

## NOTES

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### INTRODUCTION

1. English translations of Brazilian proper nouns are followed by their Portuguese acronyms. See Acronyms and Abbreviations for the full Portuguese names.
2. Each social movement has its own banner, anthem, and insignia: small farmers, for example, use a straw hat, landless peasants a red cap, and peasant women a mauve scarf.
3. In 2000, AstraZeneca and Novartis merged their agrichemical businesses to form Syngenta AG, which was acquired by China National Chemical Corporation (ChemChina) in 2015.
4. I use the term *seed* broadly to include every plant structure (for example, seeds, seedlings, cuttings) used in the propagation of a plant.
5. Critically examining the proprietary dimension of biotech crops is all the more important, given the industry's "pro-poor technology" narrative. See Stone (2002) and Glover (2010a, 2010b).
6. "Proprietary seeds" are branded seed varieties subject to intellectual property protection.
7. These four corporations continue to consolidate their hold on the market even further by entering into agreements over the cross-licensing of IP, research, and development. See IPES-Food (2017).
8. A plant variety meets the DUS criteria for plant variety protection if it differs from existing varieties ("Distinct"), if its characteristics are expressed uniformly ("Uniform"), and if those characteristics do not change over subsequent generations ("Stable"). "New" in this context means that it is new on the market.
9. For a more detailed explanation of the differences between traditional and molecular plant breeding, see Krinsky (2019), chapters 1–3.

10. In an 1889 decision rejecting a patent application on a pine fiber, the US Patent Office wrote: “If [such a patent] were allowed, patents might be obtained upon the trees of the forest and the plants of the earth, which of course would be unreasonable and impossible” (cited in Beauchamp 2011, 13).

11. For a more detailed discussion of these cases, see Aoki (2008), Pollack (2004), and Peavey (2014).

12. The Supreme Court of Canada judgment in *Monsanto v. Schmeiser*—a 2004 decision narrowly grounded in patent law—failed to consider other important questions related to biosafety, environmental liability, and farmers’ rights. Indeed, the judgment was widely criticized as relieving companies of any responsibility or liability for genetic contamination (Cullet 2005a). The Supreme Court determined that it was up to Parliament to consider these issues and to amend the Patent Act accordingly.

13. Out of 147 patent violation suits it has filed against US farmers since 1997, Monsanto won all 9 cases that went to trial (Schapiro 2018). In the remaining cases, Monsanto reached confidential, out-of-court settlements.

14. In addition to intellectual property, other mechanisms contribute, directly or indirectly, to the enclosure of seeds, notably seed laws (which regulate seed production, marketing, and trade) and phytosanitary regulations (which set plant health standards and food safety rules). See Wattnem (2016).

15. The corporate food regime was preceded by a colonial-diasporic food regime (1870–1930s) and a mercantile-industrial food regime (1950s–1970s).

16. *Evergreening practices* are various legal, business, and technological strategies used by industry to extend the duration of patents that are set to expire and thereby to prevent inventions from entering into the public domain. *Patent thicket* refers to the dense web of overlapping IP rights that can cover an invention, thus requiring competitors to enter into multiple licensing deals.

17. Rosemary Coombe stands out for addressing intellectual property and human rights in a 1998 article. See Coombe (1998).

18. See Canfield (2020) on ethnographic approaches to property; and Coombe and Chapman (2020) on intellectual property more specifically.

19. Thanks to an anonymous reviewer for this wording.

20. On Argentina, see Lapegna and Perelmutter (2020); on Colombia, see Escobar and Fitting (2016); on Pakistan, see Rana (2021).

21. The Global South is understood here as a geopolitical concept and as a political subjectivity, which encompasses people as well as spaces that are in a subaltern position in relation to global capitalism (Mahler 2018).

22. In 2019, the top producers were the United States (72 million hectares, or Mha), Brazil (53 Mha), Argentina (24 Mha), Canada (13 Mha), and India (12 Mha) (ISAAA 2019).

23. One hectare is equivalent to 2.47 acre, or 10,000 square meters. The International Service for the Acquisition of Agri-Biotech Applications (ISAAA) is an industry

group actively promoting GM crops worldwide. Its annual statistics on GM crop production are widely cited, as the organization is the only available source of statistics on GM crops globally. Its data, however, must be used with caution. ISAAA provides statistics for countries for which there are no official statistics; it does not disclose the source of its information; and its statistics have sometimes been found to be inflated. See FOEI (2006).

24. The family farming sector produces an estimated 70 percent of the food consumed domestically (MDA 2008, 5).

25. According to the country's 2015–2016 census of agriculture, there are close to 126 million small and marginal farmers in India, who each own less than two hectares of land. They account for 86 percent of all farmers but own just 47 percent of the total crop area (GoI 2020).

26. Public agricultural research in Brazil is conducted under the authority of the Brazilian Agricultural Research Corporation (EMBRAPA), and in India it falls under the Indian Council of Agricultural Research (ICAR).

27. In India, the National Gene Bank holds over 395,000 samples, representing 1,584 species (NBPGR n.d.). In Brazil, EMBRAPA Genetic Resources and Biotechnology—part of the Brazilian Agricultural Research Corporation—holds 140,000 seed samples, representing 960 species (EMBRAPA n.d.).

28. Both countries are parties to the CBD. India ratified the Plant Treaty in 2003, and Brazil did so in 2008. The Plant Treaty came into force internationally in 2004. India ratified the Nagoya Protocol in 2012, and Brazil in 2021.

29. According to GRAIN and LVC (2015, 28), “As early as 2003, Monsanto had a department of 75 employees with a budget of 10 million USD dedicated to the sole purpose of pursuing farmers for patent infringement.”

30. In 2015, the Big 6 were BASF, Bayer, Dow Chemical, DuPont, Monsanto, and Syngenta. By 2018, these companies had merged to become a trinity of DowDuPont, Bayer-Monsanto, and ChemChina-Syngenta.

## CHAPTER 1

1. The role of transnational corporations in formulating the WTO Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) has been amply documented (Matthews 2002; Sell 2003, 2009). As a pharmaceutical industry representative candidly said at the time, “industry . . . crafted a solution, reduced it to a concrete proposal and sold it to our own and other governments” (Oh 2000).

2. The TRIPS Agreement was unprecedented in that it established a link between two issues—trade liberalization and intellectual property—previously seen as having no logical connection (Purdue 2000).

3. Canada, for example, enacted its first plant breeders' rights legislation in 1990, and Norway in 1993.

4. This section is based on a comparative reading of accounts by two of the main negotiators for Brazil and India, Tarragô (2015) and Ganesan (2015), respectively.

While the pharmaceutical industry loomed large in the negotiation of the TRIPS Agreement, I focus in this section on the discussions related to plant biotechnology.

5. The Special 301 Report of the Omnibus Trade and Competitiveness Act 1988 is published annually by the Office of the US Trade Representative as a unilateral measure to put pressure on countries to increase IP protection beyond what is required by the TRIPS Agreement.

6. A cosmid is a type of hybrid plasmid (DNA molecule) that allows cloning of large DNA fragments.

7. This strategy was well captured in the title of a 1996 article by GRAIN: “UPOV: getting a free TRIPs ride?” (GRAIN 1996). On TRIPS-compatible alternatives to UPOV, see Helfer (2004) and Correa et al. (2015).

8. The Brazilian Industrial Property Code of 1945 provided for the possibility of protecting IP in plant varieties, but it depended on the enactment of special regulations, which never occurred.

9. At the time, Brazil was in the throes of a dictatorship (1964–1985). Without downplaying the role played by mobilization in defeating the bill, the military government’s national-developmental ideology and the fact that it saw food security as a strategic issue also played a role in the bill’s demise (Pelaez and Schmidt 2000).

10. Founded in the aftermath of the military regime (1987), IDEC is Brazil’s oldest and largest consumer protection organization. The Brazilian chapter of Greenpeace International was created in 1993.

11. The PVP Act defines a small rural producer as someone who exploits a parcel of land using mainly family labor as opposed to hired labor, and who resides on their property or at least nearby. To avoid the inclusion of unproductive large estates (*latifúndios*), properties in this category may not exceed size limits set forth in the Act (RFB 1997, Art. 10.3).

12. Since 1999, countries that choose to join UPOV no longer have the option to do so under the 1978 Act—they must obligatorily join under the 1991 Act.

13. President Collor de Mello was impeached later that year, following corruption charges.

14. Fernando Henrique Cardoso was president from 1995 to 2002.

15. Farmers are defined in the PPVFR Act as persons who cultivate crops themselves or through direct supervision or who conserve and add value to wild species or traditional varieties through selection and identification of their useful properties (GoI 2001, Art. 2k).

16. Ethiopia, the Philippines, and to lesser extent Malaysia have similar provisions.

17. In the first 10 years, the PPVFR Authority issued 3,538 certificates of registration for plant varieties. Of those, 44 percent were for farmers’ varieties. Data compiled from PPVFR Authority (2019).

18. Section 3 of India's Patents Act excluded from patentability "any process for the . . . treatment of animals or plants to render them free of disease or to increase their economic value or that of their products" (GoI 1970).

19. The case of India is instructive: if it were not for pressure from civil society actors, India would likely have joined UPOV and agreed to plant variety protection norms based on UPOV 1978. This was the path taken by most countries that lacked either a strong civil society or the resources to develop their own *sui generis* legislation, and thus felt more vulnerable to external political and economic pressures. UPOV had only some 20 members in the early 1990s; by 2017, it had more than tripled its membership to 75 countries (GAIA/GRAIN 1998; UPOV n.d.).

20. This is referred to in the literature on globalization as "cunning states" (Rand-eria 2003b) or "bounded autonomy" (Newell 2006).

21. Under US law, only laws of nature, natural phenomena, and abstract ideas are considered ineligible for patent protection.

## CHAPTER 2

1. The term *event* designates the insertion of a particular transgene into a specific location on the chromosome and is used to identify genetically engineered crop varieties.

2. Unless otherwise indicated, all translations from the Portuguese are my own.

3. As one lawyer observed in a letter to the Antitrust Division of the US Department of Justice, "Probably the most well-known examples of patents covering the use of off-patent agrochemicals on GMOs are the patents governing the use of the herbicide Glyphosate" (Callahan 2009).

4. According to the precautionary principle, if an activity or technology involves potential serious and irreversible threats to human health and the environment, the absence of scientific certainty should not be used to oppose the adoption of precautionary measures.

5. For a more detailed discussion of the controversy around transgenic crops in Brazil, see Pelaez and Schmidt (2004), Scoones (2008), and Motta (2016).

6. This model of private royalty collection system was introduced around the same period in Paraguay (Filomeno 2014).

7. This is one of the key differences between the 1978 Act and the 1991 Act of the UPOV Convention. Under UPOV 91, plant breeders' rights extend to harvested material. Brazil, however, is a party to the 1978 Act.

8. Benincá appealed the decision to Brazil's Superior Court of Justice, but his appeal was dismissed on procedural grounds.

9. Monsanto does not make public how much it collects in royalties, but the sum can be inferred from available data (including sales of certified seeds, total cultivated soybean area, production per hectare, and soybean market prices).

10. Other unions and organizations expressed their interest in backing the lawsuit but were asked not to do so in order to avoid further delays in the proceedings (Interview #29A).

11. The Public Prosecutor's Office (Ministério Público) is a body of public prosecutors at the federal and state levels who are independent of Brazil's three branches of government. They are authorized by the Constitution to bring actions against private individuals, commercial enterprises, the federal state and municipal governments, in defense of minorities, the environment, consumers, and civil society.

12. According to the judge, three years was a reasonable delay, given the complexity of the case, the fact that there was no case law, and the need to analyze patents (Interview #54).

13. In the Brazilian justice system, the Superior Court of Justice (STJ) is the country's highest court for nonconstitutional matters. Litigants can only appeal a decision of the STJ before the Federal Supreme Court if they can demonstrate that the matter in dispute has constitutional relevance.

14. In a number of individual and class actions in Brazil, lower court judges have granted the judicial deposit of royalties. However, higher courts generally overturn these decisions before they become effective. This means that farmers have to continue paying royalties to Monsanto until the final ruling.

15. For example, in 2013, the Soybean Producers Association of the State of Mato Grosso (APROSOJA-MT) filed a case in a Mato Grosso court demanding that Monsanto produce its Brazilian patent on Intacta (Tubino 2013).

16. The corresponding US patent to Brazilian pipeline patent 1100008-2 is US Patent 5627061.

17. Here is a list of the fourteen pipeline patents (in bold are those patents for which Monsanto sought an extension): PI 8706530-4, PI 1100009-0, PI 9007159-0, PI 1100007-4, PI 9007550-1, PI 9508620-0, **PI 1100008-2**, **PI 1101069-0**, **PI 1101070-3**, **PI 1101047-9**, **PI 1101048-7**, PI 1101049-5, **PI 1101045-2**, and **PI 1101067-3** (Barbosa 2014, 335).

18. In one case (PI 1100007-4, "Glyphosate-resistant plant"), the Brazilian Patent Office conceded the extension but then rescinded its decision (Baumer 2005).

19. This can be done successively. For example, one of Monsanto's patent applications for the glyphosate-tolerance trait in the United States reads: "Continuation of application no. 08/833,485, filed on Apr. 7, 1997, now Pat. no. 5,804,425, which is a continuation of application no. 08/306,063, filed on Sep. 13, 1994, now Pat. no. 5,633,435, which is a continuation-in-part of no. 07/749,611, filed on Aug. 28, 1991, now abandoned, which is a continuation-in-part of application no. 07/576,537, filed on Aug. 31, 1990, now abandoned" (Official Gazette 2001, 2820).

20. This argument is supported by some legal researchers. See Ávila (2015, 121-25).

### CHAPTER 3

1. These aspects of the Bt cotton controversy in India are beyond the scope of this book. See Scoones (2006), Herring (2007), Glover (2009), Stone (2012), Kranthi (2016), and Flachs (2019).
2. In India, Monsanto coined the expression “trait fees” to refer to the estimated value conferred by the Bt gene. According to some critics, trait fees are merely “royalties under a new name” (Shiva 2016a).
3. In 1998, Monsanto acquired a 26 percent stake in Mahyco.
4. Monsanto Inc. USA has a wholly owned subsidiary in India called Monsanto Holdings Private Limited. In this chapter, I refer to both as Monsanto.
5. In addition, the sublicense agreement stipulates that the sublicensee must withdraw BG-I Bt cotton three years after the commercial approval of the BG-II varieties, or five years after the first planting of the BG-II varieties (Ramanjaneyulu 2016).
6. Amounts in Indian rupees (INR) are converted to USD using the official exchange rate (LCU per USD, period average) for the year in question.
7. For a short period between 2006 and 2009, Monsanto faced limited competition from three other Indian biotech companies—Metahelix, JK Agrigenetics, and Nath Seeds—which marketed their own first-generation (meaning single-gene) Bt varieties. This competition was short-lived, however, as these companies became Monsanto sublicensees for the two-gene BG-II technology, which, unlike BG-I, was patented in India.
8. The All India Kisan Sabha (or All India Peasant Union) was formed in 1936 as the peasant front of the Communist Party of India (CPI). The Andhra Pradesh Rythu Sangam is also affiliated with the Communist Party of India. The farmers’ organizations had the support of civil society organizations, including Gene Campaign and the Indian Social Action Forum.
9. In addition to Monsanto and MMB, the companies cited in the complaint are Mahyco, Nuziveedu, Proagro, and Rasi.
10. Contrary to India, the Chinese Academy of Agricultural Sciences had succeeded in bringing out its own Bt cotton varieties, thus offering stiff competition to Monsanto.
11. In 2007, farmers’ organizations successfully pressed the state government to further reduce the price of cotton seeds to 650 INR (16 USD) for BG-I and to 750 INR for BG-II (18 USD) (UNI 2007).
12. The seven states are Maharashtra, Gujarat, Karnataka, Tamil Nadu, Punjab, Madhya Pradesh, and West Bengal.
13. MMB challenged all three states and won against Madhya Pradesh because the state government had failed to enact a special law (Jishnu 2010a).
14. To make up for these losses, the industry changed the recommendation from one packet to two packets of seeds per acre, thus doubling its business (Ramanjaneyulu 2016).

15. Around that period, reports emerged that new forms of child labor were developing in cotton seed-producing regions. Cotton seeds are typically produced on small farms and sold to domestic and multinational companies. These cotton seed producers rely on middlemen to contract adult and child laborers to do the tedious cross-pollination work involved in the production of hybrid cotton seeds (Venkateswarlu 2010). According to one activist, a driving force behind this development was seed companies' quest to maintain their profit margins amid high and unregulated royalties and regulated maximum retail price by squeezing surplus from the labor employed in the production process (Interview #14A).

16. In India, agriculture falls under the jurisdiction of the states, but price controls are the prerogative of the Central Government, thus placing the regulation of cotton seed prices in a gray area between the two levels of government.

17. The RSS's cultural wing, the World Hindu Council (Vishva Hindu Parishad), represents an exception: it is pro-GMOs and denounces critics as "anti-science" (Chowgule 2015). On the divisions among RSS organizations on the issue of GM crops, see Jishnu (2015).

18. The sublicensing agreement stated that "The sub-licensor is empowered to terminate the sub-license agreement with immediate effect if at any time, any laws in the territory restrict the sub-license fees (trait value) specified in Article 3 payable by the sub-licensee to the sub-licensor" (CCI 2016, 16–7).

19. BG-I was initially effective against bollworms, the main pest. However, with bollworms neutralized, other secondary pests such as sap-sucking insects took over and needed to be controlled with pesticides. Moreover, it was only a question of time before the bollworm itself developed resistance. The first evidence that the pink bollworm had developed resistance to BG-I came in November 2009 (Monsanto 2010). In 2006, Monsanto introduced its second-generation cotton technology, called Bollgard-II. Within five years of its introduction, the pink bollworm had also developed resistance to BG-II (Ramanjaneyulu 2016).

20. Under Section 84 of the Patents Act, a compulsory license can be granted if a patented invention is exorbitantly priced, is not available in reasonable quantities, or is not being worked in the territory of India.

21. The ruling was not without its problems. For example, the judges accepted one argument put forward by the National Seed Association of India and instructed Monsanto to apply for protection and benefit sharing under the Protection of Plant Varieties and Farmers' Rights Act (PPVFR Act). The Court suggested that once Monsanto had registered its varieties under the Act, it could seek royalties from other seed companies that use the Bt trait. This line of argument is questionable for two reasons. First, the PPVFR Act allows the protection of a plant variety as a whole, not of specific traits. Second, the benefit-sharing provisions of the Act were intended to compensate farmers and communities whose resources have been used to develop commercial varieties (Reddy 2018b, see also Peschard 2017). To use these provisions to compensate technology providers is altogether a different matter, as well as a distortion of the Act's intent.



22. Indian Patent no. 168950, “A method of producing transformed cotton cells by tissue culture,” was granted to Agracetus by the Indian Patent Office in May 1991. The United States revoked Agracetus’s patent shortly after India did, on the grounds that the invention did not qualify as novel (Riordan 1994).

23. In the second instance, the Indian government revoked, in 2012, a patent granted by the Indian Patent Office to the company Avasthagen for a medicine to control diabetes based on traditional plants, on the grounds that these properties were already fully documented in the Traditional Knowledge Digital Library.

24. A similar situation has been reported in Pakistan, where it was widely believed in government and business circles that BG-I was patented in that country, and that Monsanto had an international patent on these technologies whereby its patents automatically extended globally (Rana 2021). However, there is no such thing as an “international patent”; a patent is either national or, at most, regional.

25. For example, in an article published in 2006, the Andhra Pradesh Agriculture Commissioner is quoted as saying that Monsanto has no patent on Bt cotton in India (Ramakrishna 2006).

26. Biosafety refers to the set of regulations aimed at preventing the potential risks posed by genetically engineering organisms.

27. This statement is similar to the ones made by Monsanto in Brazil. With regard to Roundup Ready soybean, for instance, Monsanto stated: “RR1 Technology is protected by various types of intellectual property rights, including patent and patent applications, trade and commercial secrets, and regulatory information and approvals, as well as continuing improvements, among others” (FAMATO 2013).

28. That is, 20 years after its international filing date under the Patent Cooperation Treaty.

29. The prevailing consensus is that GM crops simplify farm management but do not increase productivity. See, for example, IAASTD (2009).

#### CHAPTER 4

1. As reported by Leo Saldanha (Interview #7A).

2. The Bt gene construct also comprises the cauliflower mosaic virus (CaMV) 35S promoter, used to activate the transgene in the host genome, and two antibiotic resistance marker genes, whose function is to identify cells that have been successfully transformed (ISAAA n.d.).

3. This public interest lawsuit (no. 260/2005)—not to be confused with the biopiracy public interest lawsuit discussed in this chapter—was brought to the Supreme Court in 2005 by Aruna Rodrigues to challenge the release of genetically modified organisms (GMOs) by the government of India in the absence of a proper biosafety protocol. As of 2021, the case was still active.

4. Cornell held the patent on this method, which it licensed to DuPont. Monsanto held the patent on the other most common method to induce genetic

transformation in plants: the use of *Agrobacterium tumefaciens*, a bacterium that has the natural ability to infect plant cells. It is this second method that was used in the development of Bt brinjal. Both methods are now in the public domain, although some improvements remain under patent.

5. ABSP-II also sponsored the introduction of Bt brinjal in both Bangladesh and the Philippines. Bt brinjal has been grown commercially in Bangladesh since 2013.

6. A good deal of the controversy over genetically engineered crops in India stems from the conflict of interest due to one committee being responsible for both promoting *and* regulating biotech crops.

7. Ex situ (off-site) refers to the conservation of plant genetic resources in gene banks, as opposed to their conservation in the fields.

8. The Universities of Agricultural Sciences (UAS) are Indian public universities dedicated to agriculture. Dharwad is a city in the northwest of Karnataka. UAS Dharwad is the second oldest UAS in Karnataka, after UAS Bangalore.

9. KIA was announced on the same day as the Indo-US civil nuclear deal. According to Sridhar (2014), it was part of the concessions made by India in the negotiations to arrive at a deal—concessions that would benefit large US corporations.

10. For an early critique of ISAAA's role in Asia, see Kuyek et al. (2000).

11. ESG is a nongovernmental organization formed in 1986 and based in Bangalore, Karnataka. Its small team of ten engages in research, education, and advocacy on issues of environmental and social justice. Over the past two decades, ESG has campaigned on a range of issues, from waste management and tree-felling to the preservation of wetland ecosystems (ESG n.d.).

12. The FAO Plant Treaty was signed in 2001 and came into force in 2004. Its objectives are the conservation and sustainable use of genetic resources for food and agriculture, together with the fair and equitable sharing of the benefits arising out of their use.

13. Jayanthi Natarajan replaced Jairam Ramesh as Environment Minister in July 2011.

14. According to ESG, to put such a decision to a vote was unprecedented and revealed disagreements among the board members (Interview #7A).

15. The CAG's conclusions were supported by a 2012 report on the MoEF by the Public Accounts Committee of the lower house of parliament (Lok Sabha 2012a).

16. On March 10, 2005, Mahyco and Sathguru signed an agreement for research and development for delivery of Bt eggplant for resource constrained farmers. On March 20, 2005, Mahyco entered into a material transfer agreement with TNAU. Finally, on April 2, 2005, Mahyco signed a tripartite sublicense agreement with Sathguru and UAS Dharwad.

17. The six local varieties accessed in Karnataka through UAS Dharwad are listed in the sublicense agreement as Malpur local, Majari Gota, Kudachi local, Udupi local, 112 GO, and Pabkavi local (Mahyco, Sathguru, and UAS Dharwad 2005). The four local varieties accessed in Tamil Nadu through TNAU are MDU I, PLR-1, KKM-1, and CO2 (Mahyco and TNAU 2005).

18. In addition to claims 9–11, Mahyco canceled claim 1, related to “A method of detecting the presence of brinjal plant EE-1 elite event nucleic acid sequence in a sample.”

19. In addition to applying for a patent on the transgenic event, Mahyco also applied in December 2010 to obtain plant breeders’ rights to the Bt brinjal plant variety under the Protection of Plant Varieties and Farmers’ Rights (PPVFR) Act. Plant breeders’ rights give the breeder of a new variety exclusive rights over the propagating material of that variety for 15 years. In 2016, according to the website of the PPVFR Authority, Mahyco’s application for Bt brinjal was pending due to legal issues (PPVFR Authority 2016).

20. See Appendix C for a discussion of how the issue of access to local eggplant varieties for the development of Bt brinjal relates to the international regime governing plant genetic resources.

## CHAPTER 5

1. In 2019, PepsiCo filed an IP infringement lawsuit against Indian potato growers in what is, to my knowledge, the first-ever such lawsuit in India (this lawsuit concerned a plant breeders’ certificate, not a patent). The lawsuit was rapidly withdrawn following a spirited defense by the farmers of their rights, a public outcry, and presumably political pressure from the ruling Bharatiya Janata Party (Down to Earth 2019).

2. As for Bt brinjal, Monsanto and its partners in the ABSP-II consortium designed a two-pronged approach, in which the private sector would commercialize hybrid Bt brinjal varieties, while public agricultural universities would pursue the development of open-pollinated varieties. Because of the 2009 national moratorium on GM crops, Bt brinjal had not been commercialized as of 2021. But it is reasonable to assume that, just as with Bt cotton, restricting the Bt trait to hybrids would ensure Monsanto’s control over the commercial market for Bt brinjal.

3. Mahyco Monsanto Biotech (MMB) is Monsanto’s joint venture in India. See chapter 3.

4. Comment reported by a member of Congress during a session of the Special Commission examining a bill to amend the Plant Variety Protection Act; Brasília, December 5, 2018.

5. This quote echoes the words of the UK’s Lord Chancellor, talking about the East India Company in the late nineteenth century: “Corporations have neither souls to be damned nor bodies to be punished. They therefore do as they like.” Quoted in Dalrymple (2019).

6. Farmers, however, were represented by a lawyer from the seed company Nuziveedu, which indicates that corporate interests were involved early on (Interview #14B).

7. In negotiating technical cooperation agreements between EMBRAPA (the Brazilian Agricultural Research Corporation) and Monsanto, the former would be represented by one intellectual property adviser, while the latter would send an entire team of lawyers (Interview #77).

8. “Clash of civilization” is an expression reminiscent of Samuel P. Huntington’s influential but much-critiqued book whose title begins with these words (1996).

9. Bornstein and Sharma (2016) make a similar observation concerning the India Against Corruption movement, which has allied with Hindu spiritual leaders and used images of Bharat Mata (Mother India) associated with the Hindu right wing.

10. Patent examiners opined that a gene found in nature is *not* patentable, while one that is not found in nature and whose function or utility is specified *is* patentable.

11. *Novartis AG v. Union of India* was a landmark court case on whether the Swiss pharmaceutical company Novartis could patent the drug Gleevec in India. The Supreme Court upheld the Indian Patent Office’s rejection of the patent application on the grounds that it did not fulfill the criteria for novelty under Section 3(d) of the country’s Patents Act.

12. An ADI can be filed by any of these parties: Brazil’s president, the bureau of the Senate or of the Chamber of Deputies, the Federal District governor or the Legislative Assembly, the Office of the Attorney General, the Bar Association of Brazil, a political party represented in Congress, a union confederation or a nationwide class entity.

13. The Attorney General of the Union (Advocacia Geral da União) represents the Federal Union before the national courts and provides legal advice to the Executive Branch.

## CONCLUSION

1. A rescissory action allows a challenge to a ruling after all appeals have been exhausted but one of the parties believes the decision was seriously flawed.

2. I thank José Cordeiro de Araújo for drawing my attention to this point.

3. This interpretation was subject to judicial review before an out-of-court settlement put an end to litigation (see chapter 3).

4. Epigenetics is the study of heritable phenotype changes that do not involve alterations in the DNA sequence and pays particular attention to the influence of the environment on gene activity and expression. Genomics is concerned with the sequencing of the genome, ascribing functions to genes and understanding their structure. Postgenomics goes a step further, studying, for example, how genes are transcribed into messenger RNA and how they are expressed as proteins.

5. For an overview of the Roundup Ready patent portfolio, see Jefferson et al. (2016).

6. While proponents contend that gene editing is more precise than recombinant DNA techniques, critics argue that the GE process can nevertheless have on-target effects (unintended effects at the target site) and off-target effects (unintended effects in other parts of the genome).

7. I thank Maywa Montenegro for drawing my attention to this point.

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# Seed Activism

## Patent Politics and Litigation in the Global South

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