developed countries" and "more developed countries" to distinguish levels of technological and economic advancement without reference to location. G. TYLER MILLER, JR., SUSTAINING THE EARTH, AN INTEGRATED APPROACH 5 (1994).

156. *See* Starr & Hardy, *supra* note 4, at 98.

157. Historically, technology regarding food production technology was a matter of national defense. Considering the large surpluses in some countries compared with the problem of hunger in others, this is an outmoded justification for intellectual property rights. The Biodiversity Convention recognizes the importance of sharing resources for global development. *United Nations Conference, supra* note 10, at 815.

158. *See generally Feeding Our Future, supra* note 131, at 252-53.

159. In *Diamond v. Chakrabarty*, the Court noted that plants found in the wild are not patentable. 447 U.S. 303, 309 (1980). What of the crop variety used for centuries by native people in a less developed country? Nothing seems to preclude patenting in that scenario.

160. *See generally Feeding Our Future, supra* note 131, at 252-53; Starr & Hardy, *supra* note 4.

will require action on both an international and a national level. The signing of the Biological Diversity Convention is a positive first step to protecting the plant genetic resources of the world and sharing them with countries who might not otherwise have access to them. However, the UPOV could do its part by providing a Farmers' Exemption, which includes selling saved seed, similar to the exemption included in the PVPA.[161] The UPOV should also recognize an exemption or possibly a credit system for historically native crops discovered in less developed countries by more developed countries. Finally, International Agricultural Resource Centers[162] should receive increased support from the United Nations or the private sector in terms of money and technology to ensure the development of crops which will thrive in less than ideal farming conditions in nations where hunger is always prevalent.

At the national level, an amendment to the PVPA which would explicitly allow farmers to save or sell a specific amount of seed for replanting or sale to other farmers is a necessary first step.[163] After *Asgrow*,[164] farmers may only sell seed in the event that they did not plant the crop with the intent of selling the resulting seed.[165] The voices of farmers are perhaps the most important ingredient to prevent the harms of too much private ownership of plant genetic resources. They are the primary purchasers and consumers of the products of the seed companies. Farmers can use their purchasing power to send a message regarding the direction they want research to take. They can also use their power with legislators to influence the direction of patent law in the future. Finally, farmers can save seed for replanting their own acreage or they could share it with others, possibly by trading with other farmers. Farmers must become aware of the financial, social, and environmental consequences which may result when a small number of companies control a vast amount of resources.

In addition to an amendment explicitly allowing farmers to save or sell seed, Congress should consider other major changes to the PVPA. One of the purposes of the PVPA is to stimulate private investment into the field of plant research regarding breeding.[166] The ownership of many intellectual property rights by a few private interests does not carry out this purpose. The fact that the PVPA also has an exception allowing companies to use the patented plants of others for research also detracts from the purpose of stimulating research because patent holders are essentially working together instead of competing

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161. *See supra* note 83 and accompanying text.

162. *See supra* note 134.

163. Perhaps a formula such as half of a crop as was suggested by the district court in *Asgrow* would be appropriate. The district court arrived at the "half of a crop" amount by calculating the amount of soy beans needed to replant the farmer's own acreage and the surplus resulting from each crop. Asgrow v. Winterboer, 795 F Supp. 915, 919 (N.D. Iowa 1991). Some sort of limit on the amount of seed a farmer can save and sell is needed. For example, Pioneer Hi-Bred International decided to stop breeding one variety of wheat because 92% of hard red winter wheat planted in one year came from "brown bagging." *See* Hamilton, *supra* note 52, at 95. A quantitative limit set by Congress would be much clearer than the current statutory language. *See* 7 U.S.C. § 2543, *supra* note 83 and accompanying text.

164. *See supra* notes 93-128 and accompanying text.

165. *See supra* note 125 and accompanying text.

166. *See supra* note 70 and accompanying text.

with one another.[167] If a few companies own all of the resources and do not face liability for infringement, there is no incentive to compete and there is even a risk of monopoly. A reduction in the length of time for applicability of patents is a possible remedy to this situation.[168] If the patent holder knows that his patent will expire shortly, he will innovate to secure another patent.

Finally, the United States must join with the rest of the world and embrace the spirit and substance of the Biological Diversity Convention. With the vast amount of agricultural resources at its disposal, the United States should be leading the world in the protection, development, and equitable distribution of plant technology, not lagging behind in deference to its intellectual property law.[169]

In considering the great influence intellectual property laws have on the plant industry and farmers worldwide, it is apparent that the property rights of a few can and do affect the lives of many. To ensure that the livelihood of farmers is not overshadowed by the property rights of patent holders, the laws must change to reflect the value and importance of expanding access to plant genetic resources and the role farmers themselves play in reaching that goal.

V. CONCLUSION

If plant genetic resources are patentable without limitation, the fate of many crops is in the hands of a few developers. As a result of the recent Supreme Court decision in *Asgrow Seed Co. v. Winterboer*,[170] the Farmers' Exemption to the PVPA is of no useful benefit to the farmer. The availability of crops nationwide and worldwide is threatened.

The control over crop availability by a few patent holders is a direct result of patent law, even though that is certainly not the intent behind the patent statutes and patent law in general. Patent law does not exist to benefit the individual or the conglomerate.[171] Concern for the benefit to the public is evident in the Constitution where the stated purpose of allowing patents is "[to] promote the Progress of Science and *useful Arts*."[172] This concern for the public good also appears in the last line of the stated purpose of the PVPA which declares an interest in "promoting progress in agriculture in the *public interest*."[173] Thus far, case law has focused on the stimulation of private investment

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167. 7 U.S.C. § 2544 (1988), *see also supra* note 78 and accompanying text.

168. Currently, plant certificates of protection under the PVPA are good for 18 years. 7 U.S.C § 2483(b) (1988). Shorter term patents may stimulate the innovation that was formerly influenced by a greater number of competitive companies.

169. The relationship between the UPOV and IARCS proves that intellectual property rights do not preclude the sharing of resources. The UPOV and IARCs have coexisted peacefully for years even though the UPOV is more stringent than the PVPA regarding seed sharing. Also, the other members of the UPOV ratified the Biological Diversity Convention which favors plant resource sharing. *See supra* note 12 and accompanying text. In contrast, the United States was not willing to look beyond its sovereign interest in property rights to improve the quality of world agriculture. *See supra* note 14. The United States, therefore, is out of step with the rest of the world in its attitudes toward sharing plant resources.

170. 115 S. Ct. 788 (1995).

171. *See supra* note 17.

172. U.S. CONST. art. I, § 8, cl.8 (*emphasis added*). *See supra* note 17 and accompanying text.

173. H.R. REP. NO. 1605, 91st Cong., 2d Sess., 84 Stat. 1542 (1970), *reprinted in* 1970 U.S.C.C.A.N. 1793 (*emphasis added*). *See supra* note 70 and accompanying text.

and competition as the primary purposes of patent law.[174] However, the promotion of private interest which does not benefit the public is not a valid purpose. Laws should benefit the society which creates them, not just a few individuals. When a law or policy no longer serves its purpose, it is time for a change.

One of the changes that is long overdue is that of perspective regarding the role patent law should play. Patent law should not be used for the exclusive benefit of the citizens of one country or continent. While a reliable and healthy food supply may have been a matter of national security and defense at one time, that is no longer true considering the surplus in many countries today. To achieve the goals of the Biological Diversity Convention and to preserve the vitality of plant biodiversity, cooperation of nations and the participation of farmers in decision-making are essential.

Thomas Jefferson wrote "[t]he greatest service which can be rendered any country is to add a useful plant to its culture."[175] Perhaps we should embrace this statement with one small change. In reconciling the role patent law should play with the need for protection and distribution of biologically diverse crops, we should keep in mind that the greatest service which can be rendered any *society*, is to add a useful plant to its culture.

Susan E. Gustad

174. *See supra* notes 26, 47-51 and accompanying text.
175. DUMAS MALONE, JEFFERSON AND THE RIGHTS OF MAN 126 (1951).