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Intellectual Property and Agriculture: The Case on Soybeans and Monsanto

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ESSAYS

INTELLECTUAL PROPERTY AND AGRICULTURE: *THE CASE ON SOYBEANS AND MONSANTO*

*Marcelo Dias Varella**

I.	INTRODUCTION	59
II.	INTELLECTUAL PROPERTY RIGHTS AND SEEDS IN INTERNATIONAL LAW	62
III.	THE MAIN DIFFERENCES BETWEEN PATENTS AND PLANT VARIETIES PROTECTION FOR FARMERS	65
IV.	THE BRAZILIAN LEGAL FRAMEWORK	67
V.	PATENTS RIGHTS ON GENES AND PLANTS THROUGH LAWSUITS AND UNIONIST PRIVILEGE	69
VI.	THE AGREEMENTS WITH INTERNATIONAL TRADERS BASED ON INTELLECTUAL PROPERTY RIGHTS.....	72
VII.	AGREEMENTS WITH COMPETENT SEED COMPANIES	73
VIII.	THE EXTENSION OF INTELLECTUAL PROPERTY RIGHTS THROUGH AGREEMENTS DIRECTLY WITH FARMERS.....	75
IX.	THE LEGAL BATTLE AMONG EUROPEAN IMPORTERS, FARMERS, AND MONSANTO: THE FALL LIKE A HOUSE OF CARDS.....	77
X.	CONCLUSIONS.....	81

I. INTRODUCTION

Developing countries had to implement intellectual property rights on agriculture after the creation of the World Trade Organization

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(WTO) in 1995. The Trade Related Aspects of Intellectual Property Rights agreement (TRIPS agreement), one of the WTO's treaties, requires members to adopt an *effective mechanism to protect plants either by patents or a sui generis system*.¹ I contend that developing countries have institutional weaknesses, which allow multinational companies to dominate their markets using intellectual property rights, even when these countries do not accept their patents. The ability for companies to extend their market share through such legal strategies is increased by the complexity of patent law (mainly in new legal areas, such as agriculture), the lack of knowledge among actors within the production chain and/or among judges deciding the hard cases, and the long timeline to conclude court cases in developing countries.

Additionally, I outline how applying intellectual property rights to seeds, which in some cases was conceived to stimulate innovation,² results in some of the seed companies controlling the international market. This observation is true regardless of which legal system is chosen to ensure the protection, patent or the less extensive International Union for the Protection of New Varieties of Plants (UPOV).

Indeed, in some cases, the control exerted by intellectual property rights is sufficient to dominate the national exportation market and therefore affects the world market.³ The sufficiency of the intellectual property rights' control is evident, particularly in markets characterized by the existence of an international debate on consumers' rights to choose their food, such as genetically modified (GM) soybeans.⁴ In these cases, the domination of productive markets results in considerable restraint in the production and, therefore, exportation of soybeans that are not genetically modified. This constriction eliminates

1. TRIPS: Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 27 para. 4, Apr. 15, 1994, 1869 U.N.T.S. 299, 33 I.L.M. 1197 [hereinafter TRIPS].

Members may also exclude from patentability: (. . .) (b) 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, Members shall provide for the protection of plant varieties either by patents or by an effective sui generis system or by any combination thereof.

Id. art. 27(3).

2. INTELLECTUAL PROPERTY MANAGEMENT IN HEALTH AND AGRICULTURAL INNOVATION: A HANDBOOK FOR BEST PRACTICES 10 (Anatole Krattiger ed., 2007) [hereinafter INTELLECTUAL PROPERTY MANAGEMENT IN HEALTH AND INNOVATION].

3. *Id.* The control over the biggest exports has a direct impact on the control over the global market.

4. Thomas Bernauer & Philipp Aerni, *Trade Conflict Over Genetically Modified Organisms*, in HANDBOOK ON TRADE AND THE ENVIRONMENT 183 (Kevin Gallagher ed., 2008).

the possibility of choice for consumers and agents of the importing countries.⁵

I intend to support these assertions through a case study. I demonstrate how one enterprise, Monsanto, increased its market share of the Brazilian production of soybeans and then dominated this market for more than ten years by using arguments of intellectual property rights in national courts. Monsanto filed patents on genes related to soy beans. Either the Brazilian National Institute of Intellectual Property (INPI) denied these patents or other companies contested them in the courts. Because most national courts are not fully knowledgeable on intellectual property law, the lawsuits took many years to resolve.

During this period, Monsanto was able to create a complex network of contracts based on legally disputed patents and the protection of varieties of plants. Monsanto's domination of the national market was delayed because the national judiciary and actors within the production chain in developing countries (such as Brazil) did not fully understand the technicalities of intellectual property law.⁶

However, as we shall see, in some cases this strategy backfires. I intend to criticize this strategy and illustrate its limitations over time. After ten years and many legal decisions, Monsanto could lose arguably the most important case in intellectual property rights today. While the popular 2012 case between Apple and Samsung resulted in compensations of \$1.05 billion,⁷ Monsanto's case could reach \$3.5 billion in compensations.⁸ Because Brazil is one of the world's largest exporters of soybeans,⁹ it is also an important market for studying intellectual property rights on seeds.

This Article is divided into various parts: first, a summary of the international legal framework related to intellectual property and seeds. Second, the principle legal and economic differences between the State's two main legal possibilities: plant variety protection and patents.

5. See Michel Fok & Marcelo Varela, *Evolution Rules for the Use of Transgenic Soy in Brazil: An Analysis by a Systemic Approach to Governance*, 27 POL'Y & PUB. MGMT. 3-34 (2010).

6. Cotricampo v. Monsanto Trial, 088/1.04.001125-7 before the House of Campo Novo, Challenge the Process, item 127 [hereinafter Challenge the Process].

⁷ Miyoung Kim, *Samsung to Add iPhone 5 to U.S. Lawsuits vs. Apple*, REUTERS, Sept. 20, 2012, available at <http://www.reuters.com/article/2012/09/20/us-samsung-apple-idUSBRE88J0H520120920>.

8. *Id.*; Challenge the Process, *supra* note 6. There are different figures for the amount of indemnification. First, there was a strong variation on the exchange rate between the U.S. Dollar and the Brazilian Real. Second, there is 1% per month interest rate plus inflation, which could add more than 20% per year. Third, only Monsanto has the precise numbers of whom and how much was paid in the last years.

9. Justino De La Cruz & David Riker, *Product Space Analysis of the Exports of Brazil*, 18 (U.S. Int'l Trade Comm'n Office of Econ., Working Paper No. 2012-06-A, 2012).

Third, a presentation of the Brazilian legal framework to demonstrate a possible outcome even if Brazil did not accept patents on seeds or patents on genes, but only plant variety protection. Fourth, the Monsanto legal strategy of making Brazil accept patents on plants and genes. Fifth, the top-to-bottom agreements with traders based on intellectual property rights. Sixth, the agreements with competent seed companies. Seventh, the agreements with warehouses, cooperatives, and individual farmers based on the creation of an effective database and the presumption of the validity of those intellectual property rights. Eighth, the farmers' reactions in European and Brazilian Courts, which demonstrate how fragile this strategy could be, based on the decision that results in billions of dollars in compensations against Monsanto.

II. INTELLECTUAL PROPERTY RIGHTS AND SEEDS IN INTERNATIONAL LAW

Brazil edited a law on intellectual property rights on biotechnological innovations just after the creation of the WTO, as a consequence of the TRIPS agreement.¹⁰ In regard to intellectual property rights on plant varieties, TRIPS grants the Member States the right to choose their own intellectual property rights system: UPOV or patents.¹¹ Most developing countries have chosen the UPOV system, which is considered the more favorable system to farmers and national seed companies.¹² At the time, due to the diversity in seed companies and, even more significantly, the number of farmers acting on their classic property right to sow the products of their harvests,¹³ the impact of adopting one type of intellectual property on seeds did not seem to be significant.¹⁴ Following this logic, the legislators approved a rule of intellectual property that hinders the protection through patents, giving the intellectual property holders the minimum of rights compatible with TRIPS.¹⁵

10. Lei No. 9.279, de 15 de Maio de 1996, Industrial Property Law, May 1996 (Braz.). The TRIPS agreement entered in *force* in January 1, 1995. TRIPS, *supra* note 1. Another law, the Plant Variety Protection Act, created a *sui generis* protection for plant varieties. Lei No. 9.456, de 25 de Abril de 1997, Plant Variety Protection Act, Sept. 1997 (Braz.).

11. TRIPS, *supra* note 1.

12. International Convention for the Protection of New Varieties of Plants [UPOV], *Members of the International Union for the Protection of New Varieties of Plants* (2012), <http://www.upov.int/members/en/pdf/pub423.pdf>.

13. Jeremy F. DeBeer, *Reconciling Property Rights in Plants*, 8 J. WORLD INTELL. PROP. 5, 6 (2005).

14. *Id.*

15. Marcelo Dias Varella, INTELLECTUAL PROPERTY EMERGING SECTORS: BIOTECHNOLOGY, PHARMACEUTICALS, AND COMPUTING ACCORDING TO LAW N.9279 OF

Intellectual property rights is a branch of law distinguished by the high level of legal techniques required and the significant economic interests involved. Among the major countries that are creators of technology, the impetus is frequently given by the United States, whether because of its jurisprudence development or by its analyses guidelines.¹⁶ European and Japanese law tend to follow the North-American legal framework.¹⁷ The innovating countries stimulate the development of the fields of patent rights due to the evolution of technology, as demonstrated by the introduction of the patentability of living organisms with the proliferation of biotechnologies.¹⁸ In this process, the United States and Japan decided the patentability of plants and genes, and, specifically for the United States, the patentability of plant varieties. Moreover, the approaches are different since companies make American farmers pay rates each year for the usage of patented genes. On the other hand, Europe forbids the patentability of plant varieties and has a legal system that is more favorable to the farmers who benefit from the right to plant by paying a much lower contribution to the patent-holder.¹⁹

At the international negotiation at the WTO, the innovating countries succeeded in approving a common basis regarding the patentability of the introduction of every invention in all technological areas. In relation to living organisms, innovators may patent genetically modified microorganisms, but States remain free to reject the patent on plants and animals. However, there is the necessity to envisage, for the plant varieties, an intellectual property right that can be *sui generis* but that needs to be efficient.²⁰

As there is nothing mentioning the patentability of the genes, two interpretations are possible. Innovating countries in biotechnology consider genes a chemical molecule, independent of the plant or animal it affects and, therefore, patentable. Other countries consider the genes *solely* as a part of the plant, and therefore not patentable.²¹ Because plants are nothing but a combination of DNA sequences, plants must be patentable because a patent on genes represents an indirect patent on

14.05.1996 (NEW PATENT LAW) (1996) [hereinafter INTELLECTUAL PROPERTY EMERGING SECTORS].

16. See, e.g., Eileen Kane, *Patenting Genes and Genetic Methods: What's at Stake?*, 6 J. BUS. & TECH. L. 1 (2010).

17. MARCELO DIAS VARELLA ET AL., INTELLECTUAL PROPERTY AND DEVELOPMENT (2005).

18. INTELLECTUAL PROPERTY EMERGING SECTORS, *supra* note 15.

19. Peter K. Yu, *A Tale of Two Development Agendas*, 34 OHIO N.U. L. REV. 465, 534 (2009).

20. TRIPS, *supra* note 1.

21. MARIE ANGÈLE HERMITTE, PLANT GENETIC RESOURCES AND THE LAW IN THE NORTH-SOUTH REPORT (2004).

plants.²²

Gene patents are models of intellectual protection that are more sophisticated than plant patents.²³ In the United States, plants are actually patentable as one object.²⁴ In order to allow different holders to have patents on the same plant for different functional characteristics, the U.S. Patent and Trademark Office, after discussing the matter in court, authorized the patent of plant genes.²⁵ Thus, every different genetic sequence gives the right to a new patent, like a machine with different parts. For instance, a plant can be subject to a patent on the DNA sequence to resist the cold, another one on faster growth, and a third one for the resistance to an herbicide. In other words, gene patentability allows not only for plant patentability, but also for the addition of several patents on the same plant for each new genetic sequence.²⁶

According to TRIPS, the obligation to accept patents on genes would be a threat to the absolute freedom to exclude patents on plants and animals.²⁷ The choice of gene patentability is not, therefore, a technical choice mandatory according to TRIPS, but a political choice of each country. Additionally, this multilateral treaty contains an important number of subjective expressions that leave room for different interpretations within the judicial hermeneutic of the member countries of the WTO.

This national discretion is the result of arduous negotiation during the treaty-making process. The countries that do not significantly innovate can thus choose, to some extent, to adapt their legal framework to their interests. Accordingly, the interests of the biggest worldwide agricultural producers and innovators rarely converge. The biggest agricultural producers, such as Brazil, Argentina, Australia, China, New Zealand, and India (still very timid innovators) want lenient intellectual property laws on their products so they can use genetically modified plants without paying excessive rates. These countries do not wish to use patented technologies, primarily to avoid exchanging currencies linked to the payment of rates for the licenses used.²⁸

22. See Yu, *supra* note 19.

23. *Id.*

24. Jim Chen, *The Parable of the Seeds: Interpreting the Plant Variety Protection Act in Furtherance of Innovation Policy*, 81 NOTRE DAME L. REV. 105, 121–22 (2005).

25. See generally Jeremy F. DeBeer, *The Rights & Responsibilities of Biotech Patent Owners*, 40 U.B.C. L. REV. 343 (2007).

26. Andrew W. Torrance, *Intellectual Property as the Third Dimension of GMO Regulation*, 16 KAN. J.L. & PUB. POL'Y 257, 279 (2007).

27. See INTELLECTUAL PROPERTY MANAGEMENT IN HEALTH AND INNOVATION, *supra* note 2, at 48.

28. Jeffrey Sachs, *A New Map of the World*, ECONOMIST, July 22, 2000, <http://www.economist.com/node/80730>.

Thus, international law gave countries the right to choose between two systems of intellectual property on plants: patents and variety protection. The differences between the patents on seeds and genes from plant varieties coincide with national legal and political choices.

III. THE MAIN DIFFERENCES BETWEEN PATENTS AND PLANT VARIETIES PROTECTION FOR FARMERS

Plants have a specific intellectual property system protection that allows the rights holder to control their commercialization. However, this control is not as encompassing as the protection for plants and DNA sequences that patents would provide. The majority of countries use the specific (*sui generis*) system, as determined by TRIPS.²⁹ European countries accept protection by plant patents not set in the vegetable variety mode. This is unlike the United States, which provides a double protection by both systems for the same vegetable variety.³⁰

The seeds sector earned a specific system due to the characteristics of the protected objects. Unlike other inventions, such as machines and computer software, living beings reproduce themselves naturally. The International Union for the Protection of New Varieties of Plants (UPOV) is an international organization linked to the World Intellectual Property Organization that manages intellectual property rights of plant varieties. Both organizations work in the same building.³¹ Similar to patents, the UPOV system has as a principle that farmers do not have to pay for each proliferation of protected plants. Rather, the farmers pay in a specific and less expensive way, with each country having implemented a different system of equitable reward in favor of the rights holder.³²

The systems also differ in the criteria and time of protection. With patent protection, scientific research on the patented object will often be permitted with the authorization of the rights holder. With UPOV protection, not only is the research possible without authorization of the rights holder, but new resulting plant varieties are also permitted as long as the plant variety obtained is different from the previous one. With patent protection, the period of protection is twenty years, while with

29. INTELLECTUAL PROPERTY MANAGEMENT IN HEALTH AND INNOVATION, *supra* note 2, at 59.

30. See Jay P. Kesan & Mark D. Janis, *Intellectual Property Protection for Plant Innovation: Unresolved Issues After J.E.M. v. Pioneer*, (Ill. Pub. Law & Theory Research Paper No. 03-01, 2003) (showing that the case was rediscussed in the United States after *J.E.M. v. Pioneer*).

31. See UPOV, *What It Is, What It Does*, UPOV Pub. No. 437 (Jan. 5, 2013).

32. See UPOV, UPOV CONVENTION OF 1978 art. 5, Oct. 23, 1978.

UPOV protection the duration can vary according to the species. The criteria to grant the rights are also distinct. With patent protection, the object must be new, have inventive activity, and be likely to be inserted in an industrial process. On the other hand, in order to be protected by the UPOV, the plants must be homogeneous, stable, and different from other known plants.³³

The two forms of protection also have different gains on investments as patent protection allows for more accessible gains. In fact, in the agricultural field, farmers buy their seeds and in some countries, they produce their own seeds without having to pay for them again. In Europe, a farmer can do this; however, he needs to pay an “equitable contribution” to the rights holder. Nevertheless, if there is a seed patent, for each new crop, farmers have to pay royalties according to the amount harvested. That is, the return on one patented seed occurs multiple times, regardless of whether or not the farmer returned to the seed market.³⁴

Under the UPOV system, farmers can acquire new seeds for free, except in some regions and countries in Europe that charge a mandatory equitable contribution. Moreover, farmers can use the seed that they planted, but cannot sell it. Additionally, an important characteristic of the protective system of vegetable variety is that farmers generally cannot charge for the sale of their grains. However, if the farmer obtained the grain by evading the breeder’s rights, that is, a) without having paid for the seed when first acquired, or b) the subsequent annual contributions (as indicated by the system), or c) more commonly with the sales of seeds, then the farmer may charge for the sale of his or her grains.³⁵ Thus, if a plant is sold as a grain that is to be processed or consumed by the target market and not as a reproductive material, intellectual property rights prohibit the breeder from interfering in their commercialization. The rights of the patent holders are even more meaningful for a patent of genetic sequences, as each genetic sequence of the same plant could have a patent. The system also applies if the original variety characteristic is lost (for instance, in the case of other varieties crossing). If the patented genetic sequence is present in the new plant, then the holder will have the rights on the crossed plant because the genetic sequence continues in this new plant.³⁶

33. The criteria for protection under UPOV norms are different from patents. Plants must be distinct from other plants, stable in different generations, and homogenous. There are also different UPOV Conventions. Most countries adopt the 1978 Convention, while some others follow the 1991 Convention, which accept also a cumulative protection with patents. *Id.*

34. Chen, *supra* note 24, at 125.

35. Max Stul Oppenheimer, *The ‘Reasonable Plant’ Test: When Progress Outruns the Constitution*, 9 MINN. J.L. SCI. & TECH. 417, 427–28 (2008).

36. See Chen, *supra* note 24, at 127.

On this matter, the example of RR soybean from Monsanto is interesting. In the United States, the resistant gene of the herbicide *Roundup Ready*, manufactured by Monsanto, and the variety in which it is inserted was patented. In Brazil, however, it is not the variety produced by Monsanto that is commercialized, but another variety that results from the natural crossing between the Monsanto variety and the Brazilian soybean varieties (ironically called Maradona seeds by Brazilian farmers³⁷). However, in the final variety planted in Brazil, there is the genetic sequence responsible for the resistance to the herbicide, a patented sequence in the United States. When applying the model of relative patentability solely on plant varieties, Monsanto's rights could be guaranteed on the variety used in Argentina, for example, but not on the variety used in Brazil. On the other hand, when applying the model of DNA sequence patentability, Monsanto's rights would be guaranteed on Brazilian varieties as well.

Thus, most innovators adopt patents because patents are more profitable. Most countries adopt the patent system because their international commitments require them to have some intellectual property law.

IV. THE BRAZILIAN LEGAL FRAMEWORK

Brazil, which is one of the world's largest agricultural exporters, adopts plant variety protection. In Brazil, the Law n.9.279 of 1996 regulates biotechnological inventions, in articles 10 and 18. The Law establishes, *a priori*, the patentability of all inventions.³⁸ Later, the law defines what Brazil considers an invention, consequently excluding everything not considered as an invention from patentability. Article 10 stipulates:

Does not consider as invention or utility model:

I – discoveries, scientific theories and mathematical methods;
 X – all or part of natural living beings and biological material found in nature, or isolated therefrom, including the genome or germplasm of any natural living being and the natural biological

37. Vladimir Brandão & Jaime Luccas, *The Advantages and Dangers of the Soybeans 'Maradona'*, GLOBORU AL, available at <http://revistagloborural.globo.com/GloboRural/0,6993,EEC517911-1484-5,00.html> (last visited Apr. 10, 2013).

38. Lei No. 9.279, de 15 de Maio de 1996, Industrial Property Law, May 1996 (Braz.) [hereinafter Industrial Property Law] art. 8°.

processes.³⁹

Line I above is important because it excludes discoveries from patentability. In the United States, the concept of discovery is interpreted very differently than it is in Brazil. In the United States, for instance, the simple isolation of chemical properties of a plant is enough to consider the plant as no longer being pre-existent in nature, therefore granting patent rights to those responsible for the isolation.⁴⁰

Line X is clearer concerning living beings. Living beings found in nature are not considered inventions in their whole or in their parts. Article 18 defines non-patentable matter. The legislature made a political choice allowed by the TRIPS agreement that living beings or parts of living beings are not patentable, with the exception of transgenic microorganisms. Here, the expression “natural living being” was abandoned, leading to the belief that every gene, whether from a natural living being or not, is not patentable. To avoid inaccuracy in what is considered a transgenic microorganism, the sole paragraph, which was discussed at length during the legislative process, excludes from patentability all or part of plants or animals. Thus, the sole paragraph would exclude cells or plant genes, whether genetically modified or not, presented in the shape of a microorganism from patentability.⁴¹

According to Article 18:

Are not patentable:

III – all or part of living beings, except for transgenic microorganisms which meet the three requirements of patentability – novelty, inventive activity and industrial relevance – foreseen in art. 8° and which is not a simple discovery.

Sole Paragraph. For the purposes of this Law, transgenic microorganisms are organisms that, except the whole or part of plants or animals, express through direct human interference in its genetic structure, a feature that is normally not attained by the species under natural conditions.⁴²

Article 18 complements Article 10, since the legal text does not allow partial interpretation. A systemic interpretation clearly illustrates that the law prohibits patents on genes, even when a human being

39. *Id.* art. 10.

40. Jay P. Kesan & Mark D. Janis, *U.S. Plant Variety Protection: Sound and Fury . . . ?*, 39 HOUS. L. REV. 727, 730 (2002).

41. See TRIPS, *supra* note 1.

42. Industrial Property Law, art. 18.

performs a genetic modification on living beings, plants, animals, or a part of them (plant stems, animal and human being organs, cell tissue, or genes). These are not patentable objects, even if they result from genetic engineering.

In 1997, one year after the patent law, Brazil published the law n.9.456 on plant varieties protection. Article 2 clearly states:

Art. 2 The protection of intellectual property rights related to plants varieties is carried out by awarding Certificate of Plant Variety Protection, considered a commodity for all legal purposes *and it is the only form of protection of plant varieties that by law can inhibit the free use or reproduction of plants, parts of plants or vegetative propagation, in Brazil.*⁴³

Even though Brazil chose to protect plants through plant varieties protection, Monsanto was still able to enforce patents of plants and genes through an interesting legal strategy involving national and international actors.

V. PATENTS RIGHTS ON GENES AND PLANTS THROUGH LAWSUITS AND UNIONIST PRIVILEGE

Monsanto initiated its activities in Brazil in 1930. However, for the last 15 years, it has been increasing its investments to expand its regional market dominance. In Brazil, Monsanto controls the firms Monsanto Participações, Monsoy, and Monsanto Nordeste.⁴⁴ Having soybeans as its main export product, an important growth in their benefits seems logical. The soybeans cultivated in other countries results from public and private investments in technology for the past fifty years, creating dozens of different varieties that adapt to the different regional conditions of production of each country.

It is in this panorama that Monsanto gradually increased its influence. First, it developed a control policy on the Brazilian production of seeds by acquiring Brazilian firms that produce seeds. A few years ago, Monsanto acquired the firm Agrocere, the biggest seed producer in the country, and restructured the firm, creating Monsoy of Brazil. Monsanto acquired many other firms and incorporated them into the holding. By buying local competitors, Monsanto was able to acquire, at the same time, their germplasm. Therefore, the genetic basis

43. Lei No. 9.456, de 25 de Abril de 1997, Plant Variety Protection Act, Sept. 1997 (Braz.) art. 2.

44. Challenge the Process, *supra* note 6. This information was given to SEAE by the firm. Fok & Varella, *supra* note 5, at 4.

adapted to the climate and adverse technologies, thus dominating the production and evolution of soybeans in the Mercosul countries.

Therefore, it is important to understand Monsanto's strategy in establishing its economic power in this legal context as being *a priori*, an unfavorable one. In order to register its invention, Monsanto used the pipeline system to make three requests to Instituto Nacional da Propriedade Industrial (INPI) in 1996 and 1997, just after TRIPS and the Brazilian law.⁴⁵ The three patents are explicitly gene patents of plants; the first patent is of chimerical genes.⁴⁶ The second is of a DNA sequence to intensify the efficiency of the transcription.⁴⁷ The third patent is of DNA construction to also enhance the transcription efficiency.⁴⁸ The patent requests presented genes as a protein and not as part of a living being. Therefore, it was a patentable chemical substance. This patent request clearly distorts its content and contradicts Brazilian laws that forbid the concession of patents on genes.⁴⁹

Monsanto, however, continued to demand patents for plants, seeds, and genes at the INPI, a national institution equivalent to the U.S. Patent and Trademark Office. INPI continuously denied these patents because of the regulatory prohibition. Notwithstanding, Monsanto's strategy changed. Like other companies, Monsanto filed patents in the United States, where those patents are accepted, and then asked for unionist priority in Brazil.⁵⁰ Unionist priority guarantees the validity of the patent around the world. Thus, even if the patent is not granted where it was originally ordered, it does not restrain other countries from accepting the patent. The first solicitant's priority guarantees the patent's right during a reasonable amount of time, protecting the patent from competitors. This way, even if the country of origin does not grant the plant patent, competitors are prohibited from having patents on the same object in other locations for the time necessary for other patent offices to analyze it. In developing countries, this period could take even longer.⁵¹

Companies could use the institutional weaknesses of developing countries to improve their rights, even when no rights existed. In Brazil, the INPI needs an important period to analyze a biotech patent.

45. CYNTHIA M. HO, ACCESS TO MEDICINE IN THE GLOBAL ECONOMY: INTERNATIONAL AGREEMENTS ON PATENTS AND RELATED RIGHTS 225 (2011).

46. Braz. Patent Order PI1100007-4, 06/08/1998.

47. Braz. Patent Order PI1101067-3, 14/05/1997.

48. Braz. Patent Order PI1101045-2, 14/05/1997.

49. Maria Thereza Wolff, *Patenting Research*, J. DO COMÉRCIO (July 10, 2003), available at <http://www.dannemann.com.br/site.cfm?app=show&dsp=mtw6&pos=5.7&lng=pt> (last visited Apr. 10, 2013).

50. As seen in the invention orders PI1101069-0, PI1101070-3, and PI1101050-9.

51. See generally Robert Sherwood et al., *Promotion of Inventiveness in Developing Countries Through a More Advanced Patent Administration*, 39 IDEA: J.L. TECH. 473 (1999).

Sometimes, this process takes many years during which time the patent must be respected. Monsanto could enforce its rights that were granted in the United States in Brazil. Monsanto could also improve its legal rights through a series of agreements with farmers. Farmers only signed those agreements because they believed there was a patent right that obligated them to do so. When these patents were finally denied by INPI, Monsanto initiated lawsuits, either contesting the INPI decision or asking for patent extensions. Because the courts took five to ten years to decide, the seed company enforced its rights for a period longer than usual for a patent.

However, contradicting the evidence, the firm argued in the instruction of the order of invention that the genes from the first patent were not genes, but part of a non-natural biological process. Such a determination would make the genes susceptible to a patent according to the Brazilian Law 9.279/1996. The reasoning, inspired by the North American doctrine, contradicted the Brazilian legislation.

The first invention request from 1996 was granted on August 6, 1998. INPI's decision clearly contradicted Brazilian legislation on patents because it accepted the gene patents by recognizing the insufficient rhetorical argumentation of Monsanto distinctly contrary to the law. Nevertheless, a week later, competing companies Zeneca and Nortox appealed through an administrative action, claiming INPI's decision was not grounded. The administrative proceeding was put on hold; in the meantime other companies filed a lawsuit battle in the judiciary⁵² that has dragged out for more than 10 years as a result of Monsanto's patent being nullified. During the lawsuit, Monsanto kept its intellectual property rights. In other words, Monsanto was able to keep for more than 10 years (almost half the length of a patent) commercial exclusivity on a plant that should not be granted a patent in Brazil. The lack of efficiency of INPI and of Brazil's Judiciary engenders, therefore, important economic consequences for the costs of agricultural production.

Some farmers' associations filed lawsuits against Monsanto. However, Monsanto presented different patents and the provisional measures of INPI that supported them. Normally, judges would accept those patents as valid and enforce Monsanto's rights, primarily because either most of these farmers' associations did not present the real scope of these patents, or the judges did not possess the expertise required to understand the patents' legality and validity.

Thus, Monsanto was able to create patent rights in a legal scenario that forbade them and assured the patent rights through different lawsuits with legal injunctions that took more than a decade to be

52. J.F.R.J.-6, *Nortox & Zeneca v. Monsanto*, Case 990063442-0 (Braz.).

finally judged.

VI. THE AGREEMENTS WITH INTERNATIONAL TRADERS BASED ON INTELLECTUAL PROPERTY RIGHTS

If TRIPS offers the countries of the WTO the freedom in patentability for some inventions in the field of the living, then this freedom is limited to the territory of these countries. From the moment the producers decide to export to countries where the patentability of these inventions is recognized, it is this second option that will prevail. Thus, Monsanto extended patents using its commercial power and control on strategic markets.

The WTO guarantees to countries the sovereign freedom to grant a varying level of rights to the holders of intellectual property rights. However, embracing patents granted in Europe and in the United States on plants, companies can control importation in territories where these patents are recognized. In other words, the choice made by countries, such as Brazil, to restrict several biotechnological inventions from protection through patents, as allowed by the TRIPS agreement, is valid in Brazilian territory. However, when Brazil decides to export soybeans to another country, the importing company can block imports based on its rights guaranteed by the importer.⁵³ Because most of Brazil's soybeans are exported, the legal norms for importers in Brazil have significant extraterritorial effects.

In fact, the TRIPS agreement allows countries to give patent holders the right to prohibit a patented product from entering their territory.⁵⁴ Thus, different countries can vary in the principle of rights exhaustion. The rights of a patent holder are exhausted after the commercialization in a country where royalties were paid. The product can circulate freely in that country. If the importing country accepts the principle of rights exhaustion, intellectual property rights holders in that country will not be able to forbid imports. Many countries follow this principle. In fact, Europe accepted rights exhaustion in its Unionist space.⁵⁵

The rights exhaustion of plant patenting is different because grain exporters (cooperatives or firms) are not obligated to pay intellectual property rights derivative of patents for the use of genetic material

53. Jay Erstling & Isabelle Boutillon, *The Patent Cooperation Treaty: At the Center of the International Patent System*, 32 WM. MITCHELL L. REV. 1583, 1588 (2006).

54. TRIPS, *supra* note 1. This happens if there is no agreement from the rights holder and if the country of origin gives the same intellectual property rights as the country of destination.

55. WAGENINGEN UNIV. & RES. CENTRE, Centre for Genetic Res., The Neth., *Breeding Business: The Future of Plant Breeding in the Light of Developments in Patent Rights and Plant Breeder's Rights Report* 34, GN Rep. 2009-14 (Niels Louwaars et al. eds., 2009).

patented in Europe. Nevertheless, the rights holder will have to act if the product is imported into a country that recognizes plant patents or gene patents. In this case, the patent holder's rights were not exhausted because the product (*i.e.*, soybean) was set in the Brazilian market without patent protection and without the authorization and consent of the patent holder. The holder will act, therefore, in the locale of the importation.⁵⁶ Many of these decisions were the object of discussion at the European level.⁵⁷

Because Brazil exports such a large quantity of soybeans to Europe, it became necessary to make agreements between the exporters, the importers, and Monsanto. The agreements tried to compensate for losses of intellectual property rights. In other words, a country may not foresee the patentability of a product as long as it does not export to a country that does foresee it. Considering the destination of most parts of soy production, we can conclude that Brazil's freedom to legally choose to constrict the patent rights on agricultural products is extremely limited.⁵⁸

Thus, Monsanto could enforce its patents rights in Brazil using the judiciary system and TRIPS's possibilities regarding the extension of rights for global markets. In the first case, it was possible to create a higher level of intellectual property rights protection at the institutional level. In the second case, it was possible to control exports, normally through other multinational companies (traders) acting in Brazil.

VII. AGREEMENTS WITH COMPETENT SEED COMPANIES

Monsanto and Brazilian seed companies can sign a commercial contract that uses the gene of resistance in the varieties they offer on the market. As set by the contract, the licensed company can use the Monsanto gene and incorporate it into their varieties. In exchange, they establish an agreement with farmers who buy seeds with the protected gene stating that they would pay Monsanto a fee, referred to as the "rate of use of technology." In turn, Monsanto would gather these fees and

56. *Monsanto Tech. LLC v. Sesostris S.A.E.*, Case 488/07, *The Case on Soybeans and Monsanto*, Decision of July 27, 2007 [hereinafter *Case on Soybeans*]; *Monsanto Tech. LLC v. Cargill Int'l SA* [2007] EWHC 2257 (Pat); Case C-428/08, *Monsanto Tech. LLC v. Cefetra BV*, 2010 E.C.R. I-6790; U.K. High Ct., *Monsanto Tech. LLC v. Cargill Int'l*, Decision of Oct. 10, 2007.

57. Marcelo Dias Varella & Maria Marinho Pinto Edelvacy, *Intellectual Property and Export of Soybean: Reflections from Experience of Argentina and Brazil to Face Judged by the European Courts*, in *INTELLECTUAL PROPERTY IN AGRICULTURE* 223 (Charlene De Avila Plaza et al. eds., 2011).

58. Bernard Remiche & Vincent Cassiers, *Anti-Counterfeiting and North-South Transfer Technologies: A Real Challenge*, 23 *INT'L J. ECON. L.* 277-324 (2009).

pass on 12.5% of the total gathered to the licensed firm. These agreements could be made because other companies believed these companies should pay for the gene patents, even if these patents were the objects of a legal dispute.

At last, the agreement ensures that the licensed seed firms do not have the right to insert other genes with rights belonging to competing firms in a variety with the Monsanto gene, even if these other genes would provide different characteristics. The standard agreement determines that licensed firms cannot establish contracts with other firms while simultaneously using the protected Monsanto gene.⁵⁹ Therefore, there cannot be two or more distinct technologies in the same plant. The firm must choose between the Monsanto gene and the other gene. Seeing the commercial success of the gene resistant to glyphosate, competitors have not shown an interest in adding other genes. Consequently, Monsanto's monopoly is strengthened with the commercialization of a great part of the country's soybeans.

Contracts like this one were established with the firms FMT, Unisoja, Coodetec, and Embrapa (Public Firm of Agricultural Research). These deals enabled Monsanto to control 82.7% of the national soybean production. Even though only a part of this soybean contains the glyphosate resistant gene, it is thought that, in a short period, almost all cultivated plants will contain the technology, thus ensuring Monsanto's significant control over the entire seed production.⁶⁰

Seed companies will likely not react negatively to this situation because they cooperate with Monsanto. The seed companies can freely sell their traditional seeds and can sell their own variety that contains the gene Monsanto licensed to them that competes directly with their traditional variety. However, because they receive a 12.5% rate on technology, seed companies are induced to sell the genetically modified seeds rather than their traditional seeds, because their profits are higher. Besides the seed market, Monsanto gathered a third generation of profits because the firm is also the biggest producer of glyphosate in Argentina and Brazil. This herbicide considerably increased Monsanto's market share compared to the number of farmers who use the resistant soybean to this same herbicide. With the increased use of this soybean variety, the use of herbicide also increased proportionally.⁶¹

59. Challenge the Process, *supra* note 6. This information was given to SEAE by the firm. Fok & Varella, *supra* note 5, at 5.

60. Monsanto marketshare was only 18.70% in 2002. Competing companies: Embrapa (27.98%), MGF (19.65%), Coodetec (16.37), Fepagro (2.27%), CTPA (1.64%), Bayer (1.37%). Fok & Varella, *supra* note 5, at 11 tbl.1.

61. Brazil became one of the highest markets for agrochemicals, 773.9 tons in 2008 (in the United States, it was 646 tons in the same year). See Interview by Patricia Fachin with Maria

In March 2006, the Economic Defense Secretary ordered the Competition Defense Council to analyze this subject.⁶² In a temporary decision, the Council decided that Monsanto and its partners had to change the exclusivity sections of their contracts to allow the addition of other genes, therefore avoiding a soybean technological monopoly.

Consequently, Monsanto improved its market share on soybean seeds substantially in a few years. However, its most difficult step was to make every farmer respect Monsanto's patent rights and pay for the soybeans. The main problem was that most of the soy planted in Brazil was not bought from Monsanto. Instead, it was planted by the farmers themselves, by cooperatives, or illegally brought from Argentina without Monsanto control.

VIII. THE EXTENSION OF INTELLECTUAL PROPERTY RIGHTS THROUGH AGREEMENTS DIRECTLY WITH FARMERS

Monsanto needed to control farmers. However, it was difficult to do so. Because farmers did not buy their seeds from Monsanto, it was impossible for Monsanto to discover who was using its technology or not. Monsanto's first step was to start a control on the new seeds. Every time a farmer bought new seeds from Monsanto or from one of its associate companies, the farmer was obliged to sign an agreement on the seed sale, which required the farmer to pay royalties to Monsanto.⁶³ Moreover, Monsanto could build an important database with names, addresses, sizes of properties, and quantities of seeds bought by each farmer.

The second step was to control all of the other farmers who produced their own seeds. To do so, Monsanto created an *ex post* control. When those other farmers tried to sell their seeds to a trader, the trader had an agreement with Monsanto to test them and verify if the seeds were GM seeds. In that case, the trader could only buy the seeds after a compensation payment to Monsanto. In both cases, the payments were based on the presumption that there were valid patents on the seed.⁶⁴

Jose Guazzelli, Agronomist, Brazil, The Largest Consumer of Pesticides (June 8, 2009), <http://www.ecodebate.com.br/2009/06/09/brasil-o-maior-consumidor-de-agrotoxicos-entrevista-especial-com-maria-jose-guazzelli/>.

62. Challenge the Process, *supra* note 6; Fok & Varela, *supra* note 5.

63. "A cordo para Licenciamento de Tecnologia Roundup Ready" [Technology Licensing Agreement for Roundup Ready], <http://www.apsemg.com.br/imagens/File/Acordo%20Geral%202009%20FINAL%20MIR%2024.07.09.pdf>. See also Andressa De Sousa E. Silva, System of Governance of Soybean Genetically Modified and Principles Guiding Biosafety (2008) (LLM dissertation, Centro Universitario de Brasilia) (on file with Centro Universitario de Brasilia), available at <http://www.uniceub.br/pdf/DissertacaoAndressa.pdf>.

64. Varela & Edelvacy, *supra* note 57, at 227.

Monsanto justified its right to ask for compensation as a consequence of its patents.

For example, in Brazilian states such as Parana where control was strict, the area planted with this soybean variety was rather small. At the end of the harvest, when the illegal plantings were found, the Federal Government exempted the farmers, instead of applying the punishments proscribed by the law.⁶⁵ Consequently, production increased in the following years, and again each year farmers were amnestied. This continued until the plantings of 2004-05, which reached 300 million acres of glyphosate-resistant soybeans, when growing it was legally authorized. In 2009, according to Monsanto and the agricultural cooperatives of the State of Rio Grande do Sul, an estimated 90% of soybean plantings in Rio Grande do Sul were genetically modified.⁶⁶ After a few years, when it was not possible to avoid this variety of soy, the government finally authorized it.⁶⁷

At an inferior level, Monsanto also made deals with farmers' cooperatives, consenting to a discount for those who control and cooperate with the payment of royalties on its technology. According to Monsanto,⁶⁸ it signed more than 300 contracts with cooperatives of all sizes. In these deals, there are "discounts on the sale price" of up to 5% of the normal price charged.⁶⁹ Additionally, Monsanto expanded its

65. Lei No. 10.711, de 5 de Agosto de 2003, Standards for the Planting and Marketing of Soybeans Harvested, Sept. 2003 (Braz.).

66. Christopher Heath, *The Scope of DNA Patents in the Light of the Recent Monsanto Decisions*, 40 INT'L REV. OF INTELL. PROP. & COMPETITION L. 940, 943 (2009).

67. Lei No. 11.105, de 24 de Marco de 2005, Biosafety Law, Marc. 2005 (Braz.).

68. Challenge the Process, *supra* note 6.

69. The cooperatives help in the inspection, demanding the gathering of values to the firm on each bag sold. See Bianchini Cooperative S/A: Standard Agreement Between Monsanto and Suppliers, Legal Entities, and Brokers (2010) (on file with author).

To all Our Suppliers, legal entities and relevant brokers (. . .) Considering that we established a contract with the firm Monsanto, with in mind the commercial licensing on soybean "Round Up Ready" and the correspondent payment of the intellectual property rights (IPR), from which originates high tickets, we require the attention and kindness, from now on and in case the merchandise contains genetically modified organisms, when confirming soybean sells to do it taking into account the following statements:

I) In the case of Participants:

"The salesperson declares that he enters the system of intellectual property rights (IPR) of soybean Round Up Ready of Monsanto, in the category of Participant."

II) In the case of Collaborators:

"C The salesperson declares that he enters the system of intellectual property rights (IPR) of soybean Round Up Ready of Monsanto, in the category of collaborators. Consequently, by doing so, he authorizes the buyer to deduct

database with data from cooperative members.

In this scheme, firms benefit by receiving rates from the use of the technology. Companies like Monsanto are free to fix rates as they wish, and these rates have increased substantially over the past few years. The initial value charged for the use of technology was fixed at R\$1.20 per bag of 60 kilos (2.20 bushels); but Monsanto, since the beginning, gave a 50% “discount” to farmers. Back then, with the sack value on the international market at R\$45, this represented 1.3% of the seed price. Nevertheless, with soybean’s devaluation of the Brazilian Real in relation to the American Dollar, there was a substantial increase of the percentage charged. The discount died out. In 2005, for example, Monsanto charged a value of R\$1.20 per each sack of R\$30.00, which was about 3.75% of the seed price. This represented a charged amount of approximately 80 million dollars only on the soybean production of Rio Grande do Sul, where Monsanto especially concentrated its efforts to gather charges for that year.⁷⁰

IX. THE LEGAL BATTLE AMONG EUROPEAN IMPORTERS, FARMERS, AND MONSANTO: THE FALL LIKE A HOUSE OF CARDS

Because there are no instruments to verify the existence of the modified gene on a grand scale, the collection of charges was done on the entire cultivated crop without undergoing detection tests. Once seeders and other cooperatives integrated Monsanto’s “intellectual property system,” farmers ended up with no means to question the system, with rare exceptions. One of these exceptions was the class action suit brought by Cotricampo Cooperative, from Campo Novo, Rio Grande do Sul, against Monsanto.⁷¹ In the files, the cooperative argued the illegality of royalty collection, the lack of existence of intellectual property rights on the cultivated plant, the impossibility to charge the produced grains according to the law in force, cartel formation with the remaining firms, and the oligopoly represented by the considerable market domination of Monsanto, Cargill, Bunge, and ADM. The cooperative obtained a restraining order preventing the royalty

from the price that will be given by the payment of the merchandise R\$0.60 by bag of 60kg, to be passed again to Monsanto of Brazil, related to the payment of the IPR.”

Id. Challenge the Process, *supra* note 6. Cotricampo Cooperative gathers 8,721 farmers in 12 municipalities in Rio Grande do Sul summing a production in 2003 of 1,700,000 bags of soybean.

70. Interview with the lawyers of Agricultural Cooperatives, in Campo Novo, Rio Grande do Sul (Oct. 7, 2009).

71. Challenge the Process, *supra* note 6.

collection, which was canceled by the Supreme Court of Justice.

Monsanto retaliated against the farmers who brought this matter to justice by using incriminating statements made to Rio Grande do Sul's Prosecutor, alleging an infraction of its intellectual property rights.⁷² The prosecution even proposed a claim for a denunciation, which was carried out by the judiciary. In an interesting sentence, the Company and the *parquet's* allegation were not accepted by the magistrate, which based its interpretation on the piled up theory in order to acquit the farmers reasoning that it would not be possible to classify something that the State stimulates as an infraction.⁷³ In the absence of a judiciary decision on the legality of the patents granted to Monsanto, the case remained open. The state failed to exhibit its control and essentially permitted the smuggling of genetically modified soybeans. The amnesty given by the temporary measures of the Federal Government also encouraged the crop. Consequently, one cannot talk of infraction, which confirmed the trial of the Courthouse of the State of Rio Grande do Sul.⁷⁴

This legal strategy, it would appear, started to collapse after the European Courts' decisions, starting with Monsanto itself. Monsanto started lawsuits against importers of soybeans from Argentina, based on the European Regulation 1383/2003, in order to enforce its rights on Argentinean traders. Monsanto requested the retention of the product in European ports if they were not paid royalties on patented genes. Importers of Argentine soy did not accept the proposal from Monsanto. Monsanto then requested the retention of the goods at the customs ports of Spain, the United Kingdom, and the Netherlands. However, after a few years, these courts ruled in a restrictive interpretation against Monsanto. Altogether, there were three different decisions with different repercussions. In Spain, the Trade Court of Madrid ruled that the European Regulation did not allow the extension of rights to processed soybeans.⁷⁵ In the United Kingdom, the Court not only accepted the same argument as that in Spain, but also accepted the argument of an importer, Cargill, that Monsanto stimulated the contrafactual and thus could not invoke the violation of its patent rights.⁷⁶ In the Netherlands, the Court, facing a relevant doubt, sent the case to the European Court of Justice. After a few years, on July 6, 2010, the European Court of Justice decided to uphold the restriction of rights on Monsanto's rights, holding the imposters of products derived

72. *Id.*

73. *Id.*

74. *Id.*

75. Case on Soybeans, Case 488/07, The Case on Soybeans and Monsanto, Decision of July 27, 2007.

76. *Monsanto Tech. LLC v. Cargill Int'l SA* [2007] EWHC (Pat.) 2257 (Eng.).

from biotechnological inventions (such as soybeans) should not pay royalties.⁷⁷ This decision became valid to the entire European territory.

Because exporters at the international level did not have to pay any further royalties, the “house of cards” started to collapse. The leading case was a class action suit filed on April 14, 2009. It is still under judgment at the Court of Appeals of Rio Grande do Sul, but the preliminary decisions are nevertheless noteworthy. The plaintiffs are rural syndicates of Passo Fundo, Sertão, and Santiago. Passo Fundo is the only city of average size, and Sertão and Santiago are villages with few inhabitants. Yet these are traditional centers of soybean production. During the lawsuit, more than 370 other syndicates or associations joined the action.

The farmers asked for the following: a) to stop paying royalties to Monsanto because they did not purchase any grains from it; b) suspension of the payments during the trial because the payments could be then used against them as a form of self-recognition of the rights of Monsanto; c) judgment that the rights values were abusive and in violation of the principle of the social function of property; d) judgment that the Brazilian law prevents dual protection by both patents and the UPOV system, and that the only system to obey was UPOV; e) judgment that the patents were invalid.

Monsanto had the following arguments: a) it had several valid patents on soybeans, according to the Brazilian Patent n.9.279/96 (following TRIPS); b) it had UPOV rights recognized by the Brazilian Law 9.279/96. The INPI participated on the side of Monsanto and argued that the patents were valid.

The judge first asked Monsanto to present the patents and all other intellectual property rights that justified its claim. Monsanto proceeded to present three patents. Then, the judge hired an expert to evaluate those patents, UPOV rights, and all other information registered by Monsanto in other countries that could be valid through the Unionist system, such as the recognition of a U.S. pipeline patent.

The judge’s conclusions at the trial were quite interesting:

a) With respect to the first patent (PI 11001067-3), it was a patent assured by pipeline. The deposit date was the first one in the United States. Thus, the validity expired on January 23, 2007. Monsanto attempted to receive an extension with more litigation at different courts, but after several attempts this was ultimately denied by the Federal Justice.

b) The second patent (PI 11001045-2) also lost its validity on January 13, 2007. Like the first one, it was the subject of several court

77. C-428/08, *Monsanto Tech. LLC v. Cefetra BV*, 2010 E.C.R. I-6790.

cases, and it had similarly lost its validity in a final decision after many years of litigation.

c) The third patent (PI 110008-3) lost its validity on August 31, 2010. This patent was subject to another trial extension, considered impossible at first by the Federal Justice Federal of Rio de Janeiro on April 4, 2011. Monsanto has appealed, and the judgment has not yet been made by the Federal Justice (as of fall 2012). According to the expert, among the patents submitted by Monsanto, the third patent would be the only one to have a relationship with the patented soybeans.

The judge ruled that Monsanto had no rights because:

1) There is no suspensive effect in the appellation. Therefore, the only possible patent was no longer valid.

2) The Brazilian law prevents dual protection, so the patent has no effect on living matter (soybean seed).

The judge, therefore, held that Monsanto shall:

a) Return all that it acquired from farmers since the harvest of 2003 through 2004, plus 1% per month in interest, plus inflation.

b) Pay a daily penalty of 1 million Brazilian Reals (about \$500,000) for the suspension of the requirement of rights.

Finally, the judge acknowledged the existence of the farmers' right to produce their own seeds regardless of the size of the farm.

As of fall 2012, the Court of Appeals of Rio Grande do Sul has not judged the decision. However, the parties estimate the compensation would be approximately \$2-3 billion if confirmed. This would be the last instance for this kind of process.

Indeed, the Brazilian law is very clear about the exclusive applicability of the law instead of UPOV on seeds and the impossibility of accumulation. Yet, the combination of the judiciary taking an enormous amount of time to judge and its lack of knowledge on biotech patent rights is an institutional weakness in Brazil that makes it even more difficult to coordinate solutions.

Monsanto takes advantage of these institutional weaknesses by getting pipeline patents. Monsanto also uses extensions at different judicial fora in the federation and extensions of several patents to secure these rights, although some patents had nothing to do with soy. Sometimes, Monsanto demonstrated its rights with patents unrelated to soybeans. For example, the judge made an explicit (and ironic) report about a Brazilian jurist's opinion and added it to the process at Monsanto's request and analyzed a patent that was not even under

discussion. Given that this was a class action case, the judge had the opportunity to require Monsanto to compensate all farmers in the country, even those who were not part of the process.⁷⁸

X. CONCLUSIONS

The complexity of the patent legal system for biotechnology allows companies to patent genes, even when countries expressly prohibit these patents through their legislation. This is especially true in developing countries where the patent offices are more fragile. In these types of countries, even when a patent office denies patent demands, companies can enforce patent rights by utilizing the judiciary. Because the time to decide these lawsuits could take many years, in practice the judiciary allows patent holders to exercise their monopoly for periods as long as permitted under a regular patent.

The complexity of patent law also makes it difficult for other actors involved in the production chain, regardless of whether or not there are intellectual property rights over a plant and the limits of these patents. The case study shows that Monsanto used patents not related to GM soy nor valid in Brazil to convince Brazilian farmers and courts that it had rights to control soy production.

Monsanto substantially increased its control on the Brazilian production of soybeans through a series of agreements established directly with farmers, as well as with trade barns and traders.⁷⁹ Schematically, the increased control happened in two aspects: the control of the production and sale of seeds by the acquisition of local seed companies, and the control of intellectual property rights on transgenic seeds produced by farmers.⁸⁰ This control happened easily due to the farmers' interests in this soybean, resistance to glyphosate, and, in the Brazilian case, the farmers' beliefs that there were valid patents that obligated them.

The soy planted in Brazil was not bought from Monsanto. This genetically modified soybean was the result of the crossing done by farmers between traditional Brazilian soybeans and Monsanto soybeans imported illegally from Argentina.⁸¹ Since Brazil had temporarily banned genetically modified crops at this time, Monsanto could not sell its "soy resistant to glyphosate" in Brazil. However, even though their sale was illegal, these beans were rapidly adopted at the main

78. *Id.*

79. In conducting this research, our team interviewed farmers in three different states (Goiás, Mato Grosso, and Paraná) to collect information about agreements.

80. See *Challenge the Process*, *supra* note 6.

81. *Id.*

production centers without any real control from public authorities. Brazilian farmers imported the soybean, reproduced the seed in Brazil, and started the cultivation in great scale, despite the prohibition. Considering the amount of seeds used, it is believed that some of the authorities who were in favor of the genetically modified soybean willingly did not control its insertion in the market nor control its cultivation and then, eventually, legalized it.

Monsanto's interest in effectively applying its rights of intellectual property grew because Brazil had become the world's third largest producer and the RR soybean was legalized. Once cultivation was allowed, Monsanto, in collaboration with competing firms, used contracts to assume control. Monsanto offered competitors the license to use the gene of glyphosate resistance and to incorporate it into their own soybean varieties. These firms could insert the gene of resistance with the consent of the patent holder of the gene and could start to sell genetically modified soybeans with Monsanto's technology. Because it is a technology of high interest for the farmers, companies that cooperated gained a share of the market, and, above all, would be able to export legally.

However, the strategy was fragile because after many years, even in a developing country like Brazil, the judiciary analytically discerned the technically complex patent applications and noted their invalidity. The result was a court decision with significant compensation damages against Monsanto. This decision is one of the highest compensations involving intellectual property rights in history.