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Market Benefits from Plant Innovation**

by

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Licensing Restrictions and Appropriating Market Benefits from Plant Innovation

Jay P. Kesan*

Recent patent cases have come under fire with producers accused of seeking to maximize profits by undermining consumers' rights of sale.¹ Yet in the case of agricultural biotechnology, its reliance on patent law is more complex because of the unique reproductive qualities of its products. Some products require a great deal of technical innovation, but once acquired, they can be reproduced perfectly and then used or sold by the consumer without additional cost. At the same time, certain licensing agreements now prohibit farmers from carrying out long-standing practices on their farms. These issues have come to the forefront of patent law, because of cases brought forth by agbiotech firm Monsanto.² This talk addresses intellectual property concerns posed by licensing restrictions associated with the sale of seed and the problem of appropriating market benefits from plant innovation. Among some 1,200 cases that Monsanto has filed against infringers of its patent claims, only two have progressed significantly to the Federal Circuit: *Monsanto v. McFarling*³ has been heard in district court and Federal Circuit opinions, and

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¹ See, e.g., John Richards et al., *Panel I: Monsanto v. Scruggs: The Scope of Downstream Licensing Restrictions*, 16 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1025 (2006).

² See, e.g., *Monsanto Co. v. Scruggs*, 117 Fed. Appx. 729 (Fed. Cir. 2004); *Monsanto Co. v. McFarling*, 363 F.3d 1336 (Fed. Cir. 2004).

³ 363 F.3d 1336.

*Monsanto v. Scruggs*⁴ is still in litigation. In the case of *McFarling*, the Court of Appeals for the Federal Circuit upheld Monsanto's licensing agreements against Homan McFarling, a Mississippi farmer.⁵

Monsanto is an agricultural firm involved in seed production and agricultural biotechnology, including the production of genetically modified seeds. Seed producers, like Monsanto, have different contractual relationships with different types of farmers: those who use the seed for food and feed and those who plant it. For farmers who are seed producers, they enter straight-up, output contracts, in which Monsanto purchases all the output the farmers produce. They typically do not involve any patent issues. For farmers who use the seed primarily for food and feed, they are held by express license restrictions on seed bags, often referred to as a "bag-tag license" or a "seed-wrap license."

Monsanto has brought cases against farmers it believes have violated its bag-tag licenses.⁶ These licenses cover a bag of genetically modified seed that is insect-resistant, herbicide-resistant, or salinity-resistant. The particular gene in the seed that is susceptible to these factors has been modified. This genetically modified seed is then sold in a bag with a label, specifying that this seed can be used to produce food and feed, but cannot be used to grow more seed for planting. Farmers can plant the seed, but after harvest they must sell the leftover seed as food or feed; they cannot replant it.

Even with the bag-tag license, genetically modified seed is enormously popular: seventy percent of the soybean grown in the United States is genetically modified.⁷ Take, for instance, the specific example of Roundup Ready seeds from the Monsanto cases.⁸ These seeds have been genetically modified to resist a particular type of herbicide. If a farmer plants these seeds in the

⁴ 117 Fed. Appx. 729.

⁵ *McFarling*, 363 F.3d at 1338.

⁶ See, e.g., *Scruggs*, 117 Fed. Appx. 729; *McFarling*, 363 F.3d at 1340.

⁷ *Genetically Modified Crops in the United States*, Pew Initiative on Food and Biotechnology, Aug. 2004, <http://pewagbiotech.org/resources/factsheets/display.php3?FactsheetID=2> (last visited July 22, 2006).

⁸ *Scruggs*, 117 Fed. Appx. 729; *McFarling*, 363 F.3d 1336.

ground and sprays the farm with herbicides, then the herbicides kill all the weeds, but not the seeds. The seeds remain unaffected by the herbicides, because geneticists have located and inhibited the particular enzyme (EPSPS enzyme) in the seed that is susceptible to it. Roundup Ready seeds and the herbicide effectively rid the farm of weeds. Farmers benefit because yields increase. Studies have been done that show the many benefits of using Roundup Ready seeds. Therefore, it is not surprising that farmers behave rationally and want to buy these seeds.

Despite all these benefits, a problem emerges on the producer side. These Roundup Ready soybeans are self-pollinating; they breed true and, therefore, replicate perfectly. If a farmer buys a bag of soybean, then he can continue planting the soybean and producing perfect samples, almost digital copies, of the genetically modified seed simply by planting it. He is limited only by his ability to keep the seed clean and dry during the off-season; in other words, his ability to store it properly. Hybrid crops, on the other hand, act differently. If a farmer buys a bag of a genetically modified hybrid seed, such as corn, he might be able to use it a second time with some loss, but the third or fourth time, the crop yield will drop significantly. Hybrid seeds are not self-pollinating; they have built-in protection for the producer. Therefore, when producers sell self-pollinating seeds like soybeans, they will have to act to minimize replanting in order to achieve the same levels of protection that is built into hybrid seeds. It follows that producers will price the self-pollinating seed differently taking into account a certain number of replanting activities.

In the case of genetically modified seed, such price mechanisms accounting for “brown-bagging” may well result in pricing the seed too high for farmers. Monsanto, therefore, relies on the bag-tag licensing restrictions. Nonetheless, consumers are selling saved seed among themselves in direct infringement of the licenses. There are roughly 85 million acres of corn and soybean in the United States, and they are roughly equal to each other. Taking into account the differences between the amount of seed that is used in corn and soybean, the amount of soybean sold is considerably lower—many times lower—than corn. We have to assume that a significant amount of so-called “brown-bagging”

takes place to explain the difference. By the way, “brown-bagging” refers to farmers selling saved-seed because they sell it in plain, brown bags.

Does Monsanto have a right to prevent brown-bagging? Turning to the precedents, we find that the Federal Circuit decided in the 1992 case of *Mallinckrodt* that if a patentee goes beyond the physical or temporal scope of the patent grant, then that is impermissible.⁹ Later in the 1997 case, *Braun v. Abbott Labs*, the Federal Circuit provided a few examples of impermissible restrictions, such as using a patented product to try to control an un-patented product and going beyond the term of the grant.¹⁰ In the case of genetically modified seed, we have to look at the restriction itself and decide whether it is within or outside the patent grant.¹¹ Looking at the patent grant complies with some old Supreme Court cases, like the 1938 case of *General Talking Pictures*.¹²

Patent rights only apply to that which is described and claimed in the patent.¹³ Once we determine the limits of the statutory patent grant, then we can determine infringement, because the crucial point is that farmers cannot practice the patent claims. That means farmers cannot make, use, sell, or offer to sell a patented invention without a license. They may buy an article that is patented. If they buy an article with no restrictions whatsoever (*i.e.*, an unconditional sale), then they have paid for it and they have an “implied” license stating that they have obtained the purchased good free and clear of any restrictions.¹⁴ However, if they buy an article that is governed by a “bag-tag” or “seed-wrap” license, then the producer’s licensed right is exhausted, but other rights are not.

Consumers often have a choice to buy the product with or without a license. For articles governed by a license, the producer

⁹ *Mallinckrodt, Inc. v. Medipart, Inc.*, 976 F.2d 700, 704 (Fed. Cir. 1992).

¹⁰ *B. Braun Med. Inc. v. Abbott Lab.*, 124 F.3d 1419, 1426 (Fed. Cir. 1997).

¹¹ *Id.*

¹² *General Talking Pictures Corp. v. Western Elec. Co.*, 305 U.S. 124 (1938).

¹³ *See* 35 U.S.C. § 132(a) (2000).

¹⁴ *Aro Mfg. Co. v. Convertible Top Replacement Co. (Aro II)*, 377 U.S. 476, 484 (1964).

usually charges a lower amount; the consumer can pay a lower amount for an incomplete set of rights. In the *Lexmark* case, the price for re-usable printer cartridges that were governed by a license requiring the consumer to refill it through Lexmark was around 20 percent lower than the price of a printer cartridge that was not governed by a license.¹⁵ If the consumer wants all the rights, then the consumer can have an unconditional sale and pay a higher price. Whether or not this price discrimination makes economic sense, the producers are alienating a different set of property rights. Therefore, they should be able to price differentially. Differential pricing allows many more transactions to clear in the marketplace than is the case if only unconditional sales were allowed.

What happens if we do not enforce licenses? Then we force producers to charge higher prices, and then many transactions simply do not take place. Mark Patterson cautions us that in regards to price discrimination, the welfare effects are ambiguous.¹⁶ The welfare effects of price discrimination become ambiguous only if we do not properly monitor or control for the baseline. Consider the situation without price discrimination, when producers sell seed unconditionally at supra-competitive prices. Taking that to be the baseline, allowing price discrimination across different markets and products permits us to reduce some deadweight losses leading to an increase in social welfare. When the supra-competitive price is higher than the competitive price, those transactions between the competitive price and the supra-competitive price fail to clear. For example, in an unconditional sale, if the competitive price in a market for pencils is two dollars and the patented price is five dollars, then transactions between two and five dollars do not take place. In new markets with price discrimination, the product can be sold for a whole variety of prices corresponding to different uses; a number of new transactions can take place; a number of new markets are

¹⁵ *Ariz. Cartridge Remanufacturers Ass'n v. Lexmark Int'l, Inc.*, 421 F.3d 981, 983 (Fed. Cir. 2005).

¹⁶ John Richards et al., *Panel I: Monsanto v. Scruggs: The Scope of Downstream Licensing Restrictions*, 16 *FORDHAM INTELL. PROP. MEDIA & ENT. L.J.* 1025 (2006) (Mark Patterson, panelist).

created; and the welfare effects are positive when compared with the alternative.

One may also ask, in the case of seeds, why not permit seed saving? This is the “God-made-germplasm” argument. The simple problem is that it is just not true. The value chain in the modern food sector is enormously complicated. It begins with start-up agbiotech companies performing a great deal of research and development in genetics. University departments of agricultural-science and agricultural engineering have moved away from germplasm breeding toward work in genetics. These start-up agbiotech companies and universities provide their technologies to large life-science companies and large agriculture-equipment companies. By the time we arrive at a farmer, we are much farther along in the value chain. He takes advantage of all the genetically modified technologies that the start-up agbiotech companies, universities, and large-life science companies have worked on, and the benefits that accrue to him do not derive from his labor, innovation, or investment alone. In addition to genetically modified crops, the farmer uses new technologically advanced equipment, which further contributes to his higher yield. For example, these large agriculture-equipment companies build combines that are fitted with global positioning system (GPS) equipment. This equipment allows the farmer to plot crop yields—the width of the combines times four feet: six-foot-by-four-foot plots that allow the farmer to gauge precisely what the crop yields are. A complicated value chain continues downstream from the farmer: it goes to the grain elevator; from there, it goes to a food processor and so on; then it finally ends up with buyers/consumers.

We need a system where parties in the value chain in the modern food sector can share in the risks and benefits of R&D; then they can coordinate their activities as the product goes through the value chain, rather than enabling a system where one player takes all the risk, and another receives all the benefits. Allowing the farmer to save seed goes back to a simple principle: he is trying to reap where he did not sow. He is not the only person who has contributed to the enhanced yield. There are a number of other players who have done their part and have a right to get paid and have a right to benefit. We can argue about

whether the benefit to producers and others is commensurate with their innovation or not. This is exactly where the debate should be. For instance, what is covered by the patent claim at issue and what is not covered by the patent claim?

This rationale may be exclusive to agricultural biotechnology. The same protection extended to Monsanto may not apply to other companies, such as Lexmark. In my opinion, the patent issues in the *Lexmark* case, involving the illegal reconstruction of printer cartridges, were not squarely presented.¹⁷ Certain questions arise: Is this cartridge patented? What, exactly, is patented? What is the scope of the claim? But in the case of seeds, it is quite different: you have wholesale reproduction. There is no question that there is perfect replication. Distinguishing between legal repair and illegal reconstruction is less problematic when a consumer can re-create the whole genetically modified seed perfectly. Even in cases such as *Aro I* and *Aro II*, the U.S. Supreme Court continues to uphold that full-scale reconstruction is illegal.¹⁸

Licensing restrictions, likewise, may not work as well for other industries. Different industries and technological sectors rely on the patent system to varying extents to appropriate benefits from their innovations. Some industries use other means, other than licenses, to reap the benefits of their innovation. Certain industries employ the first-mover advantage or they rely on network effects to appropriate benefits from their innovation. Certain software products lock the consumer in, because the cost of changing to new software is too high. They may also appropriate benefits through other means, such as reputational capital, bundling sales and services, and so forth. These practices, however, do not work for seed companies. In the case of genetically modified crops that are self-pollinating, it is as if you bought a CD containing some software, and the CDs were replicating at night! The software industry, with their shrink-wrap licenses, would never allow that, and they have network effects and other practices to help them prevent customers from doing so. The producers of genetically modified seeds have no such protection. Hybrid crops, on the

¹⁷ *Lexmark Int'l*, 421 F.3d at 983.

¹⁸ See *Aro II*, 377 U.S. 476; *Aro Mfg. Co. v. Convertible Top Replacement Co. (Aro I)*, 365 U.S. 336 (1961).

other hand, have built-in protection. Therefore, when dealing with certain kinds of industries (such as agbiotech) and certain kinds of products (such as self-pollinating crops), producers are dependent on utility patent protection and enforcement to prevent free-riding and brown-bagging.

Before I conclude, I want to discuss contractual issues and intermediaries involved in the Monsanto cases.¹⁹ Then, I will turn to the role of the legislature in solving these complications and solutions proposed in other parts of the world. I have glossed over some contractual issues, in part, because seed producers are perfecting their notice requirements and contracts. They have learned from not providing proper notice in the past. Nevertheless, there are contractual issues, and conflicts have arisen over bag-tag licensing with intermediaries, like JEM Ag Supply, in the *JEM v. Pioneer* case.²⁰ In *JEM v. Pioneer*, the litigation came about because there were thousands and thousands of Pioneer seed bags that were found in JEM Ag Supply, and every one of these bags has a unique number to it, and based on those numbers, they found that JEM Ag Supply had not paid for them.²¹ Therefore, the relationship between some of these retailers and agbiotech firms, like Monsanto and Pioneer, is strained.

It is common in patent law for producers to sue intermediate players for contributory infringement and for actively inducing infringement—Sec. 271(b) and Sec. 271(c)—instead of going after the direct infringer, because the direct infringer is very often a customer. The enforcement of licenses becomes problematic for producers, because it involves suing customers. Most seed producers admit that they do not want to sue farmers. They are their ultimate customers, and they have longstanding relationships with them. Indeed, some of them, such as DuPont-Pioneer, as a matter of policy, refuse to do so. They may sue seed companies, but they do not sue farmers. However, Monsanto has gone after direct customers whereas DuPont-Pioneer has not.²² In short, there

¹⁹ *Monsanto Co. v. Scruggs*, 117 Fed. Appx. 729 (Fed. Cir. 2004); *Monsanto Co. v. McFarling*, 363 F.3d 1336 (Fed. Cir. 2004).

²⁰ *J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc.*, 534 U.S. 124 (2001).

²¹ *Id.* at 124.

²² *See, e.g., Scruggs*, 117 Fed. Appx. 729; *McFarling*, 363 F.3d 1336.

are other non-patent issues such as customer relations and public relation concerns that become relevant.

Before turning to solutions proposed in other parts of the world, let's consider the role of Congress in determining the validity and limits of the intellectual property rights of genetically modified seeds. Sexually reproduced plants are protected by this *sui generis*, legislatively created IP regime called the Plant Variety Protection Act (PVPA).²³ The interface between PVPA and the Utility Patent Act²⁴ has caused some confusion. The PVPA protects only the plant as a whole and, unlike utility patents, allows exceptions, like the breeding exception and the saving-seed exception. Utility patents protection, on the other hand, is more robust: it also covers individual components of the plant and the methods involved in plant innovation, like the actual transformation method and how the gene is introduced into the seed. Compared to the Utility Patent Act, the PVPA provides a narrow scope of protection.

Despite these differences between the PVPA and the Utility Patent Act, it has been urged, relying on a preemption argument, that Congress has acted in this area through the PVPA to provide IP protection, as in the argument made in *J.E.M. v. Pioneer* that went before the U.S. Supreme Court in 2001.²⁵ J.E.M. claimed that plant protection had already been provided by the PVPA and, therefore, utility patents should not be granted for plant innovation—a preemption argument.²⁶ Yet the argument did not succeed.²⁷ Instead, the Supreme Court held that utility patent protection is also available for plant innovation.²⁸ Perhaps Congress will have to revisit this issue to clearly establish what the PVPA covers and what it does not and how these two regimes work together. At present, we find state legislatures becoming involved and seeking to pass legislation to regulate contractual practices between seed producers and farmers.

²³ 7 U.S.C. §§ 2321–2372 (2000).

²⁴ 35 U.S.C. §§ 1–376 (2000).

²⁵ 534 U.S. 124.

²⁶ *Id.* at 125.

²⁷ *Id.*

²⁸ *Id.*

Other solutions have been proposed in the United Kingdom and South America that might provide some insight into how to reward innovators in R&D.²⁹ Peter Carstensen made an interesting suggestion about applying the U.K. PVPA in the U.S.³⁰ He explained how the U.K. regime allows farmers to save seed by charging them a fee through the seed cleaner.³¹ Most farmers would like the U.K. regime; however, the U.K. saving-seed regime only applies to small farmers, i.e., farmers who own less than a fixed acreage, say less than 150 acres.³² For example, if a farmer owns more than 150 acres, then he has to pay the seed producer; he cannot unconditionally save seed. Therefore, all the big farmers have to pay and the small farmers do not. Looking at the suits Monsanto has brought against farmers, we find that Mr. Homan McFarling was farming 8,000 acres,³³ and Mr. Scruggs was farming several thousand as well.³⁴ McFarling was saving 1,500 bushels of soybean—not a small amount.³⁵ Even under the U.K. regime, Montano could sue both of these farmers.³⁶ The PVPA,³⁷ which is based out of the international UPOV convention,³⁸ has certain compulsory exceptions and certain optional exceptions; hence these differences between countries emerge. Each country can tailor the UPOV legal regime according to its needs by choosing or opting out of the optional requirements.³⁹

Other countries are experimenting with having other people in the value chain pay the seed producers, other than the farmer. Argentina, for example, is the mirror image of the United States in the Southern Hemisphere, where northern Argentina looks like the southern United States. The crops that grow in northern Argentina

²⁹ See, e.g., Plant Varieties Protection Act, 1997, Ch. 66, § 10 (U.K.).

³⁰ Richards, *supra* note 16 (Peter Carstensen, panelist). See also Peter Carstensen, *Post-Sale Restraints via Patent Licensing: A "Seedcentric" Perspective*, 16 FORDHAM INTELL. PROP. MEDIA & ENT. L.J. 1053 (2006).

³¹ Carstensen, *supra* note 30.

³² See Plant Varieties Protection Act 1997, Ch. 66, § 10.

³³ *Monsanto Co. v. McFarling*, 363 F.3d 1336, 1339 (Fed. Cir. 2004).

³⁴ *Monsanto Co. v. Scruggs*, 117 Fed. Appx. 729 (Fed. Cir. 2004).

³⁵ *McFarling*, 363 F.3d at 1339.

³⁶ See Plant Varieties Protection Act, 1997, Ch. 66, § 10 (U.K.).

³⁷ 7 U.S.C. §§ 2321–2372 (2000).

³⁸ International Convention for the Protection of New Varieties of Plants, 1961, Paris.

³⁹ International Convention for the Protection of New Varieties of Plants, 1961, Paris.

are the same as those grown in the southern United States. Argentina is the second and third producer of soybean and corn in the world, respectively.⁴⁰ They were one of the few countries that embraced GM crops in the early 1990s. To ensure that the large life-science companies are paid in this arena, they are experimenting with imposing taxes on farmers' crops.⁴¹ We can argue about whether using taxes makes economic sense or not, but the purpose is not to impose the burden on the farmer and instead make others further down the value chain compensate the seed producers. Brazil is experimenting with payments from elevator operators—that is, other people, besides the farmer, who benefit from the higher yields of seed.⁴² The purpose is, once again, to establish mechanisms so that innovators are rewarded by others who are in a better position perhaps to bear the burden.

Whatever the outcome, a tremendous amount of activity is likely to be forthcoming in this area, perhaps in the legislatures, and definitely in the courts. The key issue remains how do you create a system where you can promote innovation; where you can share in the risks and benefits of R&D; and, at the same time, try to create new markets and permit the ability to alienate these much sought after products throughout society?

⁴⁰ Agribusiness, Argentine Republic Investment Promotion Agency, http://www.inversiones.gov.ar/sectors_invest.htm (last visited July 22, 2006).

⁴¹ *U.S.-Latin Accord on GM crops a timely warning for Australia*, THE GUARDIAN, Mar. 10, 2004, available at <http://www.cpa.org.au/garchve04/1174gm.html> (last visited July 22, 2006).

⁴² Rachel Melcer, *Monsanto Sees Sales Rise 22%; Posts Loss of \$97 Million*, ST LOUIS POST-DISPATCH, Jan. 8, 2004, available at [http://www.mindfully.org/Industry/2004/Monsanto-Loses-US\\$97M7jan04.htm](http://www.mindfully.org/Industry/2004/Monsanto-Loses-US$97M7jan04.htm) (last visited July 22, 2006).