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Note

*511 THE UNITED STATES AND IRAQ: PLANT PATENT PROTECTION AND SAVING SEED

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I. Introduction

United States courts interpret the Patent Act [FN1] to protect seed companies' interests in their patented seed varieties, preventing farmers from “saving seed” for reuse or resale. [FN2] “Saving seed” is the practice of saving seed yield from one harvest for future crop use. [FN3] Saving seeds for “brown bag sale” occurs when farmers purchase seed from seed companies, plant the seed in their own field, harvest the crop, and then sell the reproduced seed to other farmers for them to plant as crop-seed on their own farms. [FN4] Though the United States has entered into international treaties that explicitly protect a farmer's right to save seed for replanting, U.S. patent law functions to protect biotech companies from infringement on their protected genetic seed sequences. [FN5] Iraq is not yet party to any of the main international treaties affecting biotech seed companies and farmers, nor is Iraqi patent law well defined. [FN6] However, orders with the ***512** force of law, instituted by the Coalition Provisional Authority after the U.S.-led invasion of Iraq, [FN7] leave Iraqi farmers' ability to save seed in question. [FN8]

U.S. courts uniformly find that farmers are prohibited from saving seed from plants patented under the Patent Act. [FN9] While Congress enacted legislation to give effect to international treaties that defend farmers' rights to save seed, [FN10] the Supreme Court has found that these statutes do not conflict with the Patent Act. [FN11] Other countries differ in their interpretation of the intersection between national patent protection and international treaty protections. [FN12] This Note therefore proposes that the Coalition Provisional Authority's imposition of rules prohibiting saving seed preempted the Iraqi government from considering the issue. Given cultural differences, the struggle to emerge as a successful post-war State, and Iraq's unique agricultural needs, the Coalition Provisional Authority's rule on saving seed will likely be detrimental to Iraqi farmers.

In this Note, I will outline the kinds of patents that U.S. courts have interpreted to prohibit saving seed. I will then detail international treaties that address farmers' ability to save seed, followed by the analysis U.S. courts have applied to the question of saving patented seed. I will review ***513** Iraqi agricultural and patent issues both before and after the U.S.-led invasion of Iraq, focusing on U.S. initiatives that affected the ability of Iraqi farmers to save seed. Finally, I will argue that U.S. efforts to prohibit Iraqis from saving seed undermine an agriculturally successful sovereign Iraq.

II. The Biotechnological Patents in Saved Seed

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Soybean and wheat plants patented by companies like Monsanto and Asgrow constitute the majority of the plants at issue in U.S. litigation over the farmers' right to save seed versus the companies' right to protect their patents. [FN13] Patents protect aspects of seed companies' technology. For example, at issue in Monsanto v. McFarling [FN14] were two Monsanto patents that allow for more efficient weed control by modifying the soybean plant so that it is resistant to herbicide. [FN15] Monsanto's U.S. Patent No. 5,633,435 (the "'435" patent) covers a plant cell in the soybean containing a DNA molecule that encodes a genetically modified enzyme. [FN16] Monsanto's U.S. Patent No. 5,352,605 (the "'605" patent) covers a plant cell "containing a genetic promoter sequence that facilitates a plant's production of the modified enzyme." [FN17] This '605 patent protects the genetic trait in the seed developed by Monsanto. [FN18]

The patented plants at issue are transgenic organisms--they have had a gene inserted, deleted, or replaced, allowing for the function of genes within the plant to be determined. [FN19] "These modifications have contributed to biological knowledge and agriculture by adding valuable traits to plants." [FN20]

***514** In 2002, Judge Raymond Clevenger of the United States Court of Appeals for the Federal Circuit characterized the ascendancy of transgenic seeds, like Monsanto's Roundup Ready brand: "[I]n only a few short years since their introduction, Roundup Ready seeds now account for at least 66 percent of soybean acreage planted in the United States." [FN21]

III. International Treaty-Enacting Legislation

Several international treaties address the property interest in patentable plants and seeds as well as whether or not these interests should affect the ability of farmers to save seed.

A. International Union for the Protection of New Varieties of Plants and the Plant Variety Protection Act

The International Union for the Protection of New Varieties of Plants ("UPOV") is an intergovernmental organization. [FN22] Membership in the UPOV is purely voluntary. [FN23] The United States is a UPOV member. [FN24] Iraq ***515** is not currently a member. [FN25] Each state party to the UPOV is required to adopt measures necessary to implement the UPOV. [FN26] The Plant Variety Protection Act ("PVPA") [FN27] is U.S. legislation enacting the UPOV. [FN28]

In 1970, Congress passed the PVPA to provide developers of new plant varieties with "adequate encouragement" to yield new varieties for public benefit. [FN29] Unlike patents under the Patent Act, "but as permitted under the UPOV, the PVPA includes some important exceptions to a seed developer's control, such as a 'farmer's exemption' allowing farmers to save seed from a proprietary crop." [FN30] According to the Supreme Court, "[t]he PVPA extends patent-like protection to novel varieties of sexually reproduced plants (that is, plants grown from seed), which parallels the protection afforded asexually-reproduced plant varieties (that is, varieties reproduced by propagation or grafting) under Chapter 15 of the Patent Act." [FN31]

The developer of a novel variety obtains PVPA coverage by acquiring a certificate of protection from the Plant Variety Protection Office. [FN32] This confers on the owner the exclusive right for eighteen years to "exclude others from selling the variety, or offering it for sale, or reproducing it, or importing it, or exporting it, or using it in producing (as distinguished from developing) a hybrid or different variety therefrom." [FN33]

Congress enacted the PVPA to bring the United States into compliance with the UPOV. [FN34] Article 15 of

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the UPOV recognizes exceptions to the ***516** breeder's rights. [FN35] Article 15(1) lists compulsory exceptions: (1) acts done privately and for non-commercial purposes; (2) acts done for experimental purposes; and (3) acts done for the purposes of breeding other varieties. [FN36] Article 15(2) is an optional exception wherein a party-nation may, "within reasonable limits and subject to the safeguarding of the legitimate interests of the breeder," restrict breeders in order to permit farmers to save seeds of the protected plant for replanting purposes on their own land. [FN37] Interestingly, during the diplomatic conference to discuss the 1991 amendments to the UPOV, the Netherlands proposed removing the paragraph 2 "farmer's privilege" to save seed. [FN38] The U.S. delegate stated that his delegation would find it difficult to establish such a limitation on the farmer's privilege. [FN39]

Each ratifying state must give effect to the provisions of the UPOV. [FN40] Therefore, in order to participate in the UPOV, the United States was required to conform its plant variety protection law with the 1991 UPOV Act. [FN41] On October 6, 2004, the United States complied by implementing legislation that led to the enactment of the Plant Variety Protection Act Amendments of 1994. [FN42] In his letter of submittal recommending that the ***517** 1991 UPOV be transmitted to the Senate for ratification, Secretary of State Peter Tarnoff specifically noted to President Bill Clinton that the Act expressly permits member states to exclude farmers' practice of saving seeds from the reach of breeder rights. [FN43]

Per the 1991 UPOV, the PVPA was amended in 1994 to state that any person who saves seed produced by or descended from protected seed, and who uses that seed in the production of crop on his own land, is not infringing on any PVPA-protected breeder right. [FN44] Farmers can use this seed for their own future use, but cannot sell, trade, or transfer it to others for planting purposes. [FN45] The PVPA also provides that a farmer can save seed for sale in limited circumstances. [FN46]

The PVPA provides a more limited right to patent holders than the Patent Act because it applies only to sexually reproduced plants and contains research and farmer crop exceptions. [FN47] "Most notably, there are no [infringement] exemptions for . . . saving seed under a utility patent." [FN48] Despite variant scopes, the Supreme Court confirmed that the PVPA and the Patent Act do not conflict. [FN49]

B. World Trade Organization Agreement on Trade-Related Aspects of Intellectual Property Rights

The World Trade Organization's Agreement on Trade-Related Aspects of Intellectual Property Rights ("TRIPS Agreement" or "Agreement") bills itself as "the most comprehensive multilateral agreement on intellectual ***518** property." [FN50] The Agreement sets minimum standards, allowing member states to provide more extensive protection of intellectual property at their discretion. [FN51] The TRIPS Agreement requires member states to make patents available for all novel inventions, but provides three permissible exceptions to this basic rule of patentability. [FN52] It is acceptable to exempt plants and animals, but the Agreement still requires some system of protection. [FN53]

The Agreement requires that patents be available in areas of technology, including biotechnology. [FN54] Indeed, the hallmark of TRIPS is the indiscriminate expansion of intellectual property protection. [FN55] Article 27 of TRIPS instructs Members to the Agreement to "provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof." [FN56] Under TRIPS, bound countries must implement mechanisms facilitating an entity to claim legal rights in plants and plant products. [FN57] In some countries, including the United States, "plants can be covered by patent claims provided that the patent applications are able to meet all of the necessary standards and requirements that exist in that country for patentability." [FN58]

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With respect to farmer versus patent owner rights, some member states have pushed for amendment to the TRIPS agreement. At the July 1999 TRIPS Council session, the African Group [FN59] proposed revising the ***519** Agreement to provide for "the protection of the innovations of indigenous and local farming communities in developing countries" and "the continuation of the traditional farming practices including the right to save, exchange and save seeds, and sell their harvest." [FN60] The United States opposed this action. [FN61] The Council did not act on the African Group's proposal. [FN62]

The TRIPS Agreement applies to all World Trade Organization ("WTO") members, but the Agreement gives countries varying time periods to delay application of TRIPS provisions. [FN63] The transition periods vary according to a country's classification as developed, transition, or least-developed. [FN64] The Agreement does not require member states to adopt identical rules on protection of intellectual property--it is a "minimum standards" agreement. [FN65] The United States has been a member of the WTO since January 1, 1995 and is thus a party to the TRIPS Agreement. [FN66] Iraq applied for accession into the WTO in 2004, and in 2008, a WTO group published its support for Iraq's accession. [FN67]

***520** C. World Intellectual Property Organization

The World Intellectual Property Organization ("WIPO") "is a specialized agency of the United Nations" and is another organization that recognizes patent protection for plant and seed-based inventions. [FN68] WIPO and the WTO have a cooperative agreement, coordinating notification and implementation of laws and regulations. [FN69] WIPO passed the Patent Law Treaty to harmonize international patent applications. [FN70] WIPO also instituted a Development Agenda in 2004 to consider "how WIPO policy decisions influence the developing world." [FN71] WIPO's Development Agenda offers developing countries the opportunity to argue for limited intellectual property protection of new technologies. [FN72] The United States and Iraq are both WIPO member states. [FN73] However, Iraq is not a contracting party to the Patent Law Treaty. [FN74] The United States has signed the Patent Law Treaty, but as of yet, no enacting legislation has given the treaty domestic force of law. [FN75]

D. 2001 International Treaty on Plant Genetic Resources for Food and Agriculture

The Commission on Genetic Resources for Feed and Agriculture ("FAO") adopted the International Treaty on Plant Genetic Resources for ***521** Food and Agriculture ("Treaty") in November 2001. [FN76] The Treaty came into force on June 29, 2004 after ratification by forty governments. [FN77] The FAO states that the objectives of the Treaty are the conservation and sustainable use of plant genetic resources for food and agriculture. [FN78] Unlike other treaties, the FAO places greater emphasis on farmers' rights than on the need to protect biotechnological breeders. [FN79] The FAO Treaty explicitly states that it is not to be interpreted to "limit any rights that farmers have to save, use, exchange or sell farm-saved seed." [FN80] However, the FAO Treaty leaves the right of farmers to use saved seed to the sole discretion of national governments. [FN81] Iraq is not a party to the FAO Treaty. [FN82] The United States signed the Treaty on January 11, 2002, but has not ratified, acceded to, or enacted the Treaty. [FN83]

***522** E. United Nations Convention on Biodiversity--the Cartagena Protocol

The United Nations identifies the Convention on Biological Diversity ("CBD") as the "key global instrument

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for the conservation and sustainable use of biological diversity, and for the fair and equitable sharing of benefits arising from the use of genetic resources." [FN84] The CBD was formed during the United Nations Conference on Environment and Development's "Earth Summit" in Rio de Janeiro in 1992. [FN85] The CBD ushered in the Cartagena Protocol on Biosafety on September 11, 2003. [FN86] The Cartagena Protocol aims to ensure an adequate level of protection in the use and international transfer of modified organisms resulting from biotechnology. [FN87]

The U.S. Department of Agriculture noted that although the United States is not party to the CBD or the Cartagena Protocol, it did participate in negotiation of the text of the Protocol. [FN88] Indeed, the United States was a member of the unofficial, so-called "Miami Group," representing the major exporters of genetically modified seed and crops. [FN89] The U.S. interest in negotiation was to enable free trade of genetically modified product, including transgenic seed, without additional U.N. bureaucratic procedure. [FN90] Like the United States, Iraq is not a signatory to the Cartagena Protocol. [FN91]

***523** IV. U.S. Analysis

The U.S. courts' current position--that legislation enacting international treaties is consistent with protection afforded to patent holders by the Patent Act and does not mandate farmers' rights to save seed--was not inevitable. [FN92] The courts might have instead decided that when Congress amended the PVPA to reflect the 1991 UPOV, Congress evidenced intent to afford farmers more protection. [FN93] Nevertheless, the outcome of U.S. cases has been decidedly in favor of seed patent-holders. [FN94]

In Diamond v. Chakrabarty, the Supreme Court held that live organisms are patentable. [FN95] Diamond confirmed the patentability of genetically engineered organisms. [FN96] After the Diamond decision, seed companies began to use civil litigation to more aggressively protect their property rights under the PVPA. [FN97]

***524** In Asgrow Seed Co. v. Winterboer, the Supreme Court interpreted actions taken by Winterboer, a farmer, as "a step in marketing" Asgrow's protected seeds [FN98]--where such a marketing step contraindicates the limited circumstances that the PVPA allows farmers to save seed for sale. [FN99] Prior to the Asgrow decision, the PVPA was generally interpreted to mean that a farmer could save up to half the crop of a protected variety for planting. [FN100] The 1994 PVPA amendment in conjunction with the Asgrow decision reframed the exemption to mean that a farmer could only save the amount of seed of a protected variety necessary to plant on their own farm, based on past production history. That "a farmer [may] save[] seeds to replant his acreage, but [if he] for some reason changes his plans, . . . [and] instead sell[s] those seeds for replanting under the terms set forth," [FN101] that action is not allowed.

In 2001, the Supreme Court affirmed that the Patent Act's broad scope of patent protection included plants. [FN102] In J. E. M. Ag Supply, the Court considered an appeal taken from a judgment for Pioneer, the patent-holders of hybrid corn seeds. [FN103] The petitioners argued that Pioneer's patent was invalid because it was issued under the Patent Act. [FN104] Petitioners claimed that the PVPA was the exclusive means for protection of plant life. [FN105] The Court, however, found that newly developed plant ***525** breeds were validly protected by the Patent Act and that the PVPA did not narrow the scope of protection afforded to patent-holders. [FN106]

In April 2008, the United States District Court for the Northern District of Indiana in Monsanto Co. v. Parr, granted an injunction against a seed cleaning business for infringing Monsanto's '605 patented Roundup Ready technology. [FN107] Parr operated a mobile seed and grain cleaning business, scheduling appointments with

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farmers around the Lafayette, Indiana area to clean their seed. [FN108] Soybean seed is cleaned in order to prepare it for replanting. [FN109] Parr's cleaning service was thus a means for farmers to save seed from one crop harvest and replant those seeds for future crop. [FN110] The court granted Monsanto's request for an injunction against Parr. [FN111] The court found that Parr's seed cleaning services, in conjunction with his verbal representations to farmers that the Supreme Court's opinion in Asgrow Seed Co. v. Winterboer permitted farmers to save and replant their seeds, illegally induced farmers to infringe Monsanto's patent. [FN112]

***526** As is the case in many patent infringement cases involving saved seed, Monsanto required farmers to sign a licensing agreement. [FN113] The licensing agreement in Parr forbade growers from saving seed grown from their Roundup Ready crops or otherwise using saved Roundup Ready seed "for replanting in subsequent seasons." [FN114] According to courts, these licensing agreements are binding and restrict the party purchasing the seed from saving seed, irrespective of rights that might have been due farmers under the PVPA. [FN115]

For example, the Federal Circuit in McFarling v. Monsanto found that the Monsanto license's prohibition on saving seed did not impermissibly broaden the scope of its patent or constitute patent misuse. [FN116] The court characterized the PVPA and the Patent Act as "complementary," providing different rights and privileges. [FN117] According to the court, "the right to save seed of plants registered under the PVPA does not impart the right to save seed of plants patented under the Patent Act." [FN118]

***527** V. Iraq, Plant Variety Protection, and Saving Seed

The political future of Iraq is uncertain. What is certain, however, is that the people of Iraq will continue to rely on their agricultural sector for the foreseeable future. "Revitalizing a war-torn agricultural sector is essential to establishing a landscape in which peace may flourish." [FN119] Focus on Iraq's agricultural sector will benefit economic growth, social stability, and individual income--in addition to addressing food security for the masses. [FN120]

A. Pre-2003 Invasion

In the late 1970s, more than half of Iraq's total labor force was employed in the agriculture sector, contributing approximately eight percent of the country's gross domestic product. [FN121] Iraq's attempts to develop the agriculture industry (investing more than four billion dollars over a decade) proved ineffective. [FN122] As the oil sector grew, the number of Iraqis working in agriculture decreased. [FN123] Iraq's "fruitless disregard" for its agricultural sector was evidenced by increasing dependence on food imports. [FN124] Lack of up-to-date farming equipment and severe droughts further impinged Iraq's ability to support any resurgence in the agricultural sector. [FN125] The first Gulf War, resultant sanctions, and the dictatorial control of Saddam Hussein produced significant food shortages. [FN126]

***528** B. Coalition Provisional Authority

The Coalition Provisional Authority in Iraq ("CPA") governed the country in the interim between U.S. invasion and the June 30, 2004 re-declaration of Iraqi sovereignty. [FN127] The Transitional Administrative Law was the supreme law of Iraq during the transitional period between CPA control and Iraqi self-governance. [FN128] CPA orders retain the force of law in Iraq unless overturned by a democratically elected Iraqi legislature. [FN129] Among the stated initiatives undertaken by the CPA were to "ensure food security" and "to lay

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the foundation for an open economy by drafting . . . intellectual property laws and streamlining existing commercial codes and regulations." [FN130]

On April 26, 2004, CPA Administrator L. Paul Bremer issued Order Number 81 ("Order 81" or "Order"). [FN131] The "Patent, Industrial Design, Undisclosed Information, Integrated Circuits and Plant Variety Law" noted that the outstanding Iraqi Patent and Industrial Design Law did not meet "current internationally-recognized standards of protection." [FN132] Order 81 amended patent owner's rights to expand owner ability to prevent any use of product without patent owner authorization. [FN133] The Order provides ***529** for plant variety registration, and for the first time codifies a concept of ownership of biological material in Iraqi law. [FN134] The Order also enumerates acts, with respect to the propagation of registered plant varieties that require the authorization of the breeder. [FN135] Specifically, production, reproduction, or multiplication; stocking; or conditioning for the purposes of propagation are prohibited absent authorization of the breeder. [FN136] Any part of the plant obtained through propagation of the protected variety (including the seeds of the protected variety) is subject to those restricted uses. [FN137]

Order 81 goes on to say that varieties "essentially derived" from the registered plant variety, varieties "not clearly distinguishable" from the registered variety, and "varieties whose production requires the repeated use of the protected variety" are subject to the same protection given the initial registered variety. [FN138] Under the Order, the breeder's rights extend to acts of others in "further propagation" of the plant variety. [FN139]

Order 81 explicitly makes law the proposition that farmers are prohibited from reusing seeds of protected varieties. [FN140] The publication Grain stated in a 2005 press release that the plant variety provisions of CPA Order 81 have the practical effect of prohibiting Iraqi farmers from saving seeds for their own reuse or replanting. [FN141]

***530** C. U.S. Government Initiatives

The U.S. Agency for International Development ("USAID") has taken the lead in efforts to rebuild Iraq, and to this end, developed the Agriculture Reconstruction and Development for Iraq ("ARDI") program. [FN142] Part of the ARDI reconstruction work focused on stimulating agricultural production through introduction of equipment, fertilizer, and seed to Iraq. [FN143]

The U.S. military also distributed wheat seed in Iraq as part of "Operation Amber Waves." [FN144] U.S. soldiers stationed near Baghdad distributed hundreds of tons of seed and fertilizer as part of this initiative. [FN145] It is unclear what kind of seed was supplied to Iraqi farmers. In particular, it is unclear whether the seed distributed by Operation Amber Waves was patent-protected biotech company seed.

The U.S. Department of Agriculture ("USDA") stated that Iraq has the resources to re-develop a successful agricultural sector, so long as Iraqi leadership addresses the technological aspect, which is "still in the 1980s." [FN146]

D. Iraqi Outcomes

1. Patent/Treaty Interpretation

Professor Elizabeth Winston argues that the United States has the most expansive protection scheme for ag-

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ricultural biotechnology in the ***531** world. [FN147] If this is the case, the future of farmers' ability to save seed in Iraq, where statutory development is in flux, should be an open question. [FN148] For example, in Argentina, Monsanto struggled to prevent farmers from saving seed due to a lack of patent protection for transgenic biotechnological seed in Argentinean patent law. [FN149]

Iraq is not yet a WTO member, so is not bound by the TRIPS Agreement. [FN150] As part of Iraq's accession into the WTO, it must implement policies in line with WTO principles. [FN151] An attorney advisor in the U.S. Patent Office wrote a law, which went into effect in Iraq in 2004, aimed at helping Iraq meet WTO admission standards. [FN152] However, Order 81, prohibiting Iraqi farmers from saving or replanting any seed from varieties that breeders have claimed as their own, is more restrictive than U.S. law. [FN153]

***532** 2. Company Rights

Seed companies have an obligation to protect their investments. [FN154] Seed companies need variety protection to help fund research and development of improved varieties. [FN155] Monsanto has said vis-à-vis U.S. patent interpretation that the courts' affirmation of biotech interests in their product helps ensure "continued investment into the kind of research and development necessary to keep growers on the cutting edge of productivity. We believe strong intellectual property protection will encourage the investment needed to maintain continued crop improvement." [FN156]

Biotech industries struggle when introducing a product into developing (or crisis-ridden) countries, like Iraq, because these countries often lack the capability to effectively enforce contractual use provisions between farmers and companies. [FN157]

3. Farmers' Rights

Biogenetic agricultural technology has transformed modern agriculture, and, as in any industry, technological advances can work to disrupt settled practice and tradition. [FN158] The U.S. analysis of patent rights gives biotech companies control over the transgenic seeds they produce that trumps even the "eons-old traditional right of farmers to save seeds for future use." [FN159] This long-established agricultural custom allowing farmers to plant next year's crop "remains the primary method of obtaining seeds" in the developing world. [FN160] Developing nations improve the integrity of their crops through the continuing custom of seed-saving and brown bagging. [FN161] ***533** Even though transnational companies provide developing countries "an abundance of relatively inexpensive seeds," farmers in these countries continue to rely on saving seed. [FN162]

The timeworn notion that farmers have a right to save their seed from one year's harvest, for use in next year's crop, directly conflicts with transnational companies' patent rights in agricultural systems that rely heavily on rural seed saving--such as Iraq. Jason Barron notes:

> If farmers lose the right to save seed, they immediately become beholden to the corporate interests supplying them with the sterile seeds. This in turn means that the countries to which these farmers belong are subordinate to these corporations. Concerns over developed-developing country economic imbalances has led developing nations to view strong patent rights as a way for developed nations to extract more money from the developing world. [FN163] U.S. interpretation and enforcement of the PVPA cause problems for farmers when shortages of certified seed for farmers to plant occur. [FN164] These shortages are the reason most farmers would save seed in the first place. [FN165] Farmers' hands are tied if they want to retain their "brown bag sale" seed-saving ability; non-PVPA protected varieties are harder to find, and

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harder to maintain in a market saturated with higher-yield PVPA varieties. [FN166]

VI. Conclusion

Agricultural production in Iraq was collapsing before the 2003 U.S.-led invasion, [FN167] and the continued violence and unrest no doubt prevented immediate post-Saddam agricultural growth. U.S. initiatives to provide resources to Iraqi farmers therefore seem a necessary part of reconstruction.

While membership in organizations like the WTO would likely stimulate Iraq's economic growth (including growth in the agricultural sector), Order 81 restricts Iraqi farmer rights beyond that required by the WTO. If Iraq does not need regulations as stringent as Order 81 for ***534** membership to international organizations, then the Order effectively over-restricts farmers.

If the aim of the CPA's orders was Iraqi reconstruction, it seems counterintuitive to implement an order that hamstrings farmers. Iraq is part of the ancient Fertile Crescent--the birthplace of agriculture. [FN168] The year before the U.S invasion of Iraq, ninety-seven percent of Iraqi farmers relied on saved seed. [FN169] Therefore, while U.S. farmers who save seeds derived from patented plant products are classified as “pirates,” [FN170] the criminalization of such a significant portion of Iraqi farmers is premature.

Order 81's preemptive protection of genetic seed patents at the expense of farmer rights to save seed denies Iraq the right to fashion a patent law most responsive to its own needs. While U.S. courts uniformly find that federal patent law prohibits saving seed, ambiguities between international treaties, enacting statutes, and the Patent Act reveal that such U.S. court interpretation is not self-evident. The imposition of even stricter farmer restraints in Iraq without the benefit of Iraq's own judicial interpretation threatens the ancient practice of saving seed upon which Iraqi farmers--and by extension the Iraqi people--rely.

[FN1]. 35 U.S.C. § 101 (2006). The Patent Act states: “Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” Id. Section 161 of the Patent Act specifies:

> Whoever invents or discovers and asexually reproduces any distinct and new variety of plant, including cultivated sports, mutants, hybrids, and newly found seedlings, other than a tuber propagated plant or a plant found in an uncultivated state, may obtain a patent therefor, subject to the conditions and requirements of this title.

35 U.S.C. § 161 (2006).

[FN2]. See Mary Ann Liebert, CAFC Again Agrees You Can't Save Seed, 27 Biotechnology L. Rep. 221 (2008).

[FN3]. Farmers save seed for many reasons. Every year new hybrids and new varieties of seed are produced with specific varieties developed for different climates and different growing environments.... Some of these varieties will succeed, and some will fail. Therefore, to reduce risk of low yield and profitability, rather than gamble on one variety of seed, farmers choose to plant their fields with multiple varieties.... Prior to the introduction of genetically modified seed, saving seed was the usual practice among farmers since time immemorial.

Elizabeth I. Winston, Why Sell What You Can License? Contracting Around Statutory Protection of Intellectual Property, 14 Geo. Mason L. Rev. 93, 95 nn.9-10 (2006) (citations omitted). Saving seeds for “brown bag sale” occurs when farmers purchase seed from seed companies, plant the seed in their own field, harvest the

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crop, and then sell the reproduced seed to other farmers for them to plant as crop-seed on their own farms.

[FN4]. See Jay P. Kesan, Licensing Restrictions and Appropriating Market Benefits from Plant Innovation, 16 Fordham Intell. Prop. Media & Ent. L.J. 1081, 1083-84 (2006).

[FN5]. Monsanto Co. v. David, 516 F.3d 1009, 1013-14 (Fed. Cir. 2008), cert. denied, 129 S. Ct. 309 (2008).

[FN6]. Elizabeth Mirza Al-Dajani, Comment, Post Saddam Restructuring of Intellectual Property Rights in Iraq Through a Case Study of Current Intellectual Property Practices in Lebanon, Egypt, and Jordan, 6 J. Marshall L. School Rev. Intell. Prop. L. 250, 251 (2007).

[FN7]. Coalition Laws and Transition Arrangements During Occupation of Iraq, 98 Am. J. Int'l L. Rev. 601, 601 (Sean D. Murphy ed., 2004).

[FN8]. Sina Muscati, Terminator Technology: Protection of Patents or a Threat to the Patent System?, 45 IDEA 477, 505 (2005).

[FN9]. Liebert, supra note 2, at 221.

[FN10]. Plant Variety Protection Act, 7 U.S.C. §§ 2321-2371 (2009).

[FN11]. Monsanto Co. v. McFarling, 302 F.3d 1291, 1299 (Fed. Cir. 2002). Under the Supremacy Clause, treaties and statutes have equal weight. Whitney v. Robertson, 124 U.S. 190, 194 (1888). If a treaty and statute are deemed to conflict, the doctrine of “implied repeal” is applied--wherein the latter adopted document prevails over the earlier one. Id. However, courts strive to harmonize treaties and statutes. See, e.g., Estate of Burghardt v. Comm'r, 80 T.C. 705, 713 (1983). “[T]he intention to abrogate or modify a treaty is not to be lightly imputed to the Congress.” Menominee Tribe v. United States, 391 U.S. 404, 413 (1968). Implied repeal will only apply if there is no harmonious interpretation to the treaty and statute available. Cook v. United States, 288 U.S. 102, 120 (1933).

[FN12]. See A. Bryan Endres & Peter D. Goldsmith, Alternative Business Strategies in Weak Intellectual Property Environments: A Law and Economics Analysis of the Agro-Biotechnology Firm's Strategic Dilemma, 14 J. Intell. Prop. L. 237, 248 (2007). “The reality,” according to Endres and Goldsmith, “is that many nations lack institutional controls, such as robust intellectual property laws and effective court systems to enforce intangible property rights and contractual arrangements.” Id. In Europe, biotech company patent claims directed at specific DNA sequences have been contentious. Gareth Morgan et al., Expert Analysis of Recent European Developments: Cargill v. Monsanto, 27 Biotechnology L. Rep. 109, 112 (2008). Company claims that patentable gene sequences are the same kind of claims at issue in U.S. cases like Monsanto Co. v. David, 516 F.3d 1009, 1019 (Fed. Cir. 2008). Germany, France, and Luxembourg all expressly bar patent protection of gene sequences. Morgan et al., supra, at 113.

[FN13]. See Marguerite A. Hutchinson, Moving Beyond the WTO: A Proposal to Adjudicate GMO Disputes in an International Environmental Court, 10 San Diego Int'l L.J. 229, 236 (2008).

[FN14]. Monsanto Co. v. McFarling, 488 F.3d 973 (Fed. Cir. 2007).

[FN15]. Id. at 976.

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[FN16]. Id.

[FN17]. Id.

[FN18]. Monsanto Co. v. Parr, 545 F. Supp. 2d 836, 838 (N.D. Ind. 2008).

[FN19]. Samantha A. Jameson, A Comparison of the Patentability and Patent Scope of Biotechnological Inventions in the United States and the European Union, 35 AIPLA Q.J. 193, 242-43 (2007).

[FN20]. Id. at 243. One controversial biotech seed product is known as 'Terminator,' sterile seed, or genetic use restriction technology (GURT). Patented in 1998, this genetic technology "would make saving and replanting seeds to harvest a biological impossibility." Richard Caplan, The Ongoing Debate Over Terminator Technology, 19 Geo. Int'l Envtl. L. Rev. 751, 751 (2007). The Commission on Genetic Resources for Food and Agriculture ("FAO") found that GURT seeds posed a serious risk to farmers' security. Id. at 773. A former chairman of the FAO Council "and recipient of the World Food Prize, wrote that: 'In India ... use of the terminator mechanism will be disastrous from the socio-economic and biodiversity points of view, since over 80 percent of farmers plant their own farm-saved seeds."' Id. at 775.

[FN21]. Monsanto Co. v. McFarling, 302 F.3d 1291, 1301 (Fed. Cir. 2002) (Clevenger, J., dissenting).

[FN22]. Welcome to the International Union for the Protection of New Varieties of Plants, http://www.upov.int/index_en.html (last visited Jan. 30, 2010). The UPOV is headquartered in Geneva, Switzerland. The international convention establishing the UPOV was adopted in Paris in 1961, and was revised in 1972, 1978, and 1991. The stated purpose of the Convention is to protect new varieties of plants via intellectual property right. Mission Statement of the International Union for the Protection of New Varieties of Plants, http:// www.upov.int/en/about/ (last visited Jan. 30, 2010).

[FN23]. Patent Lens, Can IP Rights Protect Plants?, http:// www.patentlens.net/daisy/patentlens/1234.html (last visited Feb. 11, 2010). Unlike the World Trade Organization's TRIPS agreement, countries are "not obliged to join UPOV as a result of their affiliation with any other organization or the ratification of any specific treaty." Id.

[FN24]. Members of the International Union for the Protection of New Varieties of Plants 2 (2009), http:// www.upov.int/export/sites/upov/en/about/members/pdf/pub423.pdf [hereinafter 2009 Member Status] (listing the status of members on October 22, 2009). The United States became a UPOV member on November 8, 1981 and became party to the most recently updated Convention Act (the 1991 Act) on February 22, 1999. The United States is a party to the 1991 Act with a stated reservation pursuant to article 35(2). Id. Article 35(2) provides a limited exception for party nations to make reservations to the Convention, as per article 35(1), no reservations to the Convention are permitted. International Convention for the Protection of New Varieties of Plants, Mar. 19, 1991, available at http:// www.upov.int/export/sites/upov/en/publications/conventions/1991/pdf/act1991.pdf [hereinafter UPOV]. The U.S. reservation to the 1991 Convention was for the United States to continue providing protection for "varieties reproduced asexually ... by an industrial property title other than a breeder's right, [which] shall have the right to continue to do so without applying this Convention to those varieties." UPOV art. 35, P2(a). The 1991 Convention was entered into force with respect to the U.S. on Feb. 22, 1999. World Intellectual Property Organization, UPOV Notification No. 69 (Jan. 22, 1999), http://www.wipo.int/edocs/notdocs/en/upov/treaty_upov_69.html.

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[FN25]. 2009 Member Status, supra note 24.

[FN26]. UPOV art. 30.

[FN27]. PVPA, 7 U.S.C. §§2321-2371 (2006).

[FN28]. See Kesan, supra note 4, at 1090. “The PVPA, which is based out of the international UPOV convention, has certain compulsory exceptions and certain optional exceptions; hence these differences between countries emerge.” Id. “While the United States did not join UPOV until 1981, Congress enacted the PVPA eleven years earlier so as to be consistent with UPOV and in the process facilitate patent protection for plant breeders working at both a domestic and an international level.” Keith Aoki, Malthus, Mendel, and Monsanto: Intellectual Property and the Law and Politics of Global Food Supply: An Introduction, 19 J. Envtl. L. & Litig. 397, 421 (2004).

[FN29]. PVPA, 7 U.S.C. §§2321-2371. Before the PVPA was enacted, plants grown from seeds were statutorily excluded from patent protection under chapter 15 of the Patent Act. Asgrow Seed Co. v. Winterboer, 989 F.2d 478, 480 (Fed. Cir. 1993) (Newman, J., dissenting).

[FN30]. Dan L. Burk, DNA Rules: Legal and Conceptual Implications of Biological “Lock-Out” Systems, 92 Cal. L. Rev. 1553, 1557 (2004).

[FN31]. Asgrow Seed Co. v. Winterboer, 513 U.S. 179, 181 (1995).

[FN32]. 7 U.S.C. §§2421, 2422, 2481-2483.

[FN33]. 7 U.S.C. §2483.

[FN34]. Anne E. Crocker, Will Plants Finally Grow into Full Patent Protection on an International Level?--A Look at the History of U.S. and International Patent Law Regarding Patent Protection for Plants and the Likely Changes after the U.S. Supreme Court's Decision in J.E.M. Ag Supply v. Pioneer Hi-Bred, 8 Drake J. Agric. L. 251, 259 (2003).

[FN35]. UPOV art. 15.

[FN36]. Id. Under article 14 of the UPOV, the following acts require the authorization of the breeder with respect to propagating the protected plant material: (1) production or reproduction (multiplication); (2) conditioning for the purpose of propagation; (3) offering for sale; (4) selling or other marketing; (5) exporting; (6) importing; or (7) stocking the protected plant material for any of the above purposes. UPOV art. 14.

[FN37]. UPOV art. 15.

[FN38]. Summary Minutes, in Int'l Union for the Protection of New Varieties of Plants, Records of the Diplomatic Conference for the Revision of the International Convention for the Protection of New Varieties of Plants, Geneva, 1991, at 352 (1992) [hereinafter Summary Minutes].

[FN39]. Id. at 355.

[FN40]. UPOV art. 30.

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[FN41]. Under article 2 of the 1991 UPOV, the United States has the flexibility of providing UPOV-mandated plant protection by either Plant Variety Protection certificates, utility patents, or both. S. Treaty Doc. No. 104-17, at VII-VIII (1995); S. Exec. Doc. No. 105-15, at 3 (1998). The UPOV makes clear that member states can use any domestic legislative form of intellectual property protection law to carry out the UPOV mandates. UPOV arts. 2-4. The broad language of article 2, outlining the basic obligations of member nations, states only that each contracting nation "shall grant and protect breeders' rights." Id. When discussing the neutrality of article 2 in allowing member nations to choose the form of protection they will issue for plant varieties, minutes from the Diplomatic Conference for Revision of the International Convention reveal that UPOV drafters contemplated that "the variety was to be considered as a host for the patent, whatever its purport might be." Summary Minutes, supra note 38, at 212, 213. The United States delegation to this meeting added that the breeder did not have an unfettered right to decide for himself what type of protection to obtain in as much as "[t]he breeder only had the right which was permitted by him by the laws of the country in which he obtained or sought to obtain protection. To that extent, the sovereign decision of member states on how to protect plant varieties should be maintained." Id. at 215.

[FN42]. Plant Variety Protection Act Amendments of 1994, Pub. L. No. 103-349, 108 Stat. 3136 (1994).

[FN43]. S. Treaty Doc. No. 104-17, at VI (1998). President Clinton accepted Tarnoff's submission and transmitted the 1991 UPOV Act--with the article 15(2) exception for saving seed--to the Senate with a recommendation for favorable consideration. Id. at III.

[FN44]. 7 U.S.C. § 2543 (2009).

> [I]t shall not infringe any right hereunder for a person to save seed produced by the person 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 of a crop for use on the farm of the person, or for sale as provided in this section.

Id. In interpreting this section of the statute in Asgrow, Justice Scalia began by acknowledging

> at the outset that it is quite impossible to make complete sense of the provision at issue here. One need go no further than the very first words of its title to establish that. Section 2543 does not, as that title claims and the ensuing text says, reverse any "[r]ight to save seed"--since nothing elsewhere in the Act remotely prohibits the saving of seed.

Asgrow Seed Co. v. Winterboer, 513 U.S. 179, 185-86 (1995) (footnote omitted).

[FN45]. 7 U.S.C. § 2543 (2009).

[FN46]. Id.

[FN47]. Jameson, supra note 19, at 256.

[FN48]. J. E. M. Ag. Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 143 (2001).

[FN49]. Id. at 140.

[FN50]. World Trade Organization, TRIPS: A More Detailed Overview of the Trips Agreement, http://www.wto.org/english/tratop_e/trips_e/intel2_e.htm (last visited June 2, 2010).

[FN51]. Id.

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[FN52]. Id.

[FN53]. Id.

Members may exclude plants and animals other than micro-organisms and essentially biological processes for the production of plants or animals other than non-biological and microbiological processes. However, any country excluding plant varieties from patent protection must provide an effective sui generis system of protection. Moreover, the whole provision is subject to review four years after entry into force of the Agreement.

Agreement on Trade-Related Aspects of Intellectual Property Rights art. 27.3(b), Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, Annex 1C, Legal Instruments-Results of the Uruguay Round, 33 I.L.M. 1197, 1208 (1994) [hereinafter TRIPS]. The other permissible exceptions are for inventions contrary to morality, and inventions related to the diagnosis, therapy, and surgical treatment of humans or animals. Id.

[FN54]. Jameson, supra note 19, at 197.

[FN55]. Chidi Oguamanam, Intellectual Property Rights in Plant Genetic Resources: Farmers' Rights and Food Security of Indigenous and Local Communities, 11 Drake J. Agric. L. 273, 280 (2006).

[FN56]. TRIPS art. 27.3(b).

[FN57]. Id.

[FN58]. Patent Lens 101: Initiative for Open Innovation, http:// www.patentlens.net/daisy/patentlens/1234.html (last visited June 2, 2010).

[FN59]. World Trade Organization, Groups in the Agriculture Negotiations, http://www.wto.org/english/tratop_e/agric_e/negoti_groups&uscore;e.htm (last visited June 2, 2010). The following countries comprise the “African Group” coalition within the WTO: Angola, Benin, Botswana, Burkina Faso, Burundi, Côte d'Ivoire, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Djibouti, Egypt, Gabon, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Tunisia, Uganda, Zambia, and Zimbabwe. Id.

[FN60]. African Group, Council for Trade-Related Aspects of Intellectual Property Rights, Taking Forward the Review of Article 27.3(b) of the TRIPS agreement, IP/C/W/404, June 26, 2003, http://docsonline.wto.org (follow “simple search”; then search “Document Symbol” for “IP/C/W/404”; then follow “Preview (HTML)” hyperlink), as discussed in Paul Kuruk, Goading a Reluctant Dinosaur: Mutual Recognition Agreements As a Policy Response to the Misappropriation of Foreign Traditional Knowledge in the United States, 34 Pepp. L. Rev. 629, 679 (2007).

[FN61]. Id.

[FN62]. Id.

[FN63]. World Trade Organization, TRIPS Frequently Asked Questions, http:// www.wto.org/english/tratop_e/trips_e/tripfq_e.htm#Who'sSigned (last visited Feb. 11, 2010) [hereinafter TRIPS FAQ].

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[FN64]. Id. Developed countries were granted a transition period of one year. Developing countries were allowed four years. Transitional economies (in the process of transformation from centrally planned into market economies) were allowed four years. Least-developed countries were granted an eleven-year transition period. Id.

[FN65]. TRIPS FAQ, supra note 63.

[FN66]. World Trade Organization, Member Information--The United States of America and the WTO, http://www.wto.org/english/thewto_e/countries_e/usa_e.htm (last visited Feb. 11, 2010).

[FN67]. World Trade Organization, Working Party Reviews Iraq's Trade Legislation, Apr. 2, 2008, http://www.wto.org/english/news_e/news08_e/acc_iraq_ april08_e.htm. WTO working party members argued that Iraq's participation in the WTO would contribute to its integration into the world economy. Id. The WTO working party members assessed Iraq's conformity with WTO principles. Id. Iraq provided the working party with information on its trade-related aspects of intellectual property rights, specific to show Iraqi compliance with TRIPS. Id. In terms of the next step in Iraq obtaining membership into the WTO, the working party specified that “Iraq will update its legislative action plan, as appropriate, and will continue providing information to members.” Id.

[FN68]. World Intellectual Property Organization, What is WIPO, http:// www.wipo.int/about-wipo/en/what_is_wipo.html (last visited Feb. 11, 2010).

[FN69]. Agreement Between the World Intellectual Property Organization and the World Trade Organization, Dec. 22, 1995, available at http:// www.wto.org/english/tratop_e/TRIPs_e/intel3_e.htm.

[FN70]. World Intellectual Property Organization, International Treaties and Conventions on Intellectual Property, in WIPO Intellectual Property Handbook: Policy, Law and Use 301 (2d ed. 2004), available at http://www.wipo.int/about-ip/en/iprm/pdf/ch5.pdf#plt.

[FN71]. Jason A. Barron, Note, Genetic Use Restriction Technologies: Do the Potential Environmental Harms Outweigh the Economic Benefits?, 20 Geo. Int'l Envtl. L. Rev. 271, 295 (2008).

[FN72]. Id.

> Because the Development Agenda is governed by the consensus system, changes would have to be agreed upon by all members. This would mean that developing nations would have to convince countries like the United States that ... technologies that create a private IP right and/or create an environmental harm greater than any foreseeable benefit should be restricted. In the Development Agenda talks, developed nations have shown little support of any proposal that would restrict intellectual property rights.
>
> Id.

[FN73]. World Intellectual Property Organization, Member States, http:// www.wipo.int/members/en/ (last visited Feb. 11, 2010).

[FN74]. World Intellectual Property Organization, Contracting Parties, http://www.wipo.int/treaties/en/ShowResults.jsp?lang=en&treaty_id=4 (last visited Feb. 11, 2010).

[FN75]. World Intellectual Property Organization, Treaties Database-- Contracting Parties, http://www.wipo.int/treaties/en/Remarks.jsp?cnty_ id=1462C (last visited Feb. 11, 2010).

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[FN76]. Food & Agric. Org. of the U.N., Fact Sheet No. 8: History of the Treaty 1, available at ftp:// ftp.fao.org/ag/agp/planttreaty/factsheets/fs08&uscore;en.pdf.

[FN77]. Id.

[FN78]. Id. Comm'n on Genetic Resources for Food & Agric., Food & Agric. Org., United Nations, Biodiversity for a World without Hunger, http:// www.fao.org/fileadmin/templates/nr/documents/CGRFA/commissionfactsheet.pdf. The Treaty focuses on regulating all plant genetic material for food and agriculture to ensure continued ability to "feed the people." The FAO Treaty defines "plant genetic resources" as "any genetic material of plant origin of actual or potential value for food and agriculture." International Treaty on Plant and Genetic Resources for Food and Agriculture Commission on Genetic Resources for Food and Agriculture, available at ftp:// ftp.fao.org/docrep/fao/011/i0510e/i0510e.pdf. The FAO website argues that "[t]he future of agriculture depends on international cooperation and on the open exchange of the crops and their genes." Id.

[FN79]. History of the Treaty, supra note 76. The concept of "Farmers' Rights" was initially proposed by a Canadian NGO as a "new type of collective intellectual property rights, meant to counter and be a mirror image of plant breeders' rights." Keith Aoki & Kennedy Luvai, Reclaiming "Common Heritage" Treatment in the International Plant Genetic Resources Regime Complex, 2007 Mich. St. L. Rev. 35, 43.

[FN80]. International Treaty on Plant Genetic Resources for Food and Agriculture art. 9.3, June 29, 2004, available at ftp:// ftp.fao.org/ag/cgrfa/it/ITPGRe.pdf. Article 9.3 states that "[n]othing in this Article shall be interpreted to limit any rights that farmers have to save, use, exchange and sell farm-saved seed/propagating material, subject to national law and as appropriate." Id. Further, in the Preamble, the FAO Treaty specifies that the Contracting Parties affirm

> the rights recognized in this Treaty to save, use, exchange and sell farm-saved seed and other propagating material, and to participate in decision-making regarding, and in the fair and equitable sharing of the benefits arising from, the use of plant genetic resources for food and agriculture, are fundamental to the realization of Farmers' Rights, as well as the promotion of Farmers' Rights at national and international levels.

Id. See also Charles R. McManis, Teaching Current Trends and Future Developments in Intellectual Property, 52 St. Louis U. L.J. 855, 874 n.89 (2008).

[FN81]. Aoki & Luvai, supra note 79, at 53-54.

[FN82]. Legal Office Treaties, International Treaty on Plant Genetic Resources for Food and Agriculture, http://www.fao.org/Legal/TREATIES/033s-e.htm (last visited Feb. 11, 2010).

[FN83]. Id.

[FN84]. Kofi Annan, Message from Kofi Annan, The Convention on Biological Diversity from Conception to Implementation: Historical Perspectives on the Occasion of the 10th Anniversary of the Entry into Force of the Convention on Biological Diversity 1 (2004), available at http:// www.cbd.int/doc/publications/CBD-10th-anniversary.pdf.

[FN85]. Id. at 7.

[FN86]. Hamdallah Zedan, Introduction and Congratulations: Message from Hamdallah Zedan, The Convention

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on Biological Diversity from Conception to Implementation--Historical Perspectives on the Occasion of the 10th Anniversary of the Entry Into Force of the Convention on Biological Diversity (2004).

[FN87]. Convention on Biological Diversity, The Cartagena Protocol on Biosafety, Jan. 29, 2000, available at http:// www.cbd.int/biosafety/articles.shtml?a=cpb-01.

[FN88]. U.S. Dep't of State Bureau of Oceans, Int'l Envtl. & Scientific Affairs, Fact Sheet: Cartagena Protocal on Biosafety, July 21, 2003, http:// www.fas.usda.gov/info/factsheets/biosafety.asp.

[FN89]. Aaron Cosbey & Stas Burgiel, The Cartagena Protocol on Biosafety: An Analysis of Results (2000), available at http://www.iisd.org/pdf/biosafety.pdf.

[FN90]. Id.

[FN91]. Convention on Biological Diversity, Cartagena Protocol on Biosafety, Status of Ratification and Entry into Force, http:// www.cbd.int/biosafety/signinglist.shtml (last visited June 2, 2010).

[FN92]. Charles C. P. Rories, Does the U.S.P.T.O. Have Authority to Grant Patents for Novel Varieties of Sexually Reproducing Plants?, 83 J. Pat. & Trademark Off. Soc'y 737, 750-51 (2001).

[FN93]. Id.

Congress has not enacted a large number of laws pertaining to protecting sexually reproducing plant varieties; the only significant amendments to the PVPA of 1970 were made in 1994, primarily to bring the PVPA into conformity with the 1991 UPOV Act. However ... in both the 1970 and the 1994 statutes, Congress specifically provided exceptions to the scope of protection given for a sexually reproduced plant variety--for example, the ‘crop exemption’ that permits a farmer to save seed he has produced from protected seed and use it for planting the following season, without infringing.... Title 35 does not provide these exemptions to the protection provided by a patent for a sexually reproduced plant, and owners of patents for such plants may prevent farmers from saving and using protected seed, and stop breeders from using protected varieties to produce new varieties. In deciding the Pioneer v. J. E. M. Ag Supply cases, the district court and the Federal Circuit did not regard these differences as significant conflicts between the two forms of protection; however, the Court could view them as evidence that in enacting the PVPA, Congress created a specific regulatory scheme for protecting sexually reproduced plant varieties that has been abridged by the U.S.P.T.O.'s decision to grant patents that also provide exclusive rights for sexually reproduced plant varieties. The legislative record of the PVPA indicates that at the time that the PVPA was enacted, Congress did not recognize any existing regulatory mechanism for protecting sexually reproducing plant varieties.

Id. (citations omitted).

[FN94]. Monsanto Co. v. McFarling, 302 F.3d 1291, 1299 (Fed. Cir. 2002).

[FN95]. Diamond v. Chakrabarty, 447 U.S. 303, 303 (1980).

[FN96]. Id. at 305-06. The Court found that “anything under the sun that is made by man” is patentable subject matter under 35 U.S.C. § 101. Id. at 309. Jameson notes that the relevant distinction for patentability in Diamond is between products of nature and human-made inventions. Jameson, supra note 19, at 244.

[FN97]. Elizabeth I. Winston, What If Seeds Were Not Patentable?, 2008 Mich. St. L. Rev. 321, 330 (2008). Winston notes:

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The agricultural industry is a highly concentrated field with the majority of the economy controlled by three companies. Focusing in on the behavior of one such player, Monsanto, and one seed, Roundup Ready soybean seed, provides a window into the revolution in the seed industry that has been brought about by the innovative use of private ordering to protect seed.

Id. (citations omitted). Winston describes Monsanto's efforts to join the "inner circle" through aggressive and restrictive licensing of its technology. Id. Per Winston, companies like Monsanto can protect their patents under either the Patent Act or via breach of contract (claiming that farmers violate their licensing agreements when they save seed). Id. at 335. However, Winston does not consider potential implications of treaty supremacy from the United States' participation in the UPOV or other organizations with seed-saving provisions.

[FN98]. Asgrow Seed Co. v. Winterboer (Asgrow II), 513 U.S. 179, 182 (1995). The marketing action taken by the Winterboers was the derivation of

a sizable portion of their income from "brown-bag" sales of their crops to other farmers to use as seed. A brown-bag sale occurs when a farmer purchases seed from a seed company, such as Asgrow, plants the seed in his own fields, harvests the crop, cleans it, and then sells the reproduced seed to other farmers (usually in non-descript brown bags) for them to plant as crop seed on their own farms.

Id.

[FN99]. Id. at 186.

[FN100]. See Asgrow Seed Co. v. Winterboer (Asgrow I), 989 F.2d 478 (Fed. Cir. 1993).

[FN101]. Asgrow II, 513 U.S. at 191.

[FN102]. J. E. M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 130 (2001).

[FN103]. Id. at 124.

[FN104]. Id. at 129.

[FN105]. Id. at 129. Petitioners argued that Pioneer's plant patent under 35 U.S.C. §101 was invalid because both the Plant Patent Act of 1930 ("PPA") and the PVPA are more specific to plants than 35 U.S.C. §101 and therefore carve out subject matter for special treatment. Id. The Court noted that petitioners favored a holding that the PVPA was the only means of protecting plants because the PVPA provides exemptions for research and for farmers to save seeds for replanting--exemptions not present in the Title 35 utility patent protections. Id. at 29 n.1. The PPA protects asexually reproducing plants. 35 U.S.C. §§161-164 (2008). "Asexual reproduction occurs by grafting, budding, or the like, and produces an offspring with a genetic combination identical to that of the single parent--essentially a clone." J. E. M. Ag Supply, 534 U.S. at 132.

[FN106]. J. E. M. Ag Supply, 534 U.S. at 145. Writing for the Court, Justice Thomas stated that the argument that the PVPA evidenced Congress' intent to deny broader utility patent protection for certain sexually reproduced plants was unavailing for two reasons:

First, nowhere does the PVPA purport to provide the exclusive statutory means of protecting sexually reproduced plants. Second, the PVPA and §101 can easily be reconciled. Because it is harder to qualify for a utility patent than for a Plant Variety Protection (PVP) certificate, it only makes sense that utility patents would confer a greater scope of protection.

Id. at 138. Justice Breyer dissented with Justice Stevens joining. Id. at 147. Justice Breyer argued that the

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Patent Act did not cover the kinds of plants at issue. According to Justice Breyer, Congress intended the more specific statute (the PVPA) to exclude patent protection under §101 for plants to which the more specific statute refers. Breyer noted that prior to the enactment of the PVPA, a special Presidential Commission commented on the special problems raised by plant protection. Id. at 153. That Commission favored the development of a totally new plant protection scheme, recommending that "all provisions in the patent statute for plant patents be deleted." Id. (quoting President's Commission on the Patent System, To Promote the Progress of Useful Arts, S. Doc. No. 90-5, at 20-21 (1st Sess. 1967)). Breyer also notes the "important" exception to breeder's exclusive rights in the PVPA--the uninfringed right of farmers to save and replant seeds. Id. at 154.

[FN107]. Monsanto Co. v. Parr, 545 F. Supp. 2d 836 (N.D. Ind. 2008).

[FN108]. Id. at 839. As the Court explained, seed cleaning "is a process where a harvested crop is run through a mechanical cleaner that sifts rash such as stems, leaves, dirt, and broken/split seed from the whole seed." Id.

[FN109]. Id.

[FN110]. Id. at 840.

[FN111]. Id. at 844.

[FN112]. Id. at 842-43.

[FN113]. Id. at 838.

[FN114]. Id. The Roundup Ready agreement in Parr restricted the use of the purchased seeds to planting within a single commercial crop in one growing season. Id.

[FN115]. See Showmaker v. Advanta, 411 F.3d 1366 (Fed. Cir. 2005). The Court of Appeals for the Federal Circuit found that the purchasing agreement "contractually prohibited its buyers from saving or selling, for seed purposes, any grain products from its seed." Id. at 1369. Interestingly, the Showmaker court looked to the precise language in Advanta's licensing agreement to find that the PVPA was not implicated. Id. at 1368. "Advanta did not reference the PVPA, any issued PVPA certificates, or any pending applications for plant variety protection," nor did the license agreement use the specific terms of art that "notify prospective users that the PVPA's protections apply." Id. The court identified the phrases "Unauthorized Propagation Prohibited" and "Unauthorized Seed Multiplication Prohibited" as "precise statutory terms" giving rise to notice of PVPA protection. Id. at 1369. Showmaker's complaint stating that the Advanta licensing agreement language was sufficiently similar to PVPA phrasing, was dismissed. Id. at 1368. Because Advanta did not have a patent or PVPA certification on its seed, Showmaker sought to show that Advanta's licensing language impermissibly gave farmers notice that Advanta had rights under federal PVPA law. See id. at 1367. The court found that the contract language restricted Showmaker's use of Advanta's seeds because Advanta's license was deemed not to implicate the "precise statutory terms" of the PVPA. Id. at 1369.

[FN116]. Monsanto Co. v. McFarling, 302 F.3d 1291, 1298-99 (Fed. Cir. 2002). On January 7, 2008, the Supreme Court denied certiorari in the case. McFarling v. Monsanto Co., 552 U.S. 1096 (2008). This followed the Federal Circuit's affirmation of a holding against McFarling, finding the farmer guilty of patent infringement, enjoining him from using the seed and awarding Monsanto $375,000 in damages. Monsanto, 302 F.3d at 1300; Corporate Report: Monsanto Co., Sarasota Herald-Trib., Jan. 8, 2008, at 2D. The license for the use of the pat-

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ented seed restricted farmers from using the seeds for more than one season. Monsanto, 302 F.3d at 1293. Monsanto cites J. E. M. Ag Supply's finding that plants and seeds are patentable under §101, "independent of and in addition to rights under the PVPA." Id. at 1299 (citing J. E. M. Ag Supply, Inc. v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 143-44 (2001)).

[FN117]. Id.

[FN118]. Id. In another case in which the defendant farmer argued against Monsanto's Technology Agreement, the farmer argued that the patent or a gene sequence does not "entitle the holder of the patent to enforce its grant of exclusivity against growers of plant varieties that contain the gene sequence." Monsanto Co. v. David, 516 F.3d 1009, 1013 (Fed. Cir. 2008). Mary Ann Liebert has also summarized David's argument that Monsanto's patent covers the gene sequence, not the plants themselves. Liebert, supra note 2, at 221. In David's case, the gene sequence conveyed soybean resistance to the Roundup herbicide. 516 F.3d at 1011-12. David was a commercial farmer who signed a Technology Agreement with Monsanto. Id. at 1012. The Agreement stated that farmers must purchase new Roundup Ready seeds each harvesting season, rather than saving seeds from previous years' harvests, as they normally would. Id. David was ordered by the district court to pay Monsanto $786,989.43 in damages, though the appellate court remanded for a new damage inquiry. Id. at 1013, 1018-20. Monsanto claimed that David planted patented Monsanto soybeans that were improperly saved from the previous year's harvest. Id. at 1012. The district court found that David had "willfully infringed" Monsanto's patent by "planting saved seed from a prior year's crop." Id. at 1013.

[FN119]. Kevin S. Cox, Note, Planting Peace: Agriculture and Post-War Reconstruction in Iraq, 10 Drake J. Agric. L. 541, 543 (2005).

[FN120]. Id. at 542-43.

[FN121]. Id. at 545.

[FN122]. Id. In 1986, the agriculture sector had not increased its contribution to Iraq's total GDP. Id.

[FN123]. Id.

[FN124]. Id. Cox reports that Iraq was agriculturally self-sufficient in the 1950s, but by the 1980s food imports accounted for twenty-two percent of all imports. Id. at 545-46.

[FN125]. Id. at 546.

[FN126]. Id. at 546-50.

[FN127]. Press Release, Coalition Provisional Authority, Coalition Provisional Authority Historical Accomplishments 2003-2004 (June 28, 2004), available at http://www.cpa-iraq.org/pressreleases/20040628_historic_review_ cpa.doc.

[FN128]. Id. at 45.

[FN129]. Coalition Provisional Authority, Law of Administration for the State of Iraq for the Transitional Period, Mar. 8, 2004, available at http:// www.cpa-iraq.org/government/TAL.html.

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[FN130]. Press Release, Coalition Provisional Authority, supra note 127, at 4.

[FN131]. Coalition Provisional Authority Order Number 81: Patent, Industrial Design, Undisclosed Information, Integrated Circuits and Plant Variety Law (2004), available at http://trade.gov/static/iraq_memo81.pdf. An overview of CPA orders affecting Iraqi commercial law from the U.S. embassy in Iraq identifies that Order 81

> amends Iraq's patent and industrial design law to protect new ideas in any field of technology that relates to a product or manufacturing processes. The amendments permit companies in Iraq, or in countries that are members of a relevant treaty to which Iraq is a party, to register patents in Iraq. The amendments grant the patent owner the right to prevent any person who has not obtained the owner's authorization from exploiting the patented product or process for twenty years from the date of the patent's registration in Iraq. The amendments also allow individuals and companies to register industrial designs.

U.S. Department of Commerce, Overview of CPA Orders Affecting Iraqi Commercial Law (Oct. 28, 2004), available at http://www.trade.gov/static/iraq_ cpaoverview.pdf.

[FN132]. Coalition Provisional Authority Order Number 81, supra note 131, at 1. See also Theodore W. Kassinger & Dylan J. Williams, Commercial Law Reform Issues in the Reconstruction of Iraq, 33 Ga. J. Int'l & Comp. L. 217, 224 (2004). The authors state that CPA Order 81 provided Iraq "with a modern industrial property law." Id.

[FN133]. Coalition Provision Authority, Order Number 81, art. 12, available at http://www.cpa-iraq.org/regulations/20040426_CPAORD_81_Patents_Law.pdf. See also Al-Dajani, supra note 6, at 255-56. Al-Dajani notes that CPA Order 81 renamed the Iraqi Patent and Industrial Designs Laws and Regulations (No. 65 of 1970) to "Patents, Industrial Design, Undisclosed Information, Integrated Circuits and Plant Variety Law." According to Al-Dajani, Order 81 defines the term of a patent as ten years, though, as of 2007, the Iraqi patent office had yet to accept applications after the 2003 invasion. Id. at 255. Al-Dajani further notes that historically, "[i]ntellectual property piracy runs rampant in the Middle East," and "[m]any Arab countries, regardless of WTO membership, are classified in the United States Trade Representative ("USTR") Special 301 report under either the priority watch list or the watch list." Id. at 256.

[FN134]. Coalition Provision Authority, Order Number 81, art. 3, available at http://www.cpa-iraq.org/regulations/20040426_CPAORD_81_Patents_Law.pdf.

[FN135]. Id.

[FN136]. Id. art. 14.

[FN137]. Id.

[FN138]. Id.

[FN139]. Id. See also Laura Nader, Law and the Theory of Lack, 28 Hastings Int'l & Comp. L. Rev. 191, 203 (2005). Professor Nader argues that the CPA's orders "give preference to U.S. corporations over the development of Iraqi economy." Id. Nader characterizes Order 81 as prohibiting Iraqis from saving seed, finding that under the Order, Iraqis are only allowed to plant seed from licensed, authorized U.S. distributors. Id. She quotes one Iraqi as saying, "the day will come, sooner rather than later, when the Iraqis will shred Bremer's law, soak them in water and offer them to Bremer to drink." Id.

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[FN140]. Coalition Provision Authority, Order Number 81, art. 15, available at http://www.cpa-iraq.org/regulations/20040426_CPAORD_81_Patents_Law.pdf ("Farmers shall be prohibited from re-using seeds of protected varieties or any variety mentioned in items 1 and 2 of paragraph (C) of Article 14 of this Chapter.").

[FN141]. GRAIN, Against the Grain, Iraq's New Patent Law: A Declaration of War against Farmers (2004), http://www.grain.org/articles/?id=6 (follow "available in PDF" hyperlink). See also Dave Whyte, The Crimes of Neo-liberal Rule in Occupied Iraq, 47 Brit. J. Criminology 177, 181 (2007). Whyte claims that the CPA envisaged Iraq's membership in the WTO as a central aspect of its economic reform. Id. According to Whyte, Order 81 was part of this plan and "effectively outlawed the informal sharing of farm seed supply system that has survived in Iraqi farming for years. The order forced farmers to use the protected varieties sold to them by their 'owners,' the trans-national bio-firms, in line with the WTO patent regime." Id.

[FN142]. Cox, supra note 119, at 553.

[FN143]. Id.

[FN144]. Id. at 556.

[FN145]. Id.

[FN146]. Review Iraqi Agriculture: From Oil for Food to the Future of Iraqi Production, Agriculture, and Trade: Hearing Before the Comm. on Agriculture, 108th Cong. 35-36 (2004) (statement of H. Lee Schatz, Special Counsel for Iraq Reconstruction, Foreign Agricultural Service, U.S. Dep't of Agriculture). Schatz went on to testify that the USDA had "supported representatives of the U.S. wheat, rice, and pulse industry to meet with Government of Iraq buyers in Amman, Jordan ... to begin the process of clarifying and modifying contract terms uses by Iraq." Id. Schatz did not specify which companies were involved, and was likewise vague when he said that "[c]ontract terms are still an issue, but upcoming meetings with the U.S. industry will continue to work on those outstanding issues." Id.

[FN147]. Winston, supra note 97, at 322.

[FN148]. Iraqi constitutional law was historically prohibitive of private ownership of biological resources. GRAIN, supra note 141. Surveying Iraq's legal roots is essential to understanding the Iraqi judiciary's conception of property rights. See Dan E. Stigall, A Closer Look at Iraqi Property and Tort Law, 68 La. L. Rev. 765, 768 (2008). Though secular legal institutions predominated in pre-2003 Iraq, Islamic law did influence the Iraqi Civil Code and provides important cultural context. Id. Under the Iraqi Civil Code, any possession of material value is "property." Id. at 772. The Iraqi Code recognizes "the right to complete ownership of property." Id. "Under the Iraqi Code, perfect ownership vests the owner with the absolute right to dispose of his or her property through use, enjoyment, and exploitation of the thing owned, its fruits, crops, and anything the property produces." Id. (emphasis added). The Iraqi Code also allows that the right to use the fruits of a thing can be owned independently from the title of the original thing. Id. at 790. For the purposes of crop ownership, one interesting vestige of Ottoman law that still influences Iraqi legal doctrine is the concept of tassaruf. Id. at 797. Under tassaruf, the land owner has extraordinary power over his property and the crops and buildings thereon. Id. at 798. The Ottoman legal device of al musaqat also remains influential in Iraqi conception of property rights. Id. at 802-04. Al musaqat is a contract between the owner of a plant and a farmer. In return for cultivating the plant, the farmer is entitled to a share of the fruits. Id.

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[FN149]. Morgan et al., supra note 12, at 109.

[FN150]. World Trade Organization, Members and Observers, http://www.wto.org/english/theWTO_e/whatis_e/tif_e/org6_e.htm (last visited Feb. 11, 2010).

[FN151]. Working Party Reviews Iraq's Trade Legislation, supra note 67.

[FN152]. Cox, supra note 119, at 559.

[FN153]. Id. at 560. Linda Lourie is the U.S. Patent Office attorney who helped write the Iraq law. Id. Of the laws that would help Iraq "meet the standards required to join the World Trade Organization, one ... is protection of plant varieties." Id. at 559.

The WTO standard requires new plant varieties created by breeders to be treated like inventions, giving plant breeders or seed companies exclusive rights to the varieties they create. In April 2004, an order that Lourie helped write went into effect, prohibiting farmers from saving and replanting any seeds from varieties that breeders have claimed as their own. Groups are now protesting the order, which is far more restrictive than the American law that allows farmers to save part of their harvest and use the seed on their own farms. One advocacy group, known as Grain, ridiculed the law as a declaration of war against the Iraqi farmer because it encourages private control over plant varieties. Although the order doesn't restrict the use of traditional varieties that Iraqi farmers have been planting, the advocacy group is worried that the traditional varieties might begin to disappear, and Iraqi farmers would not be allowed to save or share seed from new varieties.

Id. at 559-60 (citations omitted).

[FN154]. Ron Smith, Plant Variety Protection Act Is Now Being Enforced, Sw. Farm Press, Jan. 16, 2007, http://southwestfarmpress.com/news/011607-protection-act/.

[FN155]. Id.

[FN156]. Glenn Hess, Supreme Court Backs Monsanto in Seed Patent Case, Chem. & Eng'g News, Jan. 9, 2008, http:// pubs.acs.org/cen/news/86/i02/8602news4.html.

[FN157]. A. Bryan Endres & Peter D. Goldsmith, Alternative Business Strategies in Weak Intellectual Property Environments: A Law and Economics Analysis of the Agro-biotechnology Firm's Strategic Dilemma, 14 J. Intell. Prop. L. 237, 239-40 (2007).

[FN158]. Id. at 243-44.

[FN159]. Katie Black & James Wishart, Commentary, Containing the GMO Genie: Cattle Trespass and the Rights and Responsibilities of Biotechnology Owners, 46 Osgoode Hall L.J. 397, 420 (2008).

[FN160]. Barron, supra note 71, at 272. "For example, ninety-five percent of the millet grown in Zambia comes from saved seed." Id. at 272-73 (footnote omitted).

[FN161]. Id. at 273. Barron states that Chinese farmers brown bag over fifty percent of their wheat seed. Id.

[FN162]. Id.

[FN163]. Id. at 283.

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[FN164]. Press Release, Coalition Provisional Authority, supra note 127.

[FN165]. Id.

[FN166]. Id.

[FN167]. Cox, supra note 119, at 544.

[FN168]. Volker Mrasek, The Not-So-Fertile Crescent: Climate Change Threatens Cradle of Civilization, Spiegel Online Int'l, Apr. 16, 2008, http:// www.spiegel.de/international/world/0,1518,547763,00.html.

[FN169]. Muscati, supra note 8, at 504.

[FN170]. See Adam Liptak, Saving Seeds Subjects Farmers to Suits over Patent, N.Y. Times, Nov. 2, 2003, at A18.

[FNa1]. Kelly Crosby grew up in Marion, Illinois, and moved to Chicago after graduating with her B.A. in Psychology and Sociology from the University of Notre Dame. In May 2010, she received her J.D. from Washington University School of Law. She would like to dedicate this Note to her father, Thomas F. Crosby III.
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