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DID I SAVE MY SEED FOR THIS? UNITED STATES INTELLECTUAL PROPERTY LAW, THE CONTINUING SHIFT IN PROTECTION FROM GROWERS TO DEVELOPERS, AND SOME POTENTIAL IMPLICATIONS FOR AGRICULTURE

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INTRODUCTION:

Advances in genetic modification techniques enable the creation of crops with commercially desirable characteristics. Recombined gene sequences may be inserted into a crop's genome to protect it against herbicides, insects, or rodents.¹ In the United States, a variety of patent and trade secret protections are afforded the developers of such crops and other genetically modified organisms. The scope of these protections has been interpreted more broadly over the years by the courts. This broadening of legal protections has occurred as the relationship between the developers of seed, the government, and farmers has changed from one in which seed development was largely the work of the government and academia, especially public universities and land grant colleges, to one in which seed development is increasingly privatized, or accomplished through the alliance of private and public forces.

These changes have been influenced by Congressional legislation and its judicial construction. *Chakrabarty* and *J.E.M. v. Pioneer* are leading cases defining the protections

¹ *Monsanto Co. v. Ralph*, 382 F.3d 1374, 1377 (Fed. Cir. 2004).

available to the developers of seed. Both hold that broad, overlapping regimes of legal protection exist for the developers of seed. These cases paved the way for the development of the genetic modification of crops that have been marketed to, and adopted by, American farmers.² These crops are commonly sold in bags with seedwrap licenses prohibiting, inter alia, the saving and replanting of the seed they contain.³ Seedwrap licenses protect seed companies' investments by making farmers purchase new seed every year, rather than saving seed from the previous year's planting.⁴ Recent lower court decisions have upheld the validity of seedwrap licenses. These most recent decisions may comport with constitutional imperatives but represent a continuing departure from prior agricultural seed-developing practices and a shift in legal protection from growers to developers.

CURRENT BASES FOR UNITED STATES INTELLECTUAL PROPERTY LAW FOR SEED DEVELOPERS

Legal protections available to seed developers include utility patents, plant patents, the Plant Variety and Protection Act and trade secret law.⁵ The scope of these rights has shifted over the years. The following sections briefly survey the types of legal protection currently available to seed developers and note some of their requirements, similarities, and differences.

I. PATENTS

Patent rights originate in the constitutional grant to Congress "to promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive

² Roger A. McEowen, *Legal Issues Related to the Use and Ownership of Genetically Modified Organisms*, 43 WASHBURN L.J. 611 (2004). Most notably, these crops include corn, soybeans, cotton, and canola. *Id.*

³ *Id.*

⁴ *Id.*

⁵ See generally Jonathan D. Carpenter, Note, *Intellectual Property: The Overlap Between Utility Patents, Plant Patents, the PVP Act, and Trade Secrets and the Limitations on that Overlap*, 81 N.D. L. REV. 171, 173-79 (2005).

Right to their respective Writings and Discoveries.”⁶ The goal of patent law is to encourage invention by providing economic incentive to inventors to invent by offering some assurance that their inventions may be protected by law. The United States Patent and Trademark Office grants utility, plant, and design patents.⁷ The following is a cursory overview of utility and plant patents (design patents not being relevant for the purpose of this Note).

A. UTILITY PATENTS

Utility patents are granted to technological innovations⁸ that have a practical use.⁹ These are inventions that are novel, useful, non-obvious, and contain appropriate subject matter.¹⁰ If these and other formal requirements are satisfied, a patentee is granted an exclusive, negative right to prevent others from making use of or selling the invention for a term of years,¹¹ generally 20 years after the filing date of the application.¹² Utility patents may be issued for plants, although this has not always been the case.¹³ They may also encompass DNA sequences, cells, tissue cultures, and entire plants.¹⁴

B. PLANT PATENTS

⁶ U.S. CONST. art. I, § 8, cl. 8.

⁷ 35 U.S.C. §§ 101-57, 161-64, 171-73 (2004).

⁸ ALAN L. DURHAM, *PATENT LAW ESSENTIALS* 14 (Praeger Publishers 2004) (1999). A “technological innovation” does not include a product name, corporate emblem, painting, musical composition, novel, or the like, which may be protected by copyright or trademark law, as the case may be.

⁹ *Id.* at 173.

¹⁰ 35 U.S.C. §§ 101, 103 (2004).

¹¹ Carpenter, *supra* note 5, at 174, *citing* DONALD S. CHISUM, *CHISUM ON PATENTS*, 16.02[1] (2004).

¹² DURHAM, *supra* note 6, at 135.

¹³ J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int’l Inc., 534 U.S. 124 (2001).

¹⁴ Keith Aoki, *Weeds, Seeds, and Deeds: Recent Skirmishes in the Seed Wars*, 11 CARDOZO J. INT’L & COMP. L. 247, 289 (2003).

A plant patent represents a claim to a new plant variety as a whole.¹⁵ The threshold of novelty is less demanding than utility patent's nonobviousness standard.¹⁶ Plant patents are granted to asexually reproducing plants that are distinct and new.¹⁷ To be eligible for a plant patent, the plant may not tuber-propagated and may not be found in an uncultivated state.¹⁸ Formal requirements are generally similar to those of utility patents¹⁹ but the description of a plant patent must be "as complete as is reasonably possible."²⁰ Plant patents are also similar to utility patents in that the patent confers on the patentee an exclusive, negative right to prevent others from making use of or selling the invention for a term of years.²¹ However, this exclusionary right is narrow: in order to find infringement, the patentee must establish that the allegedly infringing plant is the offspring of the original.²² A genetically identical plant, if independently developed, does not infringe on a plant patent.²³

¹⁵ *Id.* at 289.

¹⁶ DURHAM, *supra* note 6, at 197-98.

¹⁷ 35 U.S.C. §161 (2006) (sexual reproduction is the growth of a genetically identical copy through budding, grafting, or cutting) *See generally* JANICE M. MUELLER, AN INTRODUCTION TO PATENT LAW 194 (2003).

¹⁸ 35 U.S.C. §161 (2006); Carpenter, *supra* note 5, at 176.

¹⁹ *See* Carpenter, *supra* note 5, at 176; 35 U.S.C. § 161 (2006).

²⁰ 35 U.S.C. §162 (2006).

²¹ Carpenter, *supra* note 5, at 176, (citing CHISUM, *supra* note 9, 5-16, 16.04(6)).

²² MUELLER, *supra* note 17, at 195-96, *citing* Imazio Nursery, Inc. v. Dana Greenhouses, 69 F.3d 1560, 1569 (Fed. Cir. 1995).

²³ *Id.* at 196.

II. PLANT VARIETY AND PROTECTION ACT

The Plant Variety and Protection Act (PVPA) extends patent-like protection²⁴ to sexually reproducing plants (or tuber-propagated plant varieties) that are new, distinct, uniform, and stable.²⁵ Like a utility patent, a PVPA application must describe the invention and include a deposit of a viable sample necessary to propagate the plant.²⁶ However, unlike utility or plant patents, the PVPA certificates protection issue from the Plant Variety Protection Office in the Department of Agriculture.²⁷ The PVPA contains a provision that allows growers to save and replant PVPA-protected seed.²⁸ Like a plant patent, a PVPA certificate permits only a claim for a plant variety.²⁹ A PVPA certificate grants its holder the right to exclude others from selling or reproducing the plant variety for twenty years after the date of issuance.³⁰

III. TRADE SECRET LAW

Since trade secret law is state law, each state is free to develop its own law; however, forty-two states have adopted some form of the Uniform Trade Secrets Act (USTA).³¹ Under the USTA, a trade secret 1) consists of qualified information, 2) is secret, 3) is the subject of reasonable efforts to maintain secrecy, and 4) confers a competitive advantage upon its

²⁴ Michael T. Roberts, *National AgLaw Center Research Article*, J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred International, Inc.: *Its Meaning and Significance for the Agricultural Community*, 28 S. ILL. U.L.J. 91, 99 (2003).

²⁵ See generally 7 U.S.C. § 2402(a) (1996).

²⁶ Carpenter, *supra* note 5, at 177 (citing 7 U.S.C. § 2422 (1994)).

²⁷ *Id.* at 176 (citing JOHN GLADSTONE MILLS III, DONALD C. REILEY III & ROBERT C. HIGHLEY, 1 PAT. L. FUNDAMENTALS, § 7.24 (2d ed. 2004)).

²⁸ Aoki, *supra* note 14, at 284 (citing U.S.C. § 2543 (2001)).

²⁹ *Id.* at 289.

³⁰ Carpenter, *supra* note 5, at 177 (citing 7 U.S.C. §2483(b)(2)(A)-(B) (2000)).

³¹ *Id.* at 178 (citing Marina Lao, *Federalizing Trade Secrets Law in an Information Economy*, 59 OHIO ST. L.J. 1633, 1657 (1998)).

possessor.³² The amount of potentially qualifying information is much broader than that protected by patent law and requires that the protected information *not* be disclosed as opposed to the patent law requirement that the information *be* disclosed.³³ Like patent law, the goal of trade secret law is to encourage invention.³⁴

Violation of trade secret law occurs by breach of contract or confidence.³⁵ An example of a contract is when seed developers issue seedwrap licenses. Seedwrap licenses purportedly attach in the opening of the bag and forbid the purchaser of that bag from saving and replanting the seed in the bag.³⁶

OVERLAP BETWEEN INTELLECTUAL PROPERTY REGIMES

Courts have been willing to expand the scope of these protections so that they overlap with one another. The PVPA may overlap horizontally with other federal statutes and vertically with state trade secret statutes. In *J.E.M.*, the Supreme Court held that the PVPA does not preclude a patentee from obtaining a utility patent³⁷ and that dual protection under the PPA and utility patent law was permissible where both sets of requirements were satisfied.³⁸ In *Pioneer v. Holden*, the Eighth Circuit held that state trade secret law is not preempted by the PVPA, reasoning that there was a lack of specific congressional intent to preempt state law.³⁹

³² *Id.* at 178 (citing JAMES POOLEY, TRADE SECRETS, § 1.01 (2004)).

³³ *Id.* at 178-79.

³⁴ *Id.* at 179.

³⁵ McEowen, *supra* 2, at 639-40.

³⁶ See *id.* at 640.

³⁷ *J.E.M. v. Pioneer*, 534 U.S. at 145.

³⁸ *Id.* at 133.

³⁹ *Pioneer Hi-Bred Int'l v. Holden Foundation Seeds, Inc.*, 35 F.3d 1226, 1242-43 (8th Cir. 1994).

Trade secret protection may complement utility or plant patents.⁴⁰ Because of patent law's disclosure requirements, the information that is the subject matter of the patent enters the public domain at the expiration of the patent.⁴¹ The subject matter of the trade secret protection is therefore complementary and different from the subject matter of the patent.⁴² Consequently, it continues upon the expiration of patent protection.⁴³ In contrast, trade secret protection may be concurrent with that offered by PVP certificates.⁴⁴ Because PVP applications are confidential, the information they contain is not disclosed to the public; therefore the protection they afford is concurrent, rather than complimentary.⁴⁵

A BRIEF HISTORY OF SEED DEVELOPMENT

Present litigation involving seed developers and farmers involves the confluence of a variety of competing values and interests.⁴⁶ As seed development technology has improved, new markets for new types of seed have been created. Simultaneously, the relationship between the government, seed developers, and farmers has changed through the years as broader legal and biological protections have become available to seed developers. This section will explore some of the changes in the way seeds have been developed.

⁴⁰ Carpenter, *supra* note 5, at 195; *In re Hayes*, 982 F.2d 1527, 1534 (Fed. Cir. 1992).

⁴¹ *Id.*

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ 7 U.S.C. § 2426 (1980).

⁴⁶ Aside from seed developers and farmers, organic farmers, consumer groups and the USDA, among others and to the extent that distinctions the various groups can be observed, are all interested parties.

Historically, seeds have been difficult to commodify because a person buying seeds could grow and save seeds to plant in future years.⁴⁷ This meant that a seller of seeds could be fully compensated for the future value of the seeds she sold.⁴⁸ From the advent of the development and marketing of hybrids at the beginning of the twentieth century to the creation of Monsanto's Terminator(R) technology at the end of the twentieth century, in addition to subsequent advances in breeding and genetic engineering techniques, have enabled companies to obtain legal recompense and have thus created new sources of potential profit.⁴⁹

Hybrid seeds are good candidates for commodification. Hybrid seeds are more easily commodified than non-hybrids because while the seed purchased by the farmer has been bred to have a set of desirable characteristics in its first generation, the second generation will see a genetic "shuffling" and an attendant increase in variability.⁵⁰ This variability will not suffice for industrial agriculture, which requires uniformity.⁵¹ Thus, there is incentive to purchase new seed every year (and for seed companies to develop and market more hybrid varieties⁵²).⁵³ The end result, a disincentive for farmers to save and replant, is the same as that obtained through a seedwrap license.

⁴⁷ Aoki, *supra* note 14, at 250.

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ Martha L. Crouch, *How the Terminator Terminates*, available at <http://www.biotech-info.net/howto.html> (last visited Oct. 23, 2005).

⁵¹ *Id.*

⁵² Some major crops are not grown from hybrid seeds, including wheat, rice, soybeans and cotton. Farmers frequently save these seeds. Crouch, *supra* note 47.

⁵³ The end result, a disincentive for farmers to save and replant, is the same as that obtained through a seedwrap license. [same text as that which follows 50]

However, the present commodification and privatization of seed has not always been. A variety of public institutions have been involved in the production and distribution of seed for the better part of the last two centuries. Beginning in 1857, the Patent and Trademark Office established a garden in order to produce seeds for widespread distribution because of a lack of private investment.⁵⁴ Investors were loath to invest in seed development because they did not believe there was any way they could recoup their investments.⁵⁵ As well, the 1850s witnessed the establishment of a number of Land Grant Colleges (LGCs) whose mission was one of agricultural education and research.⁵⁶ The seeds developed by these programs were disseminated free of charge.⁵⁷ The LGCs also created seed certification programs to ensure seed quality.⁵⁸

By the 1890s, there was opposition to the seed distribution program from the executive branch, as well as from the newly-emerged private seed industry.⁵⁹ Opponents of governmental seed distribution contended that the private industry could develop new varieties of seed more efficiently and that by distributing seed at no charge the government had placed itself in the business of competing directly with the private seed industry.⁶⁰ Opponents of the program pointed to stagnant crop yields, particularly during the 1920s, as evidence of the

⁵⁴ Aoki, *supra* note 14, at 265.

⁵⁵ *Id.*

⁵⁶ *Id.* at 266.

⁵⁷ *Id.* at 266-67.

⁵⁸ *Id.* at 270.

⁵⁹ *Id.* at 267.

⁶⁰ *Id.*

federal government's failure in its mission to bring improved varieties to farmers.⁶¹ The seed certification programs of the LGCs interfered with private seed developers' efforts to differentiate their products from one another.⁶² However, the program was politically popular and Congress responded to the concerns of its constituents by continuing its support.⁶³

By the 1940s, however, the relationship between the federal and state governments had changed. Thanks in part to the lobbying of the private seed industry (whose efforts were spurred by the potentially lucrative markets developed for hybrid crops), the LGCs moved away from the development of "finished" varieties and reoriented their research to focus upon "basics" that complimented, rather than competed directly with the private industry.⁶⁴ The LGCs and their apparatus, originally developed to distribute seed to individual growers, were transformed, with the political and economic support of the seed developers, into a bank of genetic material from which the private industry could withdraw genetic material in creating new lines of seed and seed products.⁶⁵ Then, and in the following decades, U.S. intellectual property law reflected a policy of increased encouragement of private involvement in the development of seed.

CASE LAW OF THE PAST TWENTY-FIVE YEARS

The path leading to *J.E.M.* and its progeny begins with *Chakrabarty*. In *Chakrabarty*, decided in 1980, the Supreme Court held that living organisms (in this case, a bacterium), may

⁶¹ *Id.* at 270.

⁶² *Id.* at 269.

⁶³ *Id.* at 267.

⁶⁴ *Id.* at 274.

⁶⁵ *Id.* at 275.

constitute patentable subject matter under 35 U.S.C. § 101.⁶⁶ In so doing, the Court construed the language of §101, “manufacture” and “composition of matter” broadly, reasoning that because the language of the statute was broad, its interpretation should likewise be broad.⁶⁷ In *Chakrabarty*, the Court appeared to view as dispositive the fact that the bacterium in question had been genetically altered and was, accordingly, “not nature’s handiwork, but [the patentee’s] own.”⁶⁸ The Court’s decision to grant utility patents to genetically altered organisms provided incentives for the further development of such organisms and helped pave the way for U.S. advances in biotechnology in subsequent decades by assuring private investors that the advances funded by their capital would be protected by the law. In so doing, Aoki argues, the Court has “emphasized a very particular form of human agency, and...made invisible other types of collectively generated...human agency that the genetic structure of the major food crops grown by traditional, agriculture represents.”⁶⁹

Confusion remained as to whether the previously enacted PVPA provided protection that was exclusive of or concurrent with that provided by utility patents. This confusion was resolved in 1985 in *Ex Parte Hibberd*, when the Board of Patent Appeals held that the PPA and PVPA did not preclude the patentee from seeking a utility patent for plants that otherwise satisfied the requirements of the Patent Act.⁷⁰ *Hibberd* opened the door for the PTO to grant

⁶⁶ *Diamond v. Chakrabarty*, 447 U.S. 303, 310 (1980).

⁶⁷ *Id.* at 308.

⁶⁸ *Id.* at 310.

⁶⁹ Aoki, *supra* note 14, at 287.

⁷⁰ *Id.* at 288.

utility patents covering various aspects of plant germplasm, including individual genes and DNA sequences linked to specific traits.⁷¹

In the wake of these decisions, striking advances in the development of agricultural crops occurred in the 1980s and 1990s. Chief among these advances are the Monsanto Company's development of Roundup Ready(R) and Terminator(R) Seed. The technology in the Terminator(R) patent enables a plant to grow normally from seed but disrupts the normal life cycle by inserting a gene that causes the production of a toxin that creates non-viable seed.⁷² Roundup Ready(R) technology involves the insertion of a gene conferring resistance to Monsanto's herbicide Roundup(R).⁷³ Many varieties of crops have been developed that incorporate these technologies, including varieties of corn, cotton, soy, and alfalfa. The development of these seeds represents "an aggressive move into the crop seed market."⁷⁴

In *J.E.M. v. Pioneer*, decided in 2001, the Supreme Court held that 35 U.S.C. § 101 included sexually reproduced food crops.⁷⁵ In *J.E.M.*, plaintiff Pioneer Hi-Bred sued defendant J.E.M. when J.E.M. sold seed to defendant's farms in violation of the terms of the seedwrap license attached to the bags of seed.⁷⁶ Farm Advantage counterclaimed that the patent was invalid because sexually reproducing plants were not included within the scope of § 101.⁷⁷

⁷¹ *Id.* at 289. In fact, more than 1800 utility patents were issued in the wake of *Hibberd*.

⁷² *See* Crouch, *supra* note 47.

⁷³ *See* *Monsanto Co. v. Ralph*, 382 F.3d 1374 (Fed. Cir. 2004).

⁷⁴ Aoki, *supra* note 12 at 253.

⁷⁵ *J.E.M. v. Pioneer*, 534 U.S. at 145.

⁷⁶ *Id.* at 128-29.

⁷⁷ *Id.* at 129.

The Court's analysis in *J.E.M.* observed *Chakrabarty's* "extremely broad" reading of 35 U.S.C. §101.⁷⁸ The Court then noted that nothing within the Plant Patent Act indicated that its protection for asexually reproduced plants was intended to be exclusive.⁷⁹ The Court held that the PVPA does not deny utility patent protection for sexually reproduced plants, nor does it restrict the scope of patentable subject matter.⁸⁰ The Court found that Congress had not indicated that the assignment of utility patents for plants was inconsistent with the PVPA or PPA over the past sixteen years.⁸¹

The *J.E.M.* decision has been praised and criticized. It has been praised because it allows the PPA, the PVPA, and the Utility Patent Act to serve the judicial goal of achieving consistency in the law by complementing one another.⁸² As well, because plant patents and PVPCs contain less demanding requirements (while conferring more limited protection), breeders are free to pick and choose which regulatory scheme best meets their needs while not precluding them from obtaining other intellectual property protection.⁸³ Further, by upholding the validity of the plaintiff's utility patents, the Court's holding encourages the investment of the resources of the biotechnology industry in the field of agriculture, an involvement that may allow the production of higher-yielding, nutritiously-enhanced crops.⁸⁴ Such crops could arguably help attack the problem of hunger, particularly in the developing world; because of

⁷⁸ *Id.* at 130.

⁷⁹ *Id.* at 132.

⁸⁰ Roberts, *supra* note 24, at 105.

⁸¹ *J.E.M. v. Pioneer*, 534 U.S. at 144-45.

⁸² Roberts, *supra* note 24, at 109.

⁸³ *Id.*

⁸⁴ *Id.* at 111-12.

the potentially higher crop yields of genetically modified crops.⁸⁵ Genetically-modified crops have the potential to require the application of fewer herbicides and pesticides than do conventional crops because the herbicides and pesticides are contained within the plants themselves and thus do not need to be applied by others.⁸⁶ This decreased use of pesticides may help reduce negative environmental effects upon the air, soil, and water.

J.E.M. has also been criticized on both legal and policy grounds. One criticism of the Court's legal reasoning is that it misconstrued existing court cases. Michael Roberts has argued that "[t]he Court appears to have overreached. Neither Pioneer nor any lower court opinion had ever suggested this view of the PPA [the view that the PPA's protection for asexually reproduced plants was intended to be exclusive]. There is no dispute that Congress had expressly rejected seed patenting when it passed the PPA."⁸⁷ As well, Dan Burk notes that two of the cases cited by the majority (*Kewanee* and *Mazer*) are not appropriate comparisons because they are irrelevant and stand for the proposition that regimes of intellectual property protection are not overlapping.⁸⁸

⁸⁵ Neil D. Hamilton, *Forced Feeding: New Legal Issues in the Biotechnology Policy Debate*, 17 WASH. U. J.L. & POL'Y 37, 40-41 (2005) (A dispute arising in the context of American shipments of grain to southern Africa in the 1990's frames the issue. African nations slated to receive shipments of grain expressed concerns that the grain they received might contain GMOs. American grain marketing does not make this distinction, the nations would have no way of knowing whether the grain they received was genetically modified or not. This in turn would have potentially affected its resale potential, especially in Europe, upon any saving and replanting of the grain. If they did not accept the grain shipments, the governments of the nations in question ran the risk of having people die because they did not accept crops without any known food safety risks); *See id.*

⁸⁶ Roberts, *supra* note 24, at 112 (The higher yields promised by the biotechnology industry may be questioned); *see id.*, (citing Bruce Rubenstein, *Growing Agro-Biotech Business Fuels Patent Battles, Dominance of a New Industry at Stake*, CORP. LEGAL TIMES, Feb., 1999, at 29).

⁸⁷ *Id.* at 104.

⁸⁸ Dan L. Burk, *Symposium: Legal Constraint of Genetic Use Restriction Technologies*, 6 MINN. J. L. SCI. & TECH. 335 (2004).

In the same vein, Malla Pollack has argued that the Court's holding in *J.E.M.* represents a strained interpretation of minor statutory language not intended to indicate what the Court claims it does.⁸⁹ Pollack contends that the language of section 119 of the Patent Act, some of which was relied upon by the majority in support of its proposition that the Congress recognized the availability of utility patents for plants, was not strong support for the evidence of congressional intent because it was "part of a rushed, middle of the night, insertion into an omnibus appropriations act" and that the reading of section 119 of the Patent Act as recognizing the availability of utility patent protection for plants further suffered for being inconsistent with what prior Congresses understood the meaning of 35 U.S.C. §101 to be.⁹⁰

As well, Pollack has argued that Canada's interpretation of its statutory list of patentable subject matter, which is nearly identical to 35 U.S.C. §101, is more reasonable than that of the Court in *J.E.M.*⁹¹ The Supreme Court of Canada held that "manufacture" and "composition of matter" did not cover the Harvard oncomouse on the grounds that to do so would be to go beyond the statute and that in the absence of clear, legislative decision the court was not free to do so.⁹² Pollack contends that Canada's resolution of the issue had a sounder basis in the law and characterizes *J.E.M.* as "legal formalism run amok."⁹³

Critics of *J.E.M.* have expressed concerns about its environmental, social, and economic ramifications. Critics of genetic engineering point to the potential for genetic

⁸⁹ See generally Malla Pollack, *Originalism, J.E.M., and the Food Supply, or Will the Real Decision Maker Please Stand Up?*, 19 J. ENVTL. L. & LITIG. 495 (2004).

⁹⁰ *Id.* at 509.

⁹¹ *Id.* at 515-16.

⁹² *Id.* at 515.

⁹³ *Id.* at 516.

drift.⁹⁴ The potential for genetic drift means that a farmer attempting to raise an organic crop may be found liable for patent infringement if proprietary genetic material were to find its way into the farmer's organic field.⁹⁵ This scenario also raises the possibility of consumers who thought they were buying organic products being misled, thinking they were buying something that was not genetically modified when, in fact, they were buying something that was genetically modified.

The sale of genetically modified seeds could have unforeseen effects upon the ecosystem, including the soil, insects, birds, and bacteria.⁹⁶ In 2002, for example, there were reports of a potential correlation between fertility issues in swine and the use of GM corn in their feed.⁹⁷ The correlation was not proven and the official response was that the problems were caused by the farmers.⁹⁸ However, the questions raised by pigs' sickness were never fully answered and it is unclear that the GM corn was *not* a cause of their sickness.⁹⁹

Another concern of *J.E.M.*'s critics is that the enforcement of intellectual property rights for seeds restricts access to genetic resources and impedes the diversification of germplasm that occurs when plant breeders have access to a wide array of genetic materials to develop new varieties.¹⁰⁰ This is because the legal and biological restrictions with which seed

⁹⁴ See Hamilton, *supra* note 86, at 46-7.

⁹⁵ See *id.* This has already occurred when Aventis brought a corn product that was not approved for food or feed use to market. The corn was not segregated (nor was the importance of that segregation conveyed to all the farmers who planted it or whose fields were near it) and Starlink Corn wound up in some taco shells by virtue of genetic drift. Farmers who had no idea the genes were in their corn became potential infringers of Aventis' patents. *Cf. id.*

⁹⁶ Crouch, *supra* note 47.

⁹⁷ Hamilton, *supra* note 82 at 46.

⁹⁸ *Id.* at 46.

⁹⁹ *Id.*

development companies can encumber their products prevent other developers from gaining access to them without paying a price.¹⁰¹ While the rationale for these restrictions is obvious in light of the effort, time, and money seed development companies spend on their new varieties (and the premiums that seed development companies can charge for their efforts), the result is a loss of genetic diversity because of an increased dependence on a small number of varieties within the various species of commercial crops.¹⁰² Historically, advances in plant breeding have occurred “upon the accumulated innovation of farmers who ensur[ed] a diverse genetic pool by expanding the germplasm base of modern agriculture through many years of experimentation and creation of thousands of new plant varieties.”¹⁰³ This could make it more difficult for farmers and breeders to react to changing conditions, such as the onset of a drought or disease, and render crops more amenable to large-scale failure.¹⁰⁴

There are also potential negative foreign policy consequences stemming from *J.E.M.*'s effect of encouraging the development and marketing of GM crops. As previously noted, European nations and consumers have been unwilling to accept the importation of GM foods.¹⁰⁵ While an increasing percentage of the U.S. food supply is genetically modified, European resistance to genetically modified foods forecloses a potential market for United States agricultural goods and exacerbates international tensions.¹⁰⁶ Furthermore, “the

¹⁰⁰ Roberts, *supra* note 24 at 113.

¹⁰¹ *Id.* at 115.

¹⁰² *Id.* at 113.

¹⁰³ *Id.* 115-16.

¹⁰⁴ *Id.* at 113.

¹⁰⁵ Hamilton, *supra* note 82, at 39.

¹⁰⁶ *Id.* (observing that such European resistance may be “a method of resisting what is seen as America’s attempted political and economic hegemony.”).

worldwide preservation of genetic diversity in plants is an important policy objective.”¹⁰⁷ The Supreme Court’s de facto endorsement of an agricultural policy directly at odds with the international goal of preserving genetic diversity (an endorsement arguably, although not incontrovertibly, inconsistent with constitutional imperatives) establishes another arena for potential conflict between the United States and the countries that widely use and produce GM crops and those that do not.

There are negative potential consequences for the business world as well. *J.E.M.* may have provided the seed industry with further incentive to consolidate.¹⁰⁸ By holding that utility patents may be granted to sexually reproducing plants, the Court arguably gave incentive for companies to “acquire control of basic materials, to limit access to those materials, and to seek further patent protection as a means of continuing control.”¹⁰⁹ Larger companies may be more likely to possess the resources to engage in the research necessary to support their patent applications and may be more able to litigate their patent claims. From 1995 until 1998, sixty-eight seed companies were acquired by or entered into joint ventures with six large corporations: Monsanto, Aventis, Dow, AstraZeneca, Novartis, and DuPont.¹¹⁰ The granting of absolute monopolies on varieties to a small number of companies has the potential to causing price increases, since the seed company can charge whatever price the buyer is willing to pay for a given plant variety.¹¹¹ As well, these companies have engaged in

¹⁰⁷ Roberts, *supra* note 24, at 114.

¹⁰⁸ *Id.*, at 115-16.

¹⁰⁹ *Id.* at 115.

¹¹⁰ *Id.*, citing JOHN L. KING, USDA, AGRIC. INFO. BULLETIN, NO. 763, CONCENTRATION AND TECH. IN AGRIC. INPUT INDUSTRIES 6 (2001), available at <http://www.ers.usda.gov/publication/aib763/>.

¹¹¹ *Id.* at 115.

litigation with seed distributors and farmers for violation of their seedwrap licenses.

Monsanto, for example, has filed hundreds of lawsuits against farmers.¹¹²

In sum, *J.E.M.* provided no answers to the critics of GM seeds and the foods and products they produced but provided every incentive to developers and growers to continue down their path. Subsequent lawsuits have continued offering extensive legal protection to the private developers of seed.

RECENT CASES:

In the wake of *J.E.M.* and the issuance of utility patents for seed, there has been an increase in the use of seed purchasing agreements between farmers and seed companies. Subsequent defendants (distributors and growers of seed) have attempted to attack the validity of seedwrap licenses and seed companies' pricing schemes. The relationship between farmers and seed development companies and between farmers themselves is frequently one that has become adversarial and litigious.

This portion of the Note focuses upon cases involving the Monsanto Company. This is because the company offers an excellent example of a corporation that has taken advantage of the changes in U.S. intellectual property law in order to secure a prominent place in its field. By the early 1990's, Monsanto engaged in genetic research involving the seed industry but was not yet involved in the production of seed.¹¹³ At that point, Monsanto had just developed its Roundup Ready ® technology for soybeans and technology that made corn seeds resistant to the destructive pest, the European Corn Borer.¹¹⁴ In 1992 and 1993, Monsanto, with its

¹¹² *Id.* at 117. "Monsanto has filed more than 475 lawsuits against farmers for patent infringement and violation of 'technology user' agreements for saving seed or selling or trading to fellow farmers." *Id.*

¹¹³ *Blades v. Monsanto Co.*, 400 F.3d 562, 567 (8th Cir. 2005).

¹¹⁴ *Id.*

patent-conferred monopoly in hand, granted licenses to Pioneer and Syngenta, to develop commercial seeds using this technology.¹¹⁵ The agreements did not materially restrict the pricing and development of the seeds.¹¹⁶ Subsequently, Monsanto became a major seed producer and licensed additional seed companies to produce seeds using its patented genes, while requiring payment of “technology fees” in order to use Monsanto’s patented technology.¹¹⁷

In *McFarling*, in which the defendant farmer was found to have saved soybean seeds in violation of a seedwrap license, the defendant contended that the license was unenforceable because patentee Monsanto had been exhausted upon the sale of the seed.¹¹⁸ Patent law’s exhaustion doctrine implicates both the exclusive rights of the patent owner to exclude all uses and the rights of the purchaser to use the product in its normal and customary manner.¹¹⁹ Granting summary judgment in favor of plaintiff Monsanto, The Federal Circuit relied upon recent jurisprudence that patent exhaustion can be negated explicitly by the license, as the agreement in question appeared to do.¹²⁰ The court reasoned that the seedwrap agreements covered the seeds actually sold and that the sale of the seeds did not confer an implicit or explicit license to “construct” new seeds by saving and replanting them, as the farmer had

¹¹⁵ *Id.*

¹¹⁶ *Id.*

¹¹⁷ *Id.*

¹¹⁸ *Monsanto Co. v. McFarling*, 302 F.3d 1291, 1298 (Fed. Cir. 2002) [hereinafter *McFarling I*].

¹¹⁹ *Burk*, *supra* note 89, at 354.

¹²⁰ *See id.*; *McFarling I*, 302 F.3d at 1299.

done.¹²¹ These new seeds (the second generation seeds planted by the farmer) were thus not subject to the exhaustion doctrine.¹²²

Dan Burk has criticized this holding for failing to answer the question of whether the patent holder's rights in the second generation seeds were exhausted.¹²³ Burk argues that the Court's holding that "the original sale of the seeds did not confer a license to construct new seeds"¹²⁴ does not make any sense given that soybeans are purchased in order to "construct" new seeds: these are the soybeans that are harvested.¹²⁵ What is actually at issue, according to Burk, is whether the license restricting the use of first generation seeds effectively constrains the use of second generation seeds.¹²⁶

The Federal Circuit affirmed its grant of summary judgment in favor of Monsanto.¹²⁷ The court reasoned that the license must be read to impose a prohibition on the use of second generation seed rather than first generation seed because a grower would plant and harvest the first-generation seeds the same way, whatever use she intended to make of the seeds.¹²⁸ The court reasoned that second generation seeds must necessarily fall within patent claims and that prohibitions on the planting or use of the seeds were within the patent's ambit.¹²⁹

¹²¹ *Id.*

¹²² *Id.*; Burk, *supra* note 89, at 354.

¹²³ *Id.* at 355.

¹²⁴ *McFarling I*, 302 F.3d at 1299.

¹²⁵ Burk, *supra* note 89, at 355.

¹²⁶ *Id.*

¹²⁷ *Monsanto Co. v. McFarling*, 363 F.3d 1336, 1352 (Fed. Cir. 2004) [hereinafter *McFarling II*].

¹²⁸ Burk, *supra* note 89 at 356 (citing *McFarling II*, F.3d at 1342).

¹²⁹ *McFarling II* F.3d at 1343; Burk, *supra* note 89 at 356.

In *Blades*, growers brought suit not under a theory that Monsanto's patents were invalid, but that the company had engaged in a price-fixing conspiracy in violation of section one of the Sherman Act.¹³⁰ Plaintiffs alleged that Monsanto, in licensing to the Pioneer and Syngenta companies, had surrendered the monopoly granted by the patent and they alleged that Monsanto had "secured the agreement of Pioneer and Syngenta to inflate the prices of their own GM corn and soybean seeds...rather than to undercut the fees through normal price competition."¹³¹ Plaintiffs further alleged that Monsanto bolstered its technology fee by limiting by agreement competitor Aventis' production of LibertyLink soybean seeds, which were in competition with the GM soybean seed sold by Monsanto, Pioneer, and Syngenta.¹³² Plaintiffs sought to bring a class action suit on behalf of farmers who purchased corn and soybean seeds from any of the defendants.¹³³

The District Court for the Eastern District of Missouri denied class certification to plaintiffs on a motion for summary judgment, finding that they did not satisfy the requirement of FRCP Rule 23(b)(3) that "common questions predominate over any questions affecting only individual members."¹³⁴ The Eighth Circuit, in affirming the motion for summary judgment, agreed with the district court.¹³⁵ The court held that some of the proposed plaintiffs who purchased the hybrids would have "to prove injury through evidence that would vary according to individualized market conditions and thus would not be shared in common with

¹³⁰ *Blades v. Monsanto Company*, 400 F.3d at 565.

¹³¹ *Id.*.

¹³² *Id.*

¹³³ *Id.* at 566.

¹³⁴ *Id.* at 569.

¹³⁵ *Id.* at 572.

the rest of the proposed classes.”¹³⁶ The Eighth Circuit affirmed the district court’s findings that the prices of genetically modified seeds varied widely and that some farmers paid small or non-existent premiums for the seeds and that the fact of injury could not be proven for the class as a whole.¹³⁷ Consequently, the court denied plaintiffs’ attempt to file a class action suit.¹³⁸

The *Blades* plaintiffs’ foundation for their complaint was the high prices they paid for their seed, prices which were allegedly the result of collusion.¹³⁹ While the court found insufficient proof of injury for a class as a whole, the fact of price increases is real.¹⁴⁰ “The cost of corn seed has increased from \$18.48... per planted acre in 1985 to \$30.29... per planted acre in 1999.”¹⁴¹ Likewise, “the price of soybean seed has increased from \$12.92... per planted acre in 1985 to \$19.25... per planted acre in 1999.”¹⁴²

In response to such price increases, farmers have been saving their seed as a check on the market and incurring legal consequences when seed development companies receive word of the practice. The seed-saving conflict arose again in *Ralph* when the Court of Appeals for the Federal Circuit upheld the striking of defendant’s pleading pursuant to FRCP 37(b), as

¹³⁶ *Id.* at 573.

¹³⁷ *Id.* at 572.

¹³⁸ *Id.* at 574.

¹³⁹ *Id.* at 565.

¹⁴⁰ *Id.* at 572.

¹⁴¹ Brief for Center for Food Safety as Amicus Curiae Supporting Defendants-Appellants, *Monsanto v. Scruggs* (citing USDA, Economic Research Service, Corn Costs and Returns Data, *available at* <http://www.ers.usda.gov/Data/CostsAndReturns/testpick.htm> (last updated Nov. 20, 2006)).

¹⁴² *Id.* (citing USDA, Economic Research Service, Soybean Costs and Returns Data, *available at* <http://www.ers.usda.gov/Data/CostsAndReturns/testpick.htm> (last updated Nov. 20, 2006)).

well as damages for patent infringement for saving approximately 1200 bags of soybean seeds and 900 bags of cottonseed for replanting over the course of two years.¹⁴³ Monsanto was suspicious that Ralph might have saved and re-planted seeds. Ralph initially asserted that he had not done interstate business in Missouri, as asserted by Plaintiff Monsanto.¹⁴⁴ The court agreed with Monsanto.¹⁴⁵ Ralph tried to evade liability by repeatedly lying under oath, failing to disclose his land holdings and failing to disclose that he had stored some of the cottonseed elsewhere.¹⁴⁶ Monsanto was forced to get a court order to enter his land in order to see if he had been saving seed.¹⁴⁷

In affirming the district court's striking of defendant Ralph's pleadings, the Court of Appeals found that defendant had willfully violated court orders, destroyed evidence, and suborned perjury and that in view of these facts the district court was not abusing its discretion when it struck his pleadings.¹⁴⁸ The court quoted the district court judge who characterized Ralph's conduct as a series of "lies...compounded upon lies."¹⁴⁹ While the case is notable for the exceptional, perjurious efforts the defendant took to prevent discovery of the facts, the case highlights the division between the seed developer and government on one side and the farmer on the other. The farmer is stuck between the obligations imposed by the law (in the form of the seedwrap license agreement she "signs" upon opening the bag of seed) and tradition and

¹⁴³ *Monsanto Co. v. Ralph*, 382 F.3d at 1377.

¹⁴⁴ *Id.* at 1378.

¹⁴⁵ *Id.*

¹⁴⁶ *Id.* at 1379-80.

¹⁴⁷ *Id.* at 1382.

¹⁴⁸ *Id.*

¹⁴⁹ *Id.* (citing Sanction Hearing Transcript, slip op. at 30-31).

profits on the other. This is a law whose new contours both create higher prices for her seed and penalize her for not availing herself of her traditional remedy for these higher prices, the practice of seed saving.

These recent cases illustrate the ongoing conflicts between seed developers and farmers. Limits on seed-saving chip away at what has been a historical right.¹⁵⁰ As well, seed-saving controls prices by depressing demand, which has obvious benefits for consumers or other later purchasers of the seed.¹⁵¹ The consequences of a seed company's allowing GM seed to escape may be substantial, as demonstrated by *Starlink*.¹⁵² On the other hand, seed developers like Monsanto have regulatory as well as legal and economic incentives to enforce their seedwrap licenses as the costs, both economically and environmentally of allowing GM seed to escape into the environment may be substantial. Now new varieties of seed are Roundup Ready(R) and/ or contain BollGuard(R) or the like. This is far removed from the days of the 19th and early 20th centuries, with their government-sponsored seed distribution program and the alignment of LGC's with movements toward seed certification. Today, by contrast, seed varieties are increasingly branded and identified with private entities rather than with any government program (although LGC's are still instrumental in seed development, in concert with private industry).

The results in the cases above may arguably promote the Constitutional goal of promoting the useful arts, despite the protests of some commentators. Courts affording multiple, overlapping schemes of protection essentially provide growers with the best of all

¹⁵⁰ Brief of Amicus Curiae Center for Food Safety, *supra* note 143.

¹⁵¹ *Id.*

¹⁵² *See supra* text accompanying note.

types, promoting the development of genetically modified crops. Nevertheless, defendants' assertion of antitrust/ misuse of patent arguments underscore commentators' concerns about the scope of protection afforded transgenic crops and their concerns about how the present law might negatively impact the environment and society.

CONCLUSION:

One of the principal causes of the present state of affairs are the holdings in *J.E.M.*, a holding whose reasoning is potentially flawed. By privileging the works of those who alter the gene directly, as *J.E.M.* has done, United States intellectual property law privileges one kind of agency—that of the biotech company with its sophisticated equipment and analysis—while discounting the thousands of years of human interaction, cultivation, and breeding of plants that produce what we think of as “soybeans” or “cotton” or “corn.”¹⁵³ This newly-privileged type of agency granted the Supreme Court's imprimatur, may not actually be promoting the useful arts. Ultimately, the Supreme Court may have overreached in deciding *J.E.M.* and subsequent lines of cases assiduously protecting the rights of developers may be incorrectly decided. Arguably, the debate over the merits and demerits of GM crops is one that should take place within the public sphere, rather than being slipped into our crops by judicial fiat. By upholding the seedwrap agreements, the courts in *McFarling* and *Blades* continue down this path.

¹⁵³ See generally, Aoki, *supra* note 14.