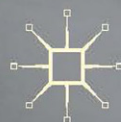


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Felipe Amin Filomeno



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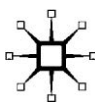
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Monsanto and Intellectual Property in South America

Felipe Amin Filomeno

Assistant Professor, Universidade Federal De Santa Catarina, Brazil

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*To the memory of,
and in honor of the legacy of,
Giovanni Arrighi*

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The research that resulted in this book started when I became ‘research apprentice’ for Giovanni Arrighi at Johns Hopkins University in 2007. Giovanni incited me to study the relations between labor, land and development in Brazil and I chose soybean agriculture as a case for analysis. Soybeans were among the top agricultural products of Brazil; their production contributed to economic growth and export revenues but was also charged with environmental degradation, displacement of rural populations and endangerment of food security. While studying Brazilian soybean agriculture in the context of South America, I became more interested in the relations between intellectual property and development than in labor and land issues.

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Abbreviations and Acronyms

ABAG	Brazilian Association of Agribusiness
ABRANGE	Brazilian Association of Producers of Non-Genetically-Modified Grains
ABRASEM	Brazilian Association of Seeds and Seedlings
ACTA	Anti-Counterfeiting Trade Agreement
ANA	National Articulation of Agro-ecology (Brazil)
APROSEMP	Association of Seed Producers of Paraguay
APROSMAT	Association of Seed Producers of Mato Grosso (Brazil)
APROSOJA	Brazilian Association of Soy Growers
APROSOJA-MT	Association of Soy Growers of Mato Grosso (Brazil)
APROSOJA-RS	Association of Soy Growers of Rio Grande do Sul (Brazil)
APS	Association of Soy Growers (Paraguay)
ARPOV	Argentine Association for Protection of Plant Varieties
ASA	Association of Argentine Seed Companies
ASPTA	Assistance and Services to Projects in Alternative Agriculture (Brazil)
ASTI	Agricultural Science and Technology Indicators
BRASPOV	Brazilian Association of Plant Breeders
CADE	Administrative Council of Economic Defense (Brazil)
CAP	Agricultural Coordination of Paraguay
CAPECO	Paraguayan Chamber of Exporters and Traders of Grains and Oilseeds
CARBAP	Confederation of Rural Associations of Buenos Aires
CASEM	Argentine Chamber of Seed Multipliers
CGIAR	Consultative Group on International Agricultural Research

CNA	National Confederation of Agriculture (Brazil)
COBRAFI	Brazilian Council of Phytosanity
CONASE	National Committee on Seeds (Argentina)
CONINAGRO	Intercooperative Confederation of Agriculture and Livestock (Argentina)
CONTAG	National Confederation of Rural Workers (Brazil)
CRA	Argentine Rural Confederations
CTNBio	National Technical Committee of Biosafety (Brazil)
ECLAC	United Nations Economic Commission for Latin America and the Caribbean
EMBRAPA	Brazilian Corporation for Agricultural and Livestock Research
FAA	Argentine Agrarian Federation
FAMATO	Federation of Agriculture and Livestock of Mato Grosso (Brazil)
FAO	Food and Agriculture Organization of the United Nations
FARSUL	Federation of Agriculture of Rio Grande do Sul (Brazil)
FECOPROD	Federation of Cooperatives of Production (Paraguay)
FETAGRS	Federation of Agricultural Workers of Rio Grande do Sul (Brazil)
GDP	Gross Domestic Product
GM	Genetically Modified
GMO	Genetically Modified Organism
IAC	Agronomic Institute of Campinas (Brazil)
IICA	Inter-American Institute for Cooperation on Agriculture
INASE	National Institute of Seeds (Argentina)
INBIO	Institute of Agricultural Biotechnology (Paraguay)
INPI	National Institute of Industrial Property (Brazil)
INTA	National Institute of Agricultural and Livestock Technology (Argentina)

IP	Intellectual Property
IPTA	Paraguayan Institute of Agricultural Technology
ISGA	International Soy Growers Alliance
MERCOSUR	Southern Common Market
MST	Landless Rural Workers' Movement (Brazil)
NGO	Non-Governmental Organization
OCB	Organization of Brazilian Cooperatives
PAC	Program of Acceleration of Growth (Brazil)
PARPOV	Paraguayan Association of Plant Breeders
PT	Workers' Party (Brazil)
R&D	Research and development
RR	Roundup Ready™
RRBt	Roundup Ready™ Bt
SAGPyA	Secretariat of Agriculture, Livestock, Fishery and Food (Argentina)
SENASA	National Seed Service (Argentina)
SENAVE	National Service for Plant and Seed Quality and Health (Paraguay)
SNPC	National Service for Protection of Cultivars (Brazil)
SRA	Argentine Rural Society
TRIPS	Treaty on Trade-Related Aspects of Intellectual Property Rights
UGP	Union of Production Guilds (Paraguay)
UNICOOP	National Central of Cooperatives (Paraguay)
UPOV	International Union for the Protection of New Varieties of Plants
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

1

Introduction

For most of human history, knowledge created by man was treated either as communal property or as pertaining to the public domain. As communal property, it is understood as traditional knowledge passed over through generations of a regional, indigenous or local community distinct from the state and from private actors. When in the public domain, human knowledge is embedded in activities, assets and institutions that are not objects of property rights and, therefore, belong to the public as a whole. Increasingly, however, the creation, use and distribution of human knowledge have been governed by private intellectual property (IP) rights established by the state. These are legal rights that assign individual actors with some degree of exclusivity over creations of the mind. Since the establishment of private IP, knowledge that is communal or is in the public domain has been encroached by the price mechanism of the market and/or by the regulatory power of the state.¹ The implications are enormous because the creation, use and distribution of knowledge are pervasive aspects of human life. Private IP rights can encourage the production and disclosure of new knowledge but they also set limits on its diffusion throughout society, affecting how people have access to knowledge-intensive goods such as medicines, seeds and books.

The origins of private IP can be traced back at least to the 6th century BCE, when the government of the Greek city-state of Sybaris instituted patents of one year for those who discovered new refinements in luxury. Nevertheless, it was only in Venice during the 15th century CE that a formal system of IP resembling contemporary

models was established. From Venice, IP regulations were exported to other European countries and their colonies. In the late 19th century, the first international treaties about IP – the Berne and Paris conventions – were signed. In 1967, these and other treaties started to be administered by the World Intellectual Property Organization (WIPO), a multilateral institution created to promote a global IP system. The result is a patchwork of national and international IP regimes that today governs the creation and flow of knowledge within and across countries with all the implications for technological development, poverty reduction, food security and public health.²

The subject of IP started to draw more attention from scholars, policy-makers and civil society in the early 1980s, when the US government and its allies launched a global upward ratchet of IP protection. An international coalition led by the US demanded from other countries legislative reforms and enforcement practices that increased the scope and strength of private IP rights.³ This culminated with the Treaty on Trade-Related Aspects of Intellectual Property Rights (TRIPS) signed in 1994 by the members of the World Trade Organization (WTO), then under creation. TRIPS is the most encompassing IP treaty in world history. With a membership of 159 countries as of August 2013, it covers virtually all forms of IP (copyrights, patents, trademarks, plant varieties and so on) and specifies enforcement procedures. By referring to norms of previous IP treaties and by having a dispute settlement mechanism under the WTO, TRIPS constitutes a global IP regime.

Despite the diffusion of IP across the globe and its crowning with TRIPS, today there are still wide variations from country to country in the scope and strength of IP rights (Deere 2009). However, as pointed out by Shadlen and Haunss (2009: 2),

most [of the studies about IP] focus on national and international IP laws. But while laws are the solidified results of social struggles and political conflicts, understanding the law itself tells us little about the social processes that lay behind laws and even less about *the social dynamics that will eventually challenge and often change them* It is time, therefore, to reorient analysis of the politics of IP to the processes by which conflicts over ownership, use,

and control of information are manifest and resolved in regional, national and sub-national settings. (emphases added)

This is precisely the task I proposed myself when writing this book. Here, I use the case of Monsanto in South American soybean agriculture to theorize about the emergence and change of IP in ways that challenge major theoretical perspectives on the theme.

In the words of *The Economist*,

Few companies excite such extreme emotions as Monsanto. To its critics, the agricultural giant is a corporate hybrid of Victor Frankenstein and Ebenezer Scrooge, using science to create foods that threaten the health of both people and the planet, and intellectual-property laws to squeeze every last penny out of the world's poor.... To its admirers, the innovations in seeds pioneered by Monsanto are the world's best hope of tackling a looming global food crisis. (19 November 2009)

One of the most important markets for Monsanto is soybean agriculture, a major world industry. Soybeans are used for a wide range of applications, from feeding livestock and producing biofuels to textile fibers and plastics. According to the Food and Agriculture Organization of the United Nations (FAO), in 2011 soybeans were the third main crop in the world in value of production, placed only after rice and wheat. Monsanto provides soy growers around the world with the herbicide glyphosate – sold under the trademark 'Roundup' – and with soybean seeds that were genetically modified (GM) to resist glyphosate – 'Roundup Ready' (RR) soybeans.⁴ RR soybeans are the most largely cultivated transgenic crop in the world and around half of world soybean production comes from Argentina, Brazil and Paraguay. The dramatic expansion of the crop that took place in these countries since the 1990s was fostered by the adoption of the 'Roundup' technological package, including both the herbicide and the GM seeds developed by Monsanto (Robinson 2008: 84–94).

Monsanto's actions to control the RR technology in Argentina, Brazil and Paraguay through IP were very contentious. After failing to obtain a patent on RR soybeans in Argentina, Monsanto suspended research and development (R&D) programs in the country,

sued exporters of Argentine soybean products in Europe, lobbied for changes to Argentine legislation and refused to release new technology in the country. In Paraguay, in the absence of a patent, Monsanto implemented a private system of royalty collection that virtually eliminated the right of rural producers to save seeds from their own fields for future cultivation. In Brazil, the enforcement of a similar system prompted a series of legal battles between the company and rural producers, who argued that Monsanto was charging royalties based on expired patents and under a mechanism that contradicted Brazilian and international law.⁵

These conflicts are the historical reality I use to develop a theory about transnational and country-specific processes that shape IP regimes. For Latin America, much is at stake when we speak of IP. Historically, the region has suffered from technological dependence on the Global North and IP regimes set the terms and costs with which foreign technology is accessed and used by local actors. IP rules also affect how the region's biodiversity – from native varieties of maize in Mexico to indigenous fruits in the Amazon – is managed and how its economic benefits are shared between local communities, researchers and consumers. After neoliberal reforms in the 1990s and a boom in commodity prices in the 2000s, export-oriented agriculture proved to be a key industry for Latin American development. IP regimes can encourage private and foreign investment in the R&D of new plant varieties but they can also make this technology expensive and hard to develop locally, allowing export revenues to be syphoned out from the region through royalty payments.

In times of a global food crisis, it is vital that we understand how genes and seeds are enclosed from the commons, excluded from the public domain and constructed as private property. This will help us build IP regimes that not only encourage the development of agricultural biotechnology but also assure that this technology will be affordable and widely disseminated. This will require balancing control and exclusion with dissemination and collaboration in the production, distribution and use of knowledge.

Three perspectives on intellectual property

In one of the most comprehensive historiographies of IP, May and Sell (2006: 28–31) developed a useful classification for theories of

institutional change in IP. It consists of three categories: realist, functionalist and critical perspectives.

In international relations theory, realism is a school of thought that conceives of world politics as driven primarily by the actions of unitary, competitive and self-interested states. From a realist perspective, IP regimes are a product of intentional design and enforcement by states guided by their national interest. This perspective is particularly pronounced in the study of international IP regimes because states are the major players in the creation of international treaties and organizations that are concerned with IP. The state-centric orientation of realist perspectives obstructs the analysis of IP for two main reasons. First, actors other than the state (such as business agencies and social movements) have 'frequently prompted changes in intellectual property protection' (May and Sell 2001: 470). Second, the formulation and enforcement of IP rights by the state has not been the simple materialization of a national interest in IP but a result of pressures from different actors within and outside the state.

Functionalism is an approach in the social sciences that conceives of society as an organism with needs that must be satisfied for its existence and reproduction. The behavior patterns of individuals, groups and organizations – as well as the institutions that result from their interaction – are explained by the function they perform in satisfying social needs. From a functionalist perspective, the institution of private IP emerges to satisfy the social need for innovations and for coordination in transactions involving knowledge-goods.

Once creations of the mind are disclosed to the public, they can often be emulated and reproduced by 'free riders' without the investment originally necessary for their development. Under such conditions, profit-oriented individuals would not be willing to bear the costs of developing knowledge-goods and society would therefore suffer from technological underdevelopment. With private IP rights, innovators can ban others from using the knowledge-goods they create or they can charge some economic compensation for the use of such products by others. Private IP rights would thus approximate the inventor's individual rate of return to the social rate of return on the investment in innovations, thereby stimulating the influx of technology needed for social progress (North 1981: 164–6). Private IP rights would also perform the social function of coordinating economic transactions that involve knowledge-goods. Markets

are not efficient if actors have to constantly renegotiate bilateral transactions. Shared rules about IP allow actors buying and selling knowledge-goods to dispense those renegotiation efforts, reducing the costs of transactions and making them more predictable (May and Sell 2001: 471).

Functionalist accounts of IP are problematic because they do not recognize that, historically, IP regimes have reflected the 'ability of powerful actors and groups to enhance their interest at the expense of others.... history is not linear but driven by contestation' (May and Sell 2001: 470). In addition, explaining the creation of private IP based on the incentives it gives to socially needed innovations 'predicts very little about the structure of intellectual property rights, except for the implication that intellectual property rights need to be as strong as possible in order to maximize the incentives' (Ghosh 2006: 97). On a more basic level, the markets assumed in functionalist accounts of IP are themselves historically specific institutions created by social actors. Much of human knowledge is still not produced for profit and has not been commodified. Instead, it is either communal property or in the public domain.

In the case of plant genetic resources, the relationship between private property, communal property and the public domain can be understood in terms of two seed systems conceptualized by De Schutter (2009). First, the traditional seed system: farmers locally and informally develop and trade new varieties of plants relying on a common or public pool of genetic resources. A fundamental practice for the operation of this system is the millenary tradition of farmers of saving seeds from their fields for future cultivation. For rural social movements, the right to save seeds derives from the fact that rural communities have contributed to the creation, conservation and improvement of genetic resources in agriculture. From this perspective, the knowledge embodied in seeds is, at least in part, communal property. Second, the commercial seed system: new plant varieties are developed separately from farming by private companies that rely on private IP rights to market seeds and extract rents from their use by farmers. Through IP rules and enforcement practices, states can protect, foster, restrict or link each of the two systems. In fact, it can not only regulate but also directly participate in those systems through public agricultural R&D, whose products can either be treated as private IP property (in the commercial seed system) or be released in the

public domain. Consistently with the global strengthening of private IP, the history of plant breeding since the last quarter of the 20th century has been characterized by an expansion of the commercial seed system to the detriment of the traditional seed system.

Realist and functionalist perspectives are often merged in mainstream discourse about IP. Duffy (2004: 32), for instance, states that 'The policy reasons for allowing private rights in [IP] ... [are that the] rights encourage the development of the property in the first place. If too few rights are conferred, the investment necessary to create the property ... will not be made'. In this approach, IP is presented as product of intentional design by a policy-maker and as a result of the social need for investment in knowledge-goods. In the *Handbook of Intellectual Property* (2004) published by the WIPO, the creation of the Paris convention in 1883 is explained as a consequence of 'the development of a more internationally oriented flow of technology and the increase in international trade', which 'made harmonization of industrial property laws urgent in both the patent and the trademark field' (WIPO 2004: 241). In this account, states intentionally convened to design rules with the goal of making international transactions with knowledge-goods more efficient.

In contrast, critical approaches to IP consider its emergence and change a product of conflicts between ideas, material capabilities and institutions (May and Sell 2001: 473–4). Social power relations and institutions are not taken for granted; they are called into question as 'the creation and protection of intellectual property' is seen as 'a complex web of social relations, one in which the participants have duties as well as rights, privileges and liabilities as well as powers' (Marlin-Bennett 1995: 119). Critical approaches overcome the limits of realism by taking into account the role of non-state actors in IP rule-making while still seeing IP regimes as partly shaped by interest-driven behavior and competition. They also avoid the pitfalls of functionalism by putting the agency of individual actors and conflicts of interests in the core of the explanation. However, unlike functionalist and realist theories that offer a clear rationale behind the evolution of IP regimes, the critical approach to IP has so far provided only an empirically informed assortment of conditions affecting institutional change in IP.⁶ Political institutions, ideology of state elites, interstate relations and levels of economic development are eclectically presented as variables explaining IP regimes on

the national and international levels. In studies about the contemporary period, the story is generally of a strengthening of IP regimes in developing countries in response to coercion from the US government, with a few countries being able to resist because of the strong capacity of their states.

These three perspectives on IP can be traced back to (and subsumed under) two broad schools of thought defined according to their different approaches to social institutions (Knight 1992: 5). The first school emphasizes the development of institutions as a process of coordination of interests toward the collective benefit. The seminal ideas of this approach can be found in the works of Thomas Hobbes, David Hume, Adam Smith and Herbert Spencer. Realist perspectives that focus on national IP law as the result of intentional design by the state are inscribed in this school. Functionalist accounts that conceive of IP regimes as evolving functionally to meet the needs of market economies also fall in this category. By contrast, the second school of thought explains social institutions 'in terms of their beneficial effects on particular segments of the community. It suggests a central focus on the *conflict of interests* inherent in distributional questions' (Knight 1992: 8, emphasis added). The classical references for this school are the works of Karl Marx and Max Weber. Critical approaches to IP follow this tradition.

In the following section, I show how the case of IP in South American soybean agriculture challenges fundamental assumptions of realist and functionalist perspectives while presenting puzzles that invite an elaboration of critical approaches to IP regimes.⁷

The puzzle of intellectual property in South American soybean agriculture

By the 1970s, the US had lost its economic superiority in the world economy. The country was facing competition not only from Western Europe and Japan but also from countries that had applied 'developmentalist' policies with some success (Wallerstein 2002). To prevent further erosion of their economic power, in the 1980s the US government and transnational corporations launched a global upward ratchet of IP protection (Chang 2001: 4). They demanded from other countries international treaties, reforms to national legislation and enforcement measures that increased the scope and

strength of private IP rights. Through the use of 'soft power', commercial sanctions and non-democratic international negotiations, their goal was achieved with the signature of TRIPS in 1994 (Drahos 2002).

TRIPS substantially raised the standards of protection to private IP. Its main beneficiaries were knowledge-intensive industries from the Global North, which became able to extract higher rents from the economic use of their proprietary technology worldwide. In contrast, the treaty failed 'to offer any protection to the traditional knowledge, genetic resources and folklore that constitute much of the intellectual wealth of the South' (Dreyfuss 2009: 1). TRIPS was paralleled and followed by the insertion of IP provisions in bilateral, regional and plurilateral treaties promoted by the governments of core countries and their IP-reliant industries. The overall result was an enlargement and strengthening of the realm of private IP at the expense of communal IP and the public domain of knowledge.

Agricultural biotechnology was one of the key industries in which the US still had a competitive advantage to protect (Chase-Dunn et al. 2008: 1) and Monsanto was one of the main companies in this business. In the 1980s the transnational corporation, based in St Louis, Missouri, was among the first to genetically modify a plant cell and to conduct trials of GM crops. In the 1990s, the company increased its participation in agricultural biotechnology through mergers and acquisitions, diverting from its original focus in the chemical sector. Being a knowledge-based company operating transnationally, Monsanto became a promoter and beneficiary of the global trend toward stronger IP launched by the US government. Since the mid-1990s, the expansion of soybean agriculture in South America has relied heavily on the incorporation of Monsanto's seed and herbicide technologies. The company has employed different strategies in the region to control these technologies through IP, building up on the minimum levels of protection that had been set by TRIPS and by the 1978 convention of the International Union for the Protection of New Varieties of Plants (UPOV).⁸ By 1999, Argentina, Brazil and Paraguay were all signatories of these two treaties.

What was happening in South American soybean agriculture was actually integral to larger processes pertaining to neoliberal globalization. The global upward ratchet of IP protection was itself part of the 'switch of US policies towards the Third World from the promotion of the "development project" launched in the late 1940s and

early 1950s to promotion of the neo-liberal agenda that later came to be known as the Washington Consensus' (Arrighi and Zhang 2010: 2). Liberalization of international trade and investment, privatization of state assets, removal of government incentives to industrialization, and monetary and fiscal austerity became the central pieces of the policy package recommended by the US government, the International Monetary Fund and the World Bank to Latin American countries in the 1990s. Stronger private IP rights were consistent with neoliberal reforms in several ways. On a basic level, they meant the commodification of knowledge and the extension of market relations to the realm of knowledge production, diffusion and use. Furthermore, stronger IP rights were expected to attract foreign R&D investment to the region and to increase the international trade of knowledge-goods.

In the 1980s and early 1990s, Latin American states were facing severe financial problems, economic recession and hyper-inflation, which made them vulnerable to pressure from foreign creditors in economic policy-making. Thus, by the mid-1990s, most Latin American governments were adopting the neoliberal agenda. Among them were the administrations of Carlos Menem in Argentina (1989–99), Fernando Henrique Cardoso in Brazil (1995–2003) and Juan Carlos Wasmosy in Paraguay (1993–98). US commercial sanctions, expectations of increased foreign direct investment and promises of broader access to the US consumer market led those governments to sign TRIPS and UPOV 1978, with the ensuing obligation of reforming national laws to match their minimum standards (Velho 1995: 9–10; Rodríguez 2003: 509–12; Hermann 2004; Brun 2010: 63).

Menem, Cardoso and Wasmosy also liberalized international trade and foreign investment, encouraging transnational agribusiness corporations to lead a process of mergers and acquisitions with local companies. Consistent with the goal of reducing state intervention in the economy, public investment in agricultural R&D was decreased or flattened. The result was transnationalization, concentration and privatization of industries up- and downstream of the farming sector (including the seed industry) (Wilkinson 2009). Within the farming sector, large-scale, capital-intensive, export-oriented agriculture (as soybean production tends to be) benefited the most from neoliberal reforms. Taxes on agricultural exports and on imported agricultural inputs were reduced, allowing rural producers to update

their production methods and appropriate export rents. Large rural producers, with more capital, easier access to credit and economies of scale, were in a better position to face market liberalization than smallholders. Agriculture – and the primary sector in general – was seen by neoliberal policy-makers as the industry where Latin America's comparative advantages 'naturally' lay. Export revenues generated by agriculture were crucial for the payment of foreign debt and to sustain monetary stabilization policies. Even after the early 2000s, when neoliberal governments were replaced by left-of-center administrations, export revenues and taxes generated by agriculture became strategic resources for 'neodevelopmentalist' economic and social policies.

However, in spite of all this context, there was not a uniform reproduction of the global trend toward stronger private IP in South American soybean agriculture. National IP regimes on seeds were unevenly integrated into the international IP regime embodied by TRIPS and the UPOV conventions. By 2013, Argentina's national IP regime on seeds still provided relatively weak protection for private IP rights on plant varieties. Rural producers could save seeds of protected varieties from their own harvests for future cultivation without paying royalties to seed companies. Enforcement practices were limited and the use of certified seeds was low. In contrast, the national IP regimes on seeds in Brazil and Paraguay set quantitative restrictions on the right to save seeds. The Brazilian regime went even further by incorporating the concept of 'essentially derived' plant varieties. According to the most restrictive version of the UPOV convention (the act of 1991), if a new variety is distinguishable but predominantly derived from an original protected variety, its commercialization by the plant breeder is conditional on authorization by the owner of the original cultivar.⁹ Moreover, in both Brazil and Paraguay the use of certified soybean seeds was higher than in Argentina, suggesting a stronger enforcement of IP laws in those countries.

In South American soybean agriculture as a whole, a private and transnational IP regime was also unevenly implemented. Capitalist actors often operate transnationally but the rules regulating their activities are designed and enforced by national states. Historically, this has been at the basis of recurrent tensions between business and state actors. The demands of transnational capital for harmonized

rules that facilitate its operation around the world have been important reasons behind the creation of international regimes for trade, investment and IP (many times with the opposition of other fractions of capital, labor and segments of the civil society). This, however, has not prevented transnational private actors from trying to design and enforce their own regimes. In 2004, the transnational corporation Syngenta – one of the largest seed companies in the world, based in Switzerland – published a controversial advertisement with a map in which a large area of South America covering parts of Argentina, Brazil, Bolivia, Paraguay and Uruguay was shaded in green and labeled ‘United Soy Republic’ (Robin 2008: 273). The advertisement is emblematic of how the space of capital accumulation does not coincide with national jurisdictions. The space of the ‘United Soy Republic’ roughly corresponds to the space where Monsanto has gradually implemented a private system of royalty collection – a corporate seed system partially embedded in those national and international IP regimes but also partially contradicting and bypassing them. The system involves rules established in private contracts and enforcement instruments such as the charging of royalties during the sale of harvests by rural producers to crushing industries or trading houses. It also includes the implementation of fines for rural producers that do not declare the presence of RR soybeans in their harvests but have them detected by tests applied during harvest sales. In Argentina, the system was never implemented because Monsanto could not even obtain a patent on RR soybeans in the country. Conversely, in Brazil and Paraguay the mechanism was installed nationwide, virtually eliminating the right of soy growers to freely save RR seeds, solving the company’s problems with soybean seed piracy.¹⁰

In sum, the global trend toward stronger private IP was reproduced in Brazil and Paraguay to a larger extent than it was in Argentina. Restrictions imposed on the right to save seeds in Brazil and Paraguay limited communal forms of property associated with the traditional seed system, while the adoption of the concept of essentially derived varieties in Brazil eroded the public domain in plant genetic resources. Before these restrictions were in place, plant technology resembled an ‘open source’ technology such as the computer operating system Linux. Plant breeders and farmers could act as tweekers – innovators who improve knowledge by refining what

others have done (Raustiala 2010) – developing new seed varieties from existing ones and commercializing them with no restrictions. Under the new rules, plant technology became more similar to ‘closed source’ technologies such as Microsoft Windows. In comparison to Argentina, soybean seed technology in Brazil and Paraguay became more confined within the corporate seed system and more regulated under the paradigm of private IP.

This cross-national variation – consisting of an uneven imbrication of national, international and transnational IP regimes – is puzzling from different perspectives. IP in South American soybean agriculture was fundamentally shaped by conflicts between Monsanto, government agencies and rural producers, which challenges the realist conception of IP as a product of design by a unitary state guided by the national interest. The very existence of a transnational private IP regime is missed in the state-centric orientation that characterizes realist approaches. The preponderance of conflicts of interests in the formation of IP regimes in South American soybean agriculture also defies the functionalist view of a linear move toward stronger private IP in response to social needs.

Functionalist perspectives on private governance in international affairs are also brought into question. Several scholars have pointed out the growing importance of ‘private authority’ in the global governance of specific issue areas, from sustainability in the agro-food sector to technical standard-setting in financial accounting (Cutler, Haufler and Porter 1999; Hall and Biersteker 2002; Arts 2003; Pattberg 2004; Mattli and Buthe 2006). In many of these accounts, transnational systems of governance are depicted as emerging legitimately from the interaction between private actors in a context where the state (because of lack of capacity, will or ideology) is not providing or enforcing the rules needed for transactions to be efficient. This is a narrow perspective on transnational governance that resembles the functionalist approaches to IP that I criticize in this book. As pointed out by Dingworth (2007: 3), the democratic potential of transnational rule-making depends on how inclusive the decision-making process is of important stakeholder groups, and whether it is transparent and sincerely deliberative. Where such conditions are lacking, transnational governance has weak legitimacy. As we shall see, the implementation of Monsanto’s system of royalty collection relied on coercion and co-optation of some associations

of rural producers, local seed companies and national governments, bringing its legitimacy into question. This is why Syngenta's imagined 'United Soy Republic' could never truly be a republic. Moreover, following Ponte, Gibbon and Vestergaard (2011), I argue that transnational authority does not necessarily emerge as state authority retracts; the relation is more complex, with partial imbrications and contradictions between the two.

The case of IP in South American soybean agriculture also poses questions for critical perspectives on IP. One of the key theories in this approach is that the relationship between the degree of protection for IP and the degree of economic development in countries has the form of a U-shaped curve: high levels of protection prevail in low and high income countries and low levels of protection tend to exist in middle-income countries. When incomes and technical capabilities are low, access to technology depends on its import, which is usually conditional to strong IP protection. As 'incomes and technical capabilities grow to intermediate levels, adaptive innovation emerges, but competition remains focused largely on imitation, so that the bulk of economic and political interests [in a country] prefers weak protection. As economies mature to higher levels of technological capacity and as demands for high-quality, differentiated products increase, more domestic firms favor effective IP [rights]' (Maskus 2000: 144). In South American soybean agriculture, Argentina is the country that historically has had the highest levels of economic development (especially in agriculture). Local private seed companies already existed in the country in the 1920s. Paradoxically, it is also the country with the most permissive IP regime on seeds. The Argentine case becomes even more puzzling when we consider that the country was the 'poster child' of neoliberal reforms in Latin America, the first in the Southern Cone to recognize IP rights on plant varieties and a target of pressure from the US government and Monsanto to change its IP regime.

Another theory often found in critical studies of IP states that developing countries with stronger state capacity in IP (broadly conceived as bureaucratic resources to formulate and enforce IP rules) are more likely to resist foreign demands for stronger IP and to adapt IP rules to national development goals (Drahos 2002; Latif 2005; Deere 2009). Historically, Brazil has been a leader among developing countries in international IP negotiations. Its strong capacity to

shape IP regimes was displayed internationally in the 2000s when the Brazilian government successfully confronted the US government and transnational pharmaceutical corporations over patents on anti-HIV medication. Why then has the Brazilian IP regime on seeds changed consistently with the interests of transnational seed companies (Monsanto, in particular)?

Lastly, although critical studies have paid attention to the role of private actors in the formation of IP regimes, they have usually focused on national and international regimes designed and enforced by states under pressure from private interest groups.¹¹ Monsanto's system of royalty collection is something distinct. Partially based on national and international IP regimes, it also partially transgresses them. It implies the elimination of the right to save seeds that is stated in Argentine, Brazilian and Paraguayan law. It is based on patents that are arguably expired in Brazil (Conti 2012) and absent in Paraguay. It is privately enforced: royalties are charged at silos, trading houses and soybean crushing industries; Monsanto's agents apply tests to detect the presence of RR soybeans in harvests and charge farmers fines if undeclared transgenic seeds are found. It is also more complex than private IP contracts commonly found in several other industries because it articulates a whole commodity chain, from the licensing of transgenic technology to local seed companies up to the sale of the harvest by local farmers for industrial processing and exportation.

In the following section, I present a critical theory about the formation and change of IP regimes that solves the puzzles of South American soybean agriculture and accounts for the complexity generated by the intersection of international, national and transnational regimes.

The book argument

My theory of IP regimes unfolds on two levels of explanation. I argue that transnational competition between knowledge-users from developing countries for foreign markets and technology facilitates the reproduction of the global trend toward stronger IP regimes. This can mean an increased integration of national IP regimes into stronger international IP regimes or the constitution of strong private IP regimes within and across national boundaries. However, on the

national level, this is contingent upon country-specific conditions and strategies:

- the relationship between the state and knowledge-users;
- the pattern of competition in the provision of technology;
- the pattern of mobilization of knowledge-users around IP.

As stated by Jullien and Smith (2008: 1–2), globalization is not a process without a subject and ‘the political work’ carried out by actors within industries can explain the specific translations of globalization that manifest in different countries and sectors.

Foreign technology is often crucial for business actors in developing countries to stand competitively in the global economy. Without it, they might lose market share and eventually be marginalized from world markets. Foreign technology can also be instrumental for governments of developing countries in the pursuit of national development goals like economic growth or food security. Hence, these actors tend to compete for foreign technology. Transnational corporations from core countries – backed by their respective states – tend to make the transfer of technology to developing countries conditional on stronger protection for IP. When transnational competition between knowledge-users from developing countries is intense, foreign corporations and governments can more easily impose onto them their demands for stronger IP.

This dynamic finds parallels in the competition between developing countries for foreign direct investment. The term ‘race-to-the-bottom’ has been used to describe the tendency of competing governments to cut taxes, labor standards and environmental regulations in order to attract private investment. In the case of IP, we can speak of a ‘race-to-the-top’, in which higher standards of IP protection are offered to attract foreign technology provided by transnational corporations. It is common sense that private IP rights allow their holders to extract monopoly rents for a limited time. What is less perceived is that when transnational corporations use competition between governments for foreign R&D investment to raise protection for IP they are practicing what Thomas (2010: 10) called ‘corporate rent seeking’.

The TRIPS negotiations were an instantiation of this process on the interstate level. Governments from developing countries facing

financial insolvency were in desperate need of international credit and foreign markets for their exports. They became easy targets for US commercial sanctions designed to obtain their acceptance of TRIPS. As we shall see, this was also the case in South American soybean agriculture. Monsanto – backed by the US government – applied a strategy of ‘divide-and-conquer’ taking advantage of competition between rural producers and governments from Argentina, Brazil and Paraguay in the soybean world market. This was not a symmetrical game taking place on an even playing field. Monsanto applied similar tactics in each of the three countries under a single transnational apparatus. Soy growers, on the other hand, were numerous, dispersed in a vast territory and were represented by different associations that did not cooperate transnationally. Effective cooperation of soy growers with international non-governmental organizations (NGOs) and social movements was also absent. Soy growers engaged in bilateral negotiations with Monsanto, competing with their neighbors for access to seed technology that could improve their position in the world market.

The ‘race-to-the-top’ in IP, however, was not an inexorable force of globalization. Its reproduction in each country depended on the strategies adopted by local actors under conditions specific to their national political economies.

Relationship between the state and knowledge-users

Because developing countries are mostly net importers of technology, knowledge-users are a relatively large and potentially powerful domestic constituency. Their capacity to shape IP regimes, however, depends on the economic and institutional links between them and the state.

On the economic links, I argue that the higher the dependence of the state on the industry controlled by knowledge-users, the more likely the emergence of a weak IP regime biased in their favor. A crucial element here is taxation, which can make the state directly dependent on the industry. In this situation, knowledge-users have more leverage vis-à-vis the state and state officials are less inclined to support IP rules that imply a transfer of income from local knowledge-users to foreign holders of IP rights.

In Argentina, soybean agriculture has for many decades been a major sector of the economy. In the early 2000s, it became a major

source of tax revenues, increasing the power of soy growers in political disputes and creating an affinity of interests between them and state elites in relation to Monsanto's demands. In Brazil, the economy is more diversified and export-oriented agriculture is a negligible source of taxes. Soy growers have less leverage in negotiations with the state and are in a worse position to demand a permissive IP regime. In Paraguay, soybean agriculture is the most important economic activity but Paraguayan landed elites have protected their wealth from taxation and used the state for clientelistic purposes. As a result, the Paraguayan state is very weak and Paraguayan rural producers cannot rely on the government to obtain technology nor to sustain a permissive IP regime contrary to foreign interests.

This causal mechanism is also present in other industries where IP is a contentious matter. In the international controversy over pharmaceutical patents, one of the main motivations behind the activism of governments from developing countries against strong IP was its direct effect on public coffers. Patents implied high prices for drugs that were used in public health programs. The expansion of these programs was dependent on those drugs becoming more affordable and compulsory licenses were instrumental to that.¹² More broadly, when a state relaxes IP regimes to make foreign technology more affordable because of the importance of the affected industry to its economic and political goals, it is acting like states that nationalize foreign capital in industries that concentrate much of a country's wealth (say, for instance, oil in Venezuela or hydrocarbons in Bolivia). The difference is that in these examples capital is physical (factories, mines, ports), while in IP capital is intangible.

On the institutional links, I argue that the more stable and formal the participation of knowledge-users in the making of IP rules, the more likely the emergence of a weak IP regime biased in their favor. Specifically, a weak IP regime is more likely to emerge from a corporatist pattern of IP rule-making, whereas a strong IP regime is more likely to emerge from a pluralist pattern or from what I call 'state capture and abstention'.

In a corporatist pattern of rule-making, peak-level formal negotiations between associations representing different segments of the private sector and state agencies define the rules that apply to their respective policy domain. Typically, these state agencies are part of the executive power. In a pluralist pattern, rules emerge from a more

fluid and fragmented negotiation process in which different interest groups exert pressure on the state on different fronts while competing for influence over a certain policy domain. Here, both the executive and legislative powers are often involved. Under state capture and abstention, powerful individuals, firms or groups are able to disproportionately influence the regulatory activity of the state to their own advantage (state capture) or to entirely substitute for the state in the design and implementation of rules that apply to their respective policy domain (state abstention). State capture does not necessarily involve illicit means of influence but the relationship between those powerful actors and the state tends to be direct, informal and non-transparent.

In IP politics, there is generally an asymmetry between IP-holders and knowledge-users. Whereas the first are increasingly large corporations that operate transnationally, the latter are much more numerous, smaller and territorially scattered individual actors. In a corporatist pattern of rule-making, this asymmetry is partially offset because associations representing IP-holders and knowledge-users have equivalent formal, direct and continued participation in IP rule-making. This also allows associations of knowledge-users to gain expertise in a technical policy matter, which compensates for the fact that large corporations usually have expertise in IP law and can afford assistance by IP attorneys. Under pluralism or state capture and abstention, the asymmetry between IP-holders and knowledge-users is not corrected and tends to translate into rules biased toward the interests of IP-holders. Large corporations (or the associations that represent them) often have direct access to government officials and more resources to influence government agencies. In addition, associations representing knowledge-users do not have the opportunity to learn about IP through systematic participation in rule-making. As we shall see, the making of IP rules has resembled a corporatist pattern in Argentina, a pluralist pattern in Brazil and state capture and abstention in Paraguay.

Institutional links between the state and knowledge-users are relevant not only for national IP regimes but also for the formation of international IP regimes. One of the most recent attempts of core countries to raise international standards of IP protection is the Anti-Counterfeiting Trade Agreement (ACTA). Growing public mobilization emerged around this treaty, with NGOs claiming its strong

bias in favor of corporations from the Global North is a result of a pattern of rule-making in which organizations representing the interests of knowledge-users played no part (Knowledge Ecology International 2012).

Pattern of competition in the provision of technology

Cross-national variation in the structure of the industry providing the technology that is the object of IP also affects IP regimes. When technology is supplied by foreign actors, there are no local holders of IP rights demanding strong protection for IP. However, at the same time, local knowledge-users are likely to offer strong protection for IP as a way to encourage foreign actors to provide them with technology. In the presence of strong state capacity in IP, local knowledge-users might mobilize their government to counter foreign demands for stronger IP and try to cheapen access to foreign technology by weakening IP rights. In contrast, when technology is substantially provided by local actors, there will be a sizable number of local IP-holders demanding strong protection for IP. Local knowledge-users will be less likely to oppose strong protection for IP because the participation of local actors in the supply of technology promotes competition and reduces its price. Thus, the pattern of competition in the provision of technology affects IP regimes simultaneously through the interests of local IP-holders in stronger protection for IP and through its effects on the disposition of local knowledge-users to accept stronger IP protection.

By 2009, the four largest seed companies in the world – Monsanto being the largest – alone accounted for 58 per cent of global seed sales (ETC Group 2011: 22). In South American soybean agriculture, the supply of seeds became more concentrated, transnationalized and privatized after 1980 but wide cross-national variations in the provision of seed technology have persisted, especially in the role performed by the state. In Paraguay, the technological capacity of the national seed industry remained very small. Local rural producers and the state had to offer strong protection for IP in exchange for foreign-owned plant technology. In Argentina, there are a few relevant local seed companies but they operate along with transnational corporations that have much stronger technological capacity. The state agricultural R&D agency (INTA), which led the provision of soybean seed technology up to the early 1980s, eventually became a

minor player in this market and only recently started to recover. The state, therefore, had no direct interest in raising the protection for IP in soybean seeds. At the same time, soy growers mobilized the state to guarantee the right to save seeds as a way to offset the foreign-led oligopolization of seed technology. In Brazil, the state agricultural R&D agency (EMBRAPA) is a major player in the seed market and became an advocate of stronger IP. Brazilian rural producers can rely on this agency as an alternative source of technology and as a promoter of competition in the seed industry, which helped tame their resistance to stronger IP.

The case of EMBRAPA reveals some parallels between the politics of IP and the politics of biosafety in agriculture. As pointed out by Paarlberg (2001: 2), if agricultural biotechnology is seen emerging 'from scientists working for national development purposes within publicly financed national laboratories, local political resistance [against the technology] could diminish.' In Brazil, the growing capacity of EMBRAPA in conventional and transgenic seed technology, as well as its joint-ventures with transnational seed companies, contributed not only to spread agricultural biotechnology in the country but also to tame the resistance of local soy growers against stronger IP.

Pattern of mobilization of knowledge-users around IP

The stronger the mobilization of knowledge-users in IP conflicts, the more likely the emergence of a permissive IP regime. Following Sell and Prakash (2004) and Haunss and Kohlmorgen (2010), I argue that the strength of the mobilization of knowledge-users in IP disputes is positively correlated with:

- the organizational stability of their political representation;
- the degree of coordination between the organizations that represent them;
- the existence of independent channels for the representation of knowledge-users most sensitive to the costs of IP;
- their ability to produce a public discourse capable of drawing the support of a broad coalition.

In Argentina, soy growers participated in the politics of IP through four associations that for decades had been their interlocutors with

the state. In spite of their differences, these organizations increasingly cooperated on national scale during IP disputes. One of them – the Argentine Agrarian Federation (*Federación Agraria Argentina* – FAA) – represented small rural producers, articulating their demands in terms of national sovereignty and counting on the support of IP experts that served as organic intellectuals. In Brazil, the organizations representing rural producers in IP conflicts changed over time. In the 1990s, the associations that represented them also represented segments of the agribusiness that had conflicting interests in relation to IP (such as seed companies and transnational corporations). Lawsuits, parliamentary lobby and other strategies were carried out independently by associations at state level instead of on a national front. Their discourse was focused on the distributive aspects of IP disputes (royalty values) as opposed to broader issues that could have enlarged their basis of support (such as national sovereignty or food security). In Paraguay, the mobilization of rural producers was even weaker. The set of agrarian organizations that represented Paraguayan rural producers in negotiations with Monsanto also represented other segments of the commodity chain (local seed companies, crushing industries, exporters), which made it difficult for rural producers to defend their interests independently. The main association representing soy growers (APS) was very young and lacked minimal organizational resources.

Lastly, I argue that the virtual absence of cooperative links between associations of soy growers and NGOs interested in agriculture limited their capacity to shape IP regimes in Argentina, Brazil and Paraguay. Like soy growers, NGOs and rural social movements can be critical of stronger IP in agriculture and of the dominant role of transnational corporations. However, they are also highly critical of soybean agriculture and biotechnology altogether, which hindered the formation of a coalition around IP issues. This is in sharp contrast with the case of pharmaceuticals, where a transnational network of NGOs was an ally of the pharmaceutical industry of developing countries and their governments in challenging the IP claims of transnational corporations (Sell and Prakash 2004).

Combining the three country-specific explanations presented above, I claim that:

- In Argentina, the global trend toward stronger IP was hindered because, in the face of a foreign-led privatization of the seed

industry, a highly mobilized constituency of rural producers used its corporatist and economic links to the state to obtain cheap access to foreign technology through a permissive IP regime.

- In Brazil, the global trend was reproduced because the state directly promoted competition in the seed industry through a research corporation that advocated stronger IP, whereas rural producers had weaker links to the state and were less mobilized in the resistance to stronger IP.
- In Paraguay, the weakness of the state as a source of technology and in relation to foreign actors was reinforced by a landed elite that became vulnerable to demands from foreign providers of technology for stronger IP.

To extend my theorization, I classify the outcomes observed in each country using three ideal-typical IP regimes: old developmental, neodevelopmental and dependent. Historically, old developmental 'patent regimes aimed to facilitate local actors' access to and use of knowledge by restricting – and at times prohibiting – patents in certain technological areas' (Shadlen 2011: 144). In the last decades, however, 'the emphasis on innovation [in developing countries] inspires the emergence of 'neodevelopmental' patent regimes [that] supplement the focus on knowledge use with an emphasis on knowledge generation' (Shadlen 2011: 144). Neodevelopmental IP models combine measures to ameliorate the effects that strong patent protection can have on knowledge-users with incentives for innovative activities and patent seeking, especially in incremental innovations that are feasible given the technological capabilities in developing countries (Shadlen 2011: 144). Innovation policy generates new technological capabilities that can make local actors in developing countries more inclined to stronger protection for IP rights (Shadlen 2011: 146).

As we shall see, the overall regulation of IP on plant varieties in Argentina resembled an old developmental model, in which the state and a strong constituency of rural producers sustained weak protection for IP as a way to cheapen access to foreign technology. In Brazil, regulation of IP on plant varieties instantiates a neodevelopmental model, which resulted in part from the increasing technological capacities of the state-owned agricultural R&D corporation. To account for the case of Paraguay, I conceptualize a dependent model of IP, which is characteristic of peripheral countries with low

technological capacity and fragile states. In this model, strong protection for IP rights prevails because of dependency on foreign sources of technology. In the conclusion of the book, I discuss the limits, contradictions and possibilities of each model.

Research design

To develop this theory, I conducted a comparative-historical analysis of Argentina, Brazil and Paraguay from the 1990s to 2013, focusing on the conflicts between Monsanto and soy growers. I combined two methodological strategies corresponding to the two levels of analysis on which the book's argument develops. The first is the transnational level, where transnational competition between soy growers across countries is presented as part of the explanation for variation in IP regimes. The correspondent method is relational comparison, according to which relational processes among the cases under study are taken as potential explanations for similar/different outcomes observed in each of them (Silver 2003: 28–34). The second level is the national, where country-specific conditions and strategies are presented as part of the explanation for variation in IP regimes. The correspondent method is variation-finding comparison, whereby the researcher tries to establish 'a principle of variation in the character or intensity of a phenomenon by examining systematic differences among instances' (Tilly 1984: 82), which are usually traced back to characteristics 'internal' to each case. By combining these two methods, my analysis challenged the traditional divide between international and comparative political economy. The ontological perspective adopted allowed 'for partly autonomous individual [national] processes as well as strong effects on social interaction by ... collectively created structures [transnational processes]' (Tilly 2008: 7). Three national narratives were juxtaposed to reveal not only how local institutions, resources and strategies affected IP regimes but also how connections across the three countries shaped their collective trajectory. To construct the narratives, I relied on data from interviews, official documents, news articles and academic literature.¹³

South American soybean agriculture was selected for investigation not only because of the puzzles it presents for major theories about the formation of IP regimes. Soybeans are the most important

crop in value in Argentina, Brazil and Paraguay. Their production, industrialization and trade are a typical example of nontraditional agricultural exports that 'became a centerpiece of ELD [export-led development] strategies throughout Latin America during the 1980s and 1990s' (Robinson 2008: 56). As it expands to Bolivia, Uruguay and other countries in a global context of high demand for primary commodities, soybean agriculture has gained importance for Latin American (under)development. Furthermore, GM soybeans are the main transgenic crop in the world in size of cultivated area. Much of the conflict over IP on agricultural biotechnology is conflict over soybean seeds. Of course, my case selection also implies limits to the generalizations that can be made from this study, an issue I discuss in the conclusion.

Outline

The remainder of the book is divided in four chapters. Chapters 2, 3 and 4 are about Argentina, Brazil and Paraguay, respectively. Chapter 5 is a conclusion that summarizes the research findings, discusses generalizations to other industries and areas, and draws implications for social theory and IP policy. In each country chapter, the content is presented in narrative form, with a section for the 1990s followed by a section on the 2000s. The narratives have an analytic focus on the conditions and strategies that favored or hindered Monsanto's enterprise and the reproduction of the global upward ratchet of intellectual property protection in South American soybean agriculture. I tried to balance historical and theoretical order so that the reader can have an integral picture of what happened in each country while also attending to explanatory processes that cut across time and space.

2

Argentina: The Old Developmental Model

By 2013, the Argentine IP regime on seeds stood out for its virtual immunity to the post-1980 global upward ratchet of IP protection launched by the US government and to the attempts by Monsanto to establish a private IP regime in South American soybean agriculture. Argentina was the first country in the Southern Cone to have legislation for IP on plant varieties: the 1973 Law of Seeds and Phytogenic Creations. By contemporary standards, this legislation does not provide strong protection for private IP rights on seeds. It balances the interests of seed companies, rural producers and the state by instituting plant breeder's rights on plant varieties with three exceptions:

- the right of rural producers to save seeds;
- the right of plant breeders to use existing protected varieties to develop new ones without consent from the original cultivar owner;
- the right of the state to declare the restricted public use of certain varieties in cases of national interest (an exceptional and temporary enlargement of the public domain).¹

During the four decades that followed the enactment of the law of seeds, several decrees and other forms of regulation (including a new law of patents) were instituted in response to pressures from seed companies and because of international treaties signed by Argentina. By 2013, however, none had effectively limited the three exceptions to plant breeder's rights established in 1973. The enforcement of public regulations by the state has also been limited. Argentina

displays one of the highest rates of seed piracy in soybean agriculture with only 20–30 per cent of soybean seeds cultivated in the country being certified (Rossi 2006; Yakelevich 2009).

The seed industry tried to overcome these limits by creating private regimes governing IP in the commodity chain that links seed companies to rural producers. First, there are license agreements between the larger (mostly transnational) seed companies that develop GM seeds and the smaller (mostly national) seed companies that develop locally adapted cultivars in which the transgenic technology is inserted. Second, there are contracts of 'extended royalties' between rural producers and seed companies through which the former are obliged to pay royalties for saved seeds and allow their farms to be visited by inspectors of the seed industry. Monsanto is involved in both types of contracts but also tried to build its own IP regime for RR soybeans: a private mechanism of royalty collection, charging fees based on the value of harvests sold by rural producers at trading houses or crushing industries. The regime also includes the application of tests to detect the presence of transgenic seeds in the harvests and the charge of fines on rural producers that do not declare that their harvests contain Monsanto's proprietary technology. All these private contracts and mechanisms of enforcement were not effective in eliminating the right to save seeds and seed piracy. Their territorial scope was limited, their legality contested and participant rural producers were either able to bargain against specific rules or not fully comply with them. Monsanto's system, in particular, was never implemented in Argentina.

The endurance of the Argentine IP regime on seeds and the limitations of private IP regimes promoted by the seed industry were the outcome of a long and intense conflict between the Argentine state, the US government, the seed industry and Argentine rural producers. In this chapter, I explain this outcome by showing that, in reaction to a foreign-led privatization of the seed industry, a strong constituency of rural producers mobilized the state to protect the economic surplus of the agricultural sector from appropriation by a foreign company. They used corporatist and economic links to the state and developed a public discourse that raised issues of national and technological sovereignty. Government support was inconsistent and partly self-interested but helped rural producers tame Monsanto's IP offensive for over two decades.

Neoliberalism, intellectual property and Monsanto in Argentine soybean agriculture (1990s)

Despite the enactment of the law of seeds and the regulation of its application by Decree no. 1995 in 1978, protection of IP in plant varieties in Argentina remained ineffective until 1989, when protection started to be enforced on registered varieties of wheat (Gutiérrez and Penna 2004: 8; Brieva et al. 2008: 5). It was also at this point that the Argentine IP regime on seeds became the object of intense conflicts. An increasingly concentrated, privatized and transnationalized seed industry was pressuring the neoliberal administration of President Menem to reform national legislation and enforcement procedures with the goal of increasing the scope and strength of private IP rights on seeds.

In 1991, the executive power issued Decree no. 2183 with a new regulation for the law of seeds. Political pressure exerted by the Association of Seed Companies of Argentina (*Asociación Semilleros Argentinos* – ASA) and other interest groups inside the National Committee on Seeds (*Comisión Nacional de Semillas* – CONASE) was behind the measure (Domingo 2003 quoted in Kesan and Gallo 2005: 119–20). CONASE is a corporatist organ created in the 1970s under the Ministry of Agriculture to advise the state in matters affecting the seed industry. It is constituted by representatives of the seed industry, rural producers and the public sector.

Decree no. 2183 created the National Seed Service (*Servicio Nacional de Semillas* – SENASE) to manage the registration and quality control of cultivars as well as the enforcement of IP rights. Activities previously dispersed across different organs under the Secretariat of Agriculture, Livestock, Fishery and Food (*Secretaría de Agricultura, Ganadería, Pesca y Alimentos* – SAGPyA) were centralized under a single government agency (Kesan and Gallo 2005: 119–20). The decree reaffirmed the right of rural producers to save seeds (Article 44) but specified situations in which consent from the cultivar owner needed to be requested by the rural producer wanting to save seeds, such as the production and reproduction of seeds and the storage of seeds with the purpose of reproduction (Article 41). It also reaffirmed the right of plant breeders to use protected varieties to develop new cultivars without the need of authorization from the owner of the original variety. Moreover, the decree specified procedures for the

declaration of 'restricted public use' of plant varieties by the state (Articles 46–49). The decree adjusted Argentine legislation so that the country could formally join UPOV as a signatory of its 1978 convention (Labarta et al. 2000: 1). This, however, only happened in September 1994 through Law 24.376. Argentina avoided the obligation of adopting the 1991 convention, which would be mandatory for states joining UPOV after April 1999.

Still, in 1991, the executive power, motivated by public authorities and the private sector, issued Decree no. 2817 replacing SENASE with the National Seed Institute (*Instituto Nacional de Semillas* – INASE) (Gutiérrez and Penna 2004: 11; Kesan and Gallo 2005: 119–20). Consistent with the neoliberal orientation of the Menem administration, INASE was designed to be a small, efficient and financially self-sufficient agency with certain spaces for the participation of rural producers and seed companies in decision-making (Gutiérrez and Penna 2004: 11). The creation of INASE was an attempt to improve the enforcement and control of IP in new plant varieties (Kesan and Gallo 2005: 119–20). INASE was endowed with police power to investigate infractions of seed regulations. It can impose administrative sanctions against infractions of the law of seeds, which, if not respected, can lead to judicial processes (interview with INASE, August 2010, Buenos Aires). In spite of this, the protection for IP rights offered by the institute was not effective in the control of seed piracy (GAO 2000 quoted in Kesan and Gallo 2005: 119–20). In part, this is because of the small size of INASE in relation to Argentina's large territory.

These attempts to strengthen the Argentine IP regime on seeds were controversial from the beginning. In 1992, Congressman Marcelo Muniagurria presented a project of declaration (*proyecto de declaración*) according to which the National Congress would demand from the executive power an addendum to Article 27 of the law of seeds forbidding the charge of royalties on seeds and the imposition of sanctions on rural producers that save seeds for their own use (Muniagurria 1992). The project was approved by the Parliament. Muniagurria was a representative of the province of Santa Fe (Argentina's largest soybean producing area), a member of the Peronist Party and a leader of the Rural Confederations of Argentina (*Confederaciones Rurales Argentinas* – CRA). Founded in 1942 by medium and large rural producers from the interior

of the country, CRA is one of the main rural associations of Argentina.

Even within INASE the matter was controversial. Although some of its officials defended the original law of seeds as an adequate foundation for the Argentine IP regime (interview with INASE, August 2010, Buenos Aires), in February 1996 the agency issued Resolution 35 regulating the right to save seeds. The resolution was signed by INASE's president, Adelaida Harries, an advocate of reforms that could bring the Argentine IP regime closer to UPOV 1991.² The regulation did not restrict the right to save seeds itself but contained rules about how the right should be exercised. One of the most questioned rules determined that rural producers needed authorization from the cultivar owner to keep saved seeds stored outside of their property (for instance, in a storing facility belonging to a third person or cooperative). If literally interpreted, this rule discriminates against small rural producers that do not have storing facilities of their own (Herrero 2006: 191). Rural producers' organizations severely criticized the measure and took it as a response of the state to the lobby of seed companies (Fridman 2001: 3). With its legality questioned by rural producers, the prescription did not have practical effects (Herrero 2006: 194).

In March 1996, the head of SAGPyA, Felipe Solá, authorized the commercial cultivation of RR soybeans through Resolution 167. At that point, soybean agriculture was the main crop produced in Argentina and, by the end of the decade, around 90 per cent of soybeans produced in Argentina were of the RR variety (James 1999). RR soybeans were adopted in Argentina and the US at nearly the same time. The governments of both countries actually worked together in an international coalition against restrictions on GM organisms being imposed by European countries. This 'honeymoon' would soon be over as Monsanto and RR soybeans became the core of conflicts over IP on seeds in Argentina.³

RR soybeans were originally marketed in Argentina by Nidera, a transnational seed company based in Rotterdam. In the late 1980s, Nidera acquired the firm Asgrow, to which Monsanto had licensed the RR gene. Nidera had the right to use Asgrow's germplasm and thus to develop seeds with the RR gene. Even after Monsanto bought Asgrow's seed business in the mid-1990s, a 1996 contract authorized Nidera to commercialize RR soybeans seeds, which were actually

distributed to Argentine farmers without purchase contracts (Newell 2009: 44–5). The diffusion of RR soybeans in the country was not an end in itself. Argentina was the ‘door’ Monsanto used to enter the Southern Cone seed market, as countries like Brazil and Paraguay followed Argentina’s leadership in the adoption of biotechnology and RR seeds were smuggled from Argentina into neighboring countries before their governments had authorized the cultivation of transgenic soybeans.

The fast dissemination of RR soybeans in Argentina was partially due to the expiration of Monsanto’s patent on the herbicide glyphosate in 1987 and to the lack of a patent on RR soybean seeds. The expiration of the patent on glyphosate allowed other companies to produce and sell the herbicide in competition with Monsanto. Chinese producers in particular started to supply the world with cheaper glyphosate, significantly affecting Monsanto’s profits in the herbicide business but making it more affordable for farmers. On 10 July 1990, Monsanto obtained a patent on ‘glyphosate-resistant plants’ in the US. However, only on 3 April 1995 did Monsanto apply for a revalidation of this patent in Argentina. This was either because the company miscalculated the commercial results that RR soybeans could have in the country or because they made a strategic decision to not apply for a patent earlier (Correa 2006: 1). At that point, the country’s patent legislation was being modified because of TRIPS, which raised controversies about the revalidation of foreign patents. The Argentine government argued that Monsanto had missed the deadline established in national and international law to apply for a patent in the country (a one-year period following the first application filed in the world) (Nellen-Stuck and Meienberg 2006: 2). It was also argued that at that moment the RR gene had already been released in Argentina and no longer matched the requisite of novelty necessary for the granting of a patent (Newell 2009: 44–5). On 24 October 2000, the Argentine Supreme Court issued a ruling on the case of Unilever vs. Argentina’s National Institute of Industrial Property rejecting the revalidation of foreign patents. Among those patents was Monsanto’s US patent on the RR gene (Correa 2010). The RR gene was therefore in the public domain.

In parallel to these disputes, the Argentine Association for Protection of Plant Varieties (*Asociación Argentina de Protección de las*

Obtenciones Vegetales – ARPOV) created the system of ‘extended royalties’ (*regalías extendidas*) in 1999. ARPOV is an organization founded in 1990 by (mostly transnational) seed companies for the defense of private IP on plant varieties. Its system of extended royalties is based on private contracts regulated by the Civil Code through which the rural producer agrees to pay royalties for saved seeds and to have his/her facilities inspected by ARPOV. The system of extended royalties was the first attempt in the Southern Cone to bypass public policy-making by instituting a private IP regime on seeds. It would become a major source of conflicts between seed companies and rural producers in the 2000s.

Thus, by the end of the 1990s, Argentina’s national IP regime on seeds was still based on the essential rights established in 1973 and the transgenic seed technology used in the country’s main crop was in the public domain. According to unofficial estimates, the use of illegal soybean seeds in Argentina at the turn of the decade ranged from 30 to 50 per cent of cultivated seeds (Rossi 2006: 12). The persistence of such a permissive regime was remarkable considering that Argentina was then a poster child for neoliberal reforms and had been under sanctions imposed by the US government because of alleged infringement of international IP standards. It was not by accident that the president of FAA, a large association of small rural producers founded in 1912, referred to the right to save seeds as ‘one of the few bastions that were saved from the neoliberal decade of the nineties...one of the last of Grandma’s jewels’ (Eduardo Buzzi, February 2005, in FAA (2005: 15), author’s translation).

The radicalization of conflicts over intellectual property on seeds in the demise of neoliberalism (2000s)

Defeated in the courts over a patent claim, unable to obtain royalties from the majority of rural producers and facing competition from Chinese suppliers of glyphosate, Monsanto launched a series of partially overlapping strategies to obtain financial compensation for the use of RR technology in Argentina:

- an anti-dumping case against imports of glyphosate from China to Argentina;
- lobbying for legal restrictions on the right to save seeds;

- the promotion of a private system of royalty collection;
- an international lawsuit started in Europe over the alleged infringement of IP rights in Argentina.

Not letting the profits go

In 2001, Monsanto appealed to the Argentine Committee on Foreign Trade accusing Chinese companies of selling glyphosate in Argentina at prices below production costs, a predatory business practice condemned in several countries and known as ‘dumping’. The Argentine government accepted the case, prompting Chinese companies, the Chinese embassy in Argentina and local importers of herbicides to cooperate in defense of the import of glyphosate from China. A Monsanto spokesperson stated that ‘a favorable outcome of the antidumping case will enable us to continue producing glyphosate in Argentina’ (ICIS.com, 04 February 2004). Since the 1980s, Monsanto had been producing glyphosate in a factory built in the locality of Zarate, province of Buenos Aires. According to the company, US\$137 million had been invested in that factory since 1998 (ICIS.com, 04 February 2004). For Monsanto, this investment – along with the jobs and tax revenues created by the factory – was a bargaining chip in the case against Chinese glyphosate. But the Argentine government thought otherwise.

In February 2004, Argentina’s Ministry of the Interior issued a resolution deciding not to levy an anti-dumping duty on Chinese glyphosate. At that moment, annual sales of glyphosate in Argentina amounted to around US\$250 million. Sales by Chinese producers corresponded to around a quarter of the local market, showing how much revenue Monsanto was losing with the increased penetration of Chinese companies in the Argentine market (People’s Daily, 06 February 2004). The ministry declared that the decision was in the ‘interest of society...because it protected the competitiveness of an industry vital to the development of the Argentine economy [soybean agriculture]’ (ICIS.com, 04 February 2004). In 2004, Argentina was just starting to recover from one of its most severe economic crises, caused by neoliberal policies implemented by President Menem and international financial crises that took place in the late 1990s (Rapoport 2006: 822–4). Data from the FAO and the United Nations Economic Commission for Latin America and the

Caribbean (ECLAC) indicate that at that point soybean agriculture accounted for around a fifth of Argentina's exports and was thus crucial for the country's recovery. Taxes levied on soybean exports, which eventually reached a rate of 35 per cent and caused a severe conflict between rural producers and the state, became an important source of funds for the economic and social policies implemented by President Néstor Kirchner (2003–7) and his successor and wife Cristina Fernandez de Kirchner (Richardson 2009). The Argentine state thus had a direct interest in guaranteeing that Argentine soy growers would keep benefiting from cheap, patent-free glyphosate and RR seeds. The government's decision not to levy taxes on Chinese glyphosate found support across the agricultural sector, which was interested not only in keeping production costs low but also in not antagonizing an important trade partner – China (Newell 2009: 42).

Regulating the right to save seeds

Monsanto was not the only company discontent with the Argentine IP regime on seeds. A marketing director of Pioneer in Argentina stated that 'In 2001–02 the country planted a million new hectares of soybeans. We [Pioneer] didn't sell one more bag of seed' (Goldsmith, Ramos and Steiger 2003: 25). Being a global leader in the seed industry, Monsanto joined other seed companies operating in Argentina to lobby for legal restrictions on the right to save seeds and for improvements in the enforcement of IP rights. The debates and conflicts that followed focused on soybean agriculture. As pointed out by Aldo Casella, IP expert working in collaboration with FAA, 'there is no doubt that the contestation over the right of rural producers to save seeds, with its consequences to legislative changes and demands for royalty payments, was born and intensified with the generalization of the use of transgenic varieties of soybeans' (Casella 2006: 1–2, author's translation). For the chief economist of the Argentine Rural Society (*Sociedad Rural Argentina* – SRA), a powerful association of large rural producers founded in 1866, 'even if Monsanto had the patent [on RR seeds] recognized in Argentina, the conflicts [over IP] would not be a lot different than they are today because it has not yet been decided which is the most efficient mechanism to restrict the right of rural producers to save seeds' (Ernesto Ambrosetti quoted on *Página/12*, 19 February 2006, author's translation).

Indeed, Argentina's new law of patents, approved in 1995, is uncertain in its application to plant varieties (Gutiérrez and Penna 2004: 8), especially the GM ones. The fact that the law of patents (stating IP rights on genes and biotechnological processes) and the law of seeds (stating plant breeders' rights on plant varieties) apply to the same concrete object (the seed) implies inconsistencies that have prevented the effective application of a double protection by both laws (Witthaus 2006). Argentina is a signatory of UPOV 1978, which forbids the double protection of plant varieties with patents and plant breeders' rights. To further complicate matters, the enforcement of plant breeders' rights had been impaired since 2000 because President Fernando de la Rúa (1999–2001) dissolved INASE in the midst of the profound economic crisis then affecting the country. The activities and resources of the institute were transferred to SAGPyA (Brieva et al. 2008: 14–5) and resulted in a loss of autonomy (interview with INASE, August 2010, Buenos Aires).

A first response from the state to the demands of seed companies came in July 2003. Given the inefficacy of INASE's Resolution 35 of 1996 and because authorities concluded that most pirate seeds were being stored inside farms mixed with legal seeds (Herrero 2006), SAGPyA issued Resolution 52 determining that, if required by authorities, rural producers must inform them within seven business days of the amounts and varieties of seeds cultivated or to be cultivated. Rural producers would also have to give proof of origin and acquisition of seeds. Failure to comply with these obligations would result in a fine and confiscation of illegal seeds. For FAA, the measure was a response to the interests of private seed companies and mistakenly assumed that the right to save seeds was the cause of seed piracy (FAA 2005: 34–5). The association argued that the high proportion of illegal seeds in the market was a product of:

- high prices for seeds in 1996/97;
- the dissolution of INASE;
- the maintenance of the value of seeds in dollars even after a sharp devaluation of the peso in 2002;
- the absence of the state 'in the generation of technology in plant varieties, which left as single actors in this strategic industry private companies, national and foreign' (FAA 2005: 34–5, author's translation).

The weak participation of the state in the provision of soybean seed technology was one of the main grounds behind the opposition of Argentine rural producers to restrictions on the right to save seeds. Until the 1980s, the seed industry in Argentina was balanced and diversified, with the presence of family-owned national seed companies, transnational corporations (working mainly with hybrid maize) and the National Institute of Agricultural and Livestock Technology (*Instituto Nacional de Tecnología Agropecuaria* – INTA). INTA is an agricultural R&D state agency created in 1956 that, until the late 1970s, was the main actor in the development of genetics applied to agriculture in Argentina (Rönner 2003: 17). The institute actively supported the expansion of soybean agriculture in the country. Systematic work in soybean plant breeding started in the 1960s, when INTA and a group of companies started experiments with cultivars from Brazil and the US (Brieva 2006: 229). Access to INTA's genetic material allowed a group of national companies to participate in the soybean seed market. Because soybeans are autogamous plants, transnational firms had a scarce interest in the development of new varieties. Only a few of them – such as Asgrow, Northrup King and Continental – commercialized soybean seeds (Brieva 2006: 231–2). INTA also performed an important role in technical assistance for rural producers that were starting to grow soybeans (Brieva 2006: 312).

This situation began to change in the late 1970s, when the effects of neoliberal globalization started to be felt in Argentina. Neoliberal policies implemented by the military dictatorship installed in 1976 and by the Menem administration in the 1990s involved a reduction in the size of the state and of state intervention in the economy. For INTA, this meant a reduction in budget, skilled personnel and research equipment (Gutiérrez and Penna 2004: 18; Linzer 2008: 712). In 1995, the institute lost financial autonomy and was severely debilitated with the elimination of taxes on exports. For years, a small share of those taxes had been assigned to INTA by law (Barsky and Gelman 2001: 375; Pengue 2001: 22).

Neoliberal policies that weakened INTA also facilitated the extension to Argentina of the process of concentration that was taking place in the world industry of agricultural inputs. The country's seed market – one of the biggest in the world and the second largest in Latin America – was very attractive for transnational companies (Chudnovsky 2005: 9). National seed companies were either

acquired by foreign companies or articulated their plant breeding programs with transnational companies via license agreements that allowed them to insert foreign transgenic technology into locally adapted varieties (Brieva 2006: 306; Newell 2009: 33). Monsanto, Dow Agro Science, DuPont, Syngenta, Bayer and BASF began to play an enormously significant role in the supply of the new technological package organized around GM seeds (Bisang and Varela 2006).

The participation of INTA in the provision of transgenic seeds was hindered by lack of resources and by problems in obtaining genes from the private sector (Gutiérrez and Penna 2004: 24) because Argentina's IP legislation displeased foreign companies (interview with INTA, August 2010, Buenos Aires). In 1993, INTA's Program for Advanced Biotechnology made explicit the institute's strategy of not competing with transnational companies and recommended the exploration of market niches not dominated by them (Brieva 2006: 248–9). From 1981 to 2006, only 7 per cent of new soybeans varieties registered at INASE belonged to INTA (Brieva 2006: 248), none of them transgenic. The participation of seeds with INTA's germplasm in the formal market for soybeans seeds fell from 4.4 to 0.3 per cent between 1995–1997 and 1999–2001 (Devoto and Picca 2003, no page, quoted in Gutiérrez and Penna 2004: 16).

The withdrawal of INTA from the soybean seed market implied a growing dependence of rural producers on private firms (especially transnationals), which raised their awareness about IP: 'Our organization [FAA] speaks of technological sovereignty. We speak of a technology that we can access without difficulties. For this reason we continuously encourage INTA to seriously participate in the generation and transfer of technology' (FAA 2005: 226, author's translation). FAA also expressed reservations about collaboration between INTA and transnational seed companies (interview with Aldo Casella, August 2010, Buenos Aires).

Under continuing pressure from the seed industry, SAGPyA started to present proposals for a new law of seeds at CONASE at the end of 2003 (Casella 2006). All proposals implied the adherence of Argentina to UPOV 1991 by restricting the right to save seeds according to different criteria. The proposals had important similarities with a bill drafted by a team of experts led by Miguel Rapela (former president of ASA and ARPOV), which was made public in October 2006.⁴

Outside CONASE, proposals for a new law had been under discussion since at least 2001. Two officials of FAA reported a meeting held by SAGPyA on 19 July of that year to discuss IP on seeds. Representatives of the four main associations of rural producers in Argentina participated: FAA, CRA, SRA and the Intercooperative Confederation of Agriculture and Livestock (*Confederación Intercooperativa Agropecuaria* – CONINAGRO). Founded in 1956, CONINAGRO is a nationwide association of cooperatives of medium and small rural producers. During the meeting, Jorge Solmi (FAA's IP specialist and later a legislator in the provincial Parliament of Buenos Aires) and Guillermo Giannasi (a director of FAA) criticized SAGPyA for sending letters to rural producers demanding proof of acquisition for seeds and for not having invited their associations to participate in the formulation of a new law of seeds (FAA 2005: 23–5). The letters were sent soon after ARPOV started to investigate rural producers, which made FAA and other agrarian organizations conclude that the actions of SAGPyA and ARPOV were concerted (FAA 2005: 23–5). FAA's officials also reported that during the meeting SAGPyA's authorities stated that the bill for a new law should define the concept of rural producers to determine who should be entitled to the right to save seeds. For SAGPyA, *pools de siembra* should not be entitled to save seeds without paying royalties (FAA 2005: 23–5).⁵

When the legislative proposals started to be openly discussed at CONASE, the administration of Néstor Kirchner had just re-established INASE as a decentralized and semi-independent organ with national jurisdiction. FAA (2005: 47–9) interpreted the measure as part of the Kirchner administration's commitment to the public interest and the restoration of the state. The law that recreated the institute – dated November 2003 – determined that its directory board would have representatives from all the parts involved in the seed market, including two representatives of rural producers. Thus, the corporatist links between the state and the private sector that had characterized INASE before its dissolution were maintained. FAA welcomed the re-establishment of INASE, regarding it as an accomplishment of the organization (FAA 2005: 47–49).

Around the same time, FAA also started a collaborative work with *Grupo Ateneo* – a study group of the National Technological University of Reconquista (*Universidad Tecnológica Nacional of Reconquista*) – to develop studies about the implications of agricultural biotechnology for rural producers (FAA 2005: 55,62). According

to FAA, the interaction between members of the organization and academics of the university was almost daily, with FAA providing them with insider information about negotiations around the proposals for a new law of seeds. The collaboration involved more than 15 meetings with producers and cooperatives in different parts of the country with the goal of clarifying the theme and knowing the perspective of FAA's membership. The organization regarded the collaboration as one of vital importance, enabling it to have a well-formulated analysis of IP in agriculture (FAA 2005: 62). The FAA was improving its mobilization around IP, now to incorporate 'organic intellectuals' to assist in negotiations with the state and in the articulation of a compelling public discourse.

The first proposal for a new law of seeds to be openly discussed at CONASE limited the area that rural producers could cultivate with saved seeds to the area sowed with the original seeds (Casella 2004, in FAA 2005: 106). The second proposal, according to engineer Silvia Fabbro, who represented FAA at CONASE, stated that rural producers would not need authorization from the owner of the cultivar to save seeds but set a maximum number of hectares that could be cultivated with saved seeds without royalty payments. Indeed, SAGPyA stated in a press release that Secretary of Agriculture Miguel Campos had the intention of changing regulations on IP to allow a limit of 65 hectares for free cultivation with saved seeds (Noticias de la SAGPyA, 25 January 2004). According to the FAA, the bill also determined that:

- the right to save seeds was restricted to 'rural producers' only, excluding pools de siembra (Casella 2004, in FAA 2005: 36–38);
- patents could not oppose or hinder the free exercise of the right to save seeds;
- the state had the prerogative of declaring the 'restricted public use' of a plant variety when necessary to ensure the adequate supply of the product obtained from the cultivar. This provision, which is similar to a compulsory license, was already in the original law of seeds but in the proposal it was restricted to situations when the cultivar owner could not supply the respective seeds at 'reasonable prices and amounts' (Casella 2004, in FAA 2005: 162–164);
- the court of the City of Buenos Aires would be the competent site to solve IP disputes between rural producers and cultivar owners (FAA 2005: 36–38).

FAA (2005: 36–38) expressed several objections to the bill. First, it argued that the limit on the number of hectares that could be cultivated with saved seeds without royalty payments virtually eliminated the right to save seeds and that such a quantitative restriction was absent in other countries. The organization cited Mexican and European legislation despite the scarce knowledge about foreign conflicts over IP on seeds that Argentine associations of rural producers have (interview with Aldo Casella, August 2010, Buenos Aires). Second, with that area limit even rural producers willing to pay royalties for saved seeds cultivated beyond the maximum area would not be allowed to do so. Third, the bill only suggested (but did not explicitly mention) that saved seeds would not be subject to royalty payments. Lastly, the appointment of the court of the City of Buenos Aires to solve related disputes indicated bias in favor of seed companies. FAA argued that this was an unconstitutional restriction on the right of rural producers to defend their rights judicially because most of them do not live in the city while most seed companies have headquarters there (FAA 2005: 36–8).

Furthermore, as reported by Casella (2004, in FAA 2005: 162–4), in both proposals there is a large list of acts on the part of rural producers that would require authorization from the cultivar owner, including acts typical of preparation and sowing that do not have the goal of commercializing seeds as reproductive material. In this regard, the proposals emulated parts of INASE's controversial Resolution 35 of 1996 (Casella 2004, in FAA 2005: 162–4). As part of his critique to the bill drafts, Casella (2006b: 4) also affirmed that the public interest in agriculture and food needs to be a guiding principle in changes to IP law so as to prevent the existence of monopolies that could threaten the freedom of rural producers and the continuity of production. References to the public interest, to national sovereignty and to the centrality of agriculture for the economy in Argentina started to appear often in FAA's discourse, characterizing an attempt to link the demands of rural producers to the national interest and to mobilize public opinion and the state.

In March 2004, FAA published in its newspaper (*La Tierra*) an article stating that the Ministry of Foreign Affairs of Argentina had promised to include in its diplomatic agenda the adherence of the country to UPOV 1991 through a new law of seeds (FAA 2005: 63). In the

same edition of *La Tierra*, it was stated that FAA, SRA, CRA and CONINAGRO had agreed to defend the right of rural producers to save seeds and to fight the lobby of ARPOV. The four associations of rural producers were increasingly coordinating their actions in the politics of IP. A magazine published by CONINAGRO reported a series of meetings held by the four organizations in 2004 to discuss the proposals for a new law of seeds. The final meeting, referred to as *Encuentro de Pilar*, did not produce a consensus but there were some agreements, for instance regarding the system that should be applied to monitor the seed market (CONINAGRO 2010: 30).

For FAA the position taken by the four associations was relevant because it was expressed by 'the totality of the corporate representation of the most important sector of the national economy', which 'will have to be taken into account by the government because it comes from the sector that in the previous year provided tax revenues of 9,200 million pesos just in the form of export taxes' (FAA 2005: 63, author's translation). Associations of rural producers would recurrently raise the dependence of the state and the economy in Argentina on soybean agriculture to mobilize the government to defend their interests.

While discussions about a new law of seeds were taking place, INASE issued new regulations with the goal of reducing seed piracy. In May 2004, the institute issued Resolution 44, requiring that each bag of seed be labeled with quantity, unit price, sales value and seed variety (Yakelevich 2009: 10). Going in the opposite direction of a strengthening of IP in agriculture (and as an indication of the state's ambiguity on the issue), in September 2004 Carmen Gianni (INASE's legal director) stated in the institute's monthly bulletin that 'to protect agriculture with a system of patents implies the creation of strong monopolies in a field vital for our country, restricting the freedom of research and development of new plant varieties to a private decision and radically eliminating the right of the rural producer to save seeds for his own use; reasons why patents should be excluded from application to plants in general' (Gianni 2004: 2, author's translation). Her statement indicates that, at least for some state officials, the centrality of agriculture to the economy in Argentina was a reason *not* to strengthen private IP rights on seeds.

In 2005, probably in reaction to attempts by some government authorities to limit the right to save seeds, Senators Ricardo Taffarel,

Juan Marino and Ernesto Sanz (*Unión Cívica Radical*) presented a bill at Congress reaffirming the right to save seeds and specifically stating that saved seeds may be stored in or outside the rural producer's own facilities and without restrictions that could hinder or make more costly the exercise of that right (Taffarel, Marino and Sanz 2005). In the justification attached to the legislation, they mentioned the works of Aldo Casella (the IP expert working with FAA), Carlos Correa (an IP expert who would later assist the Argentine state in disputes with Monsanto) and José Carlos Basaldúa (head of CRA's grain committee). The references to these names demonstrate the responsiveness of congressmen to the discourse and demands of associations of rural producers. An exception was Representative Julio Martínez (*Unión Cívica Radical*), who in September 2007 presented a bill for the ratification of UPOV 1991 by Argentina (Martínez 2007). The proposal was not approved.

Discussions about a new law of seeds persisted in the following years. In August 2009, the Argentine Chamber of Seed Multipliers (*Cámara Argentina de Semilleros Multiplicadores* – CASEM) presented to congressmen its own legislative proposal. CASEM was created in 1992 by companies that multiply plant varieties developed by seed companies or other breeding organizations and sell them to rural producers or retailers; it was a reaction of this segment of the commodity chain to alleged abuses on the part of seed companies in the charge of royalties. In the proposal, CASEM rejected ARPOV's system of extended royalties but limited the area that rural producers could plant with saved seeds without paying royalties to the area originally cultivated with certified seeds. In the second article of the proposal, seeds were declared a resource of 'national interest'. In the justification attached to the bill, CASEM stated that 'the seed is the first segment of the primary production and of the agri-food chain . . . representing for Argentina what oil means for a country like Saudi Arabia' (CASEM 2009: 1, author's translation). Once more, the central role of soybean agriculture in the political economy of Argentina was used by an organization opposing seed companies. The fact that CASEM presented a whole legislative project of its own also demonstrated how articulate the organization was in IP matters.

As the end of the decade approached, the positions taken by the actors involved in the debates were increasingly influenced by transnational competition between rural producers and governments

from South America for foreign markets and technology. In September 2007, Monsanto had announced the investment of US\$28 million in research in Brazil for the development of a new transgenic variety of soybeans that would be resistant to *Anticarsia gemmatalis*, an insect that attacks the plant in South America (Folha OnLine, 05 September 2007). In the new variety (RRBt soybeans from now on), genes from a bacterium that produces substances with insecticidal properties (*Bacillus thuringiensis*) are stacked on the RR genetic elements. The new technology is expected to increase yields by 7–11 per cent (Correio do Povo, 27 August 2008). Rural producers that do not adopt RRBt soybeans will become less competitive than those using the new variety. Monsanto purposefully used this situation to its advantage. In a press release of 9 April 2010, the company asserted that:

Although Monsanto has obtained patents that protect the new biotechnological events [RRBt soybeans], the date of release in Argentina is still uncertain since the country does not have an efficient system for recognition of IP... Distinct is the situation in Brazil and Paraguay, since in both countries there is an efficient system for the recognition of IP... In Brazil and Paraguay, it is expected that this technology will be released in 2011.

(Monsanto, 09 April 2010, author's translation)

Besides the risk of Argentine soy growers not having access to Monsanto's new technology, associations of rural producers and government authorities in Argentina faced two other concerns: from 2009 to 2010, Brazil had surpassed the country both in number of transgenic plant varieties approved by the state for cultivation and in area sowed with transgenic crops. These transnational competitive pressures made associations of rural producers and government authorities more inclined to support regulations that strengthened private IP rights on seeds.

In September 2010, Secretary of Agriculture Lorenzo Basso stated that the government had finished the bill for a new law of seeds, which should soon be submitted to the Congress with the explicit goal of ensuring that the RRBt technology is released at the same time in Argentina and Brazil (Cadena 3, 12 September 2010). In one of the 2010 editions of its institutional magazine, CONINAGRO stated that 'the right to save seeds with practically no restrictions other

than the rural producer having bought the original seeds legally will have to be eventually re-considered', 'a system that allows the access, incorporation, diffusion and the correct use of new biotechnological developments...*is needed to keep the competitiveness of Argentina in the world market*' (CONINAGRO 2010: 28–30, author's translation, emphasis added).

Even the organization that had fiercely defended farmers' rights appeared to have become more flexible on the issue. During a national seminar about agricultural biotechnology, promoted by FAA, in Buenos Aires in August 2010 (*Jornada Biotecnología Agraria y Desarrollo Nacional*), the president of the organization, Eduardo Buzzi, stated that 'the right to save seeds should be kept for small and medium rural producers, other producers who have capacity to pay might pay, and this should be contemplated in the new law' (personal observation by the author, August 2010, Buenos Aires). Still, the seminar showed how FAA's mobilization around IP had developed. Among those present were representatives from FAA and CASEM, IP experts such as Aldo Casella, Carlos Correa and Salvador Bergel, a number of congressmen, officials of INTA and the minister of agriculture, Julián Domínguez. In his speech, Eduardo Buzzi stated that the small rural producer is part of Argentina's national identity and that although technological innovations are important they should not be above the national interest (personal observation, August 2010, Buenos Aires). Once more, the organization was framing its demands in terms of the national interest.

By 2012 the Ministry of Agriculture, Livestock and Fishery was still holding meetings at CONASE with representatives from ASA, ARPOV, the four main associations of rural producers and other organizations in search of a consensus around a new law of seeds (Clarín, 03 November 2012). After the government authorized the cultivation of RRBt soybeans following its biosafety regulations in August 2012, the debate over IP gained momentum. For the seed industry it meant that Argentina was starting to recover its competitive position in relation to Brazil. Rodolfo Rossi – a plant breeder at Nidera – said that 'from the point of view of authorizations [for transgenic varieties] we have recovered in relation to Brazil, but not in the research and development of new varieties' (*La Nación*, 25 August 2012, author's translation). As pointed out by *La Nación* – one of Argentina's largest newspapers – Brazil had been ahead not only in the authorization

and cultivation of transgenic crops but also in R&D as exemplified by the development of another transgenic variety of soybeans by EMBRAPA, the Brazilian state-owned agricultural R&D corporation (La Nación, 25 August 2012). The gap remained also in the protection for IP. In the words of Manuel Mihura, director of Argentine seed company Don Mario, 'in Argentina there is very low recognition of the intellectual property on soybean germplasm, covering only around 35–7 per cent of seeds. In Brazil, certified seeds correspond to around 80 per cent of sowed seeds' (La Nación, 25 August 2012, author's translation).

Associations of rural producers interpreted the authorization of RRBt soybeans as a sign that the submission to the Parliament of the proposal for a new law of seeds was imminent. FAA accused Minister of Agriculture Norberto Yauhar of promoting a new law of seeds that surrendered national sovereignty in favor of Monsanto, pulverized the right to save seeds and consolidated the oligopolization of the seed industry (La Capital.com.ar, 18 September 2012). In its latest version, the bill restricted the right to save seeds without royalty payments only to family agriculture (La Nación, 29 September 2012).

On the part of SRA, it was held that royalties paid over saved seeds should compensate at once for patents and plant breeder's rights (La Nación, 29 September 2012) and should be charged only after five years of saving seeds reproduced from the original ones (Reuters, 21 December 2012). For CRA, the right to save seeds should remain as in the original law, free for all rural producers (La Nación, 29 September 2012) or at least for the first three years of saving seeds (Reuters, 21 December 2012). CARBAP – one of the main provincial associations of CRA – issued a press release stating that the bill annihilated a series of essential rights of rural producers and that the organization would call for the other associations to collectively defend their rights (CARBAP 2012).

Even within the government divisions persisted. Interviewed by a news agency, Under-Secretary of Family Agriculture Emilio Pésico said that a new law of seeds was not on the government agenda (Reuters, 21 December 2012). In the Parliament, 12 congressmen (Barchetta, Orsolini – a former vice-president of FAA, Zabala, Cuccovillo, Rasino, Comi, Riestra, Stolbizer, Peralta, Cardelli, Argumedo and Vanilloto) proposed an alternative bill sponsored by

FAA in which the right to save seeds is not curtailed (Peremulter 2012). By blocking a consensus within CONASE and mobilizing links with legislators, associations of rural producers have delayed the submission of the bill formulated by the executive to the National Congress.

The actions taken by associations of rural producers also demonstrated the importance of the role of the state in the provision of technology to IP negotiations. CONINAGRO stated that

if we arrive at an agreement between rural producers and seed companies giving up a millenary right, the commitment of the seed industry to investment in technology needs to be assured. It is not acceptable to approve new varieties that have only cosmetic changes. It is also not acceptable to just import and adapt varieties developed abroad.

(CONINAGRO 2010: 28–9, author's translation)

For the organization, in order to achieve a consensus on a new law of seeds the RR gene should be licensed by Monsanto to INTA and universities. In this case, if new legislation becomes effective, rural producers would still have a cheap alternative to new technology protected by IP rights (interview with CONINAGRO, Buenos Aires, August 2010).

State officials seemed to share the concerns of CONINAGRO. In September 2008, Congresswoman Ivana Bianchi (*Partido Justicialista*) presented to the executive power a request for information about alleged negotiations with Monsanto to change the country's legislation so that RRBt soybeans can be released in Argentina (Bianchi 2008). In the request, she reported that the government would be willing to alter the legislation if Monsanto agreed to invest US\$125 million in the country over four years, integrating national companies in its research program and transferring technology to INTA (Bianchi 2008). At the end of the same year, Congressmen Carlos Raimundi, Lidia Naim, Veronica Benas and Nelida Belous presented a bill in the Parliament creating the National Fund for Biotechnological Sovereignty (Raimundi et al. 2008). The fund would promote technological sovereignty and the adaptation of biotechnologies to the national context with stronger participation of the state as a developer and supplier of biotechnology (Raimundi et al. 2008). The legislators referred to 'increasingly restrictive'

international IP laws that had been associated with the 'high level of technological dependence' on the part of Argentina (Raimundi et al. 2008, author's translation). These statements and proposals show that, given the high level of oligopolization of the seed industry, legislative reforms that further increased the control of seed technology by transnational companies would be acceptable by the state and rural producers only if accompanied by a strengthening of national capacities in agricultural R&D.

As of 2013, there is no sign of INTA having presented a proposal of its own in spite of its formal participation in CONASE. In the 1970s, representatives of the institute participated in the committees that designed the law of seeds and its regulatory decree. The final draft of the law was substantially based on the input provided by them (Gutiérrez 1994: 12–16). At the present times, according to INTA's direction of technological linkage, the participation of the institute at CONASE is 'only technical, not political' (interview, Buenos Aires, August 2010), suggesting that the withdrawal of INTA from the soybean seed market was accompanied by a retraction of its participation in IP rule-making. This has happened in spite of the institute's improved financial situation due to the country's economic recovery (Linzer 2008: 715) and the restoration of its financial autonomy in 2002. In that year, the state enacted a law determining that the equivalent to 0.5 per cent of the value of imports (cost, insurance and freight) must be assigned to INTA's budget annually.

The endurance of the 1973 law of seeds has been celebrated by FAA as an accomplishment of the organization (interview with Aldo Casella, Buenos Aires, August 2010). Even ASA and ARPOV acknowledged that FAA's 'very politicized and active' mobilization had prevented the emergence of a new law of seeds for over a decade (interview with ASA and ARPOV, Buenos Aires, August 2010).

A private intellectual property regime

While the resistance of rural associations and some government authorities hindered the reform of Argentina's national IP regime on seeds, private seed companies were building private IP regimes involving regulations and enforcement practices that Monsanto was trying to extend transnationally.

One such regime was the system of extended royalties created by ARPOV. Monsanto is one of the participating companies. Since 1999, through licensees such as Nidera, the corporation received US\$2 per

50kg bag of seeds saved by rural producers that had signed contracts of extended royalties (Teubal 2008: 17). These contracts include a clause that authorizes ARPOV to inspect farms to verify the absence of illegal reproduction, use and commercialization of seeds (Brieva et al. 2008: 19). For associations of rural producers, the system has no legal legitimacy because it is based on private contracts. While ARPOV claims the contracts are supported by Articles 1144, 1145 and 1146 of the Civil Code, its critics say that the right to save seeds (and the law of seeds in its entirety) is of public nature and therefore cannot be renounced by an individual rural producer through a private contract.

In response to the discontent of rural producers, in June 2002 Congressmen Melchor Posse, Héctor Romero and Sarah Picazo presented a bill suspending for 180 days the efficacy of contracts of extended royalties (Posse, Romero and Picazo 2002). In September 2003, FAA's branch in the city of Pergamino sent a letter to SAGPyA inquiring about the legality of the system. Oscar Costamagna, SAGPyA's chief officer for control of the seed market, replied that the organ 'absolutely does not validate' the system of extended royalties because it 'goes beyond the rules of the law of seeds and lacks legal support' (FAA 2005: 39–41, author's translation). This statement came only two months after the enactment of INASE's Resolution 52, which established stricter controls for the seed market, indicating the persistence of ambiguity in the executive power in the conflict between seed companies and rural producers. This hesitation had been contributing to keeping the Argentine IP regime on seeds essentially unaltered.

Having received the response from SAGPyA, FAA started to provide legal assistance to rural producers who were being addressed by ARPOV about royalty payments and whose facilities were being inspected. FAA's directive on this issue was published in its own newspaper and website (FAA 2005: 39–41). On 27 October 2003, FAA's committee on seeds met at the organization's headquarters in Rosario to approve a document attacking the influence of seed companies on the government and the system of extended royalties (FAA 2005: 176). The organization also raised the example of Uruguay to contest ARPOV. As Argentina, this country is a signatory of UPOV 1978 and its National Seed Institute officially declared null agreements for extended royalties existent in that country. FAA's declaration was

widely distributed to the local media. The resistance of rural producers was developing to involve the mobilization of the media, the articulation of a clear public discourse and legal assistance to rural producers in IP matters.

In December 2003, Senator Mírian Curletti (*Unión Cívica Radical*) presented a project of communication (*proyecto de comunicación*) at the National Congress demanding that the executive power oppose the system of extended royalties (Curletti 2003). In the justification attached to the legislation, Curletti referred to a note signed by CONINAGRO, CRA, FAA and SRA opposing 'intimidatory' inspections of farms carried out by seed companies participating in the system (Curletti 2003). The note demonstrates once more the increasing coordination of the four organizations in the politics of IP and their capacity to mobilize members of the Parliament.

Going in the opposite direction, ARPOV and ASA defended the incorporation of the principle of extended royalties into the law of seeds and the principle that only small rural producers should be exempted (a condition that would admittedly exclude the large majority of soy growers from the right to cultivate saved seeds at no charge) (Núñez 2006: 10). In addition, according to Aldo Casella (interview, August 2010, Buenos Aires), ARPOV tried to reach a consensus with seed multipliers (companies that multiply seeds provided by seed companies in order to sell to rural producers) and seed distributors on a protocol for the commercialization and production of seeds that would integrate them into the system of extended royalties. This was not accomplished but distributors and multipliers have been pressured to provide assurance that rural producers acquire seeds through the system and to inform seed companies of their operations (interview with Aldo Casella, August 2010, Buenos Aires).

According to ARPOV, the coverage of the system has increased to include many of the new varieties released in the market. An official of CONINAGRO, however, stated that it is unlikely that rural producers under the system fully respect its rules (interview, Buenos Aires, August 2010). Moreover, as Aldo Casella pointed out (interview, August 2010, Buenos Aires), ARPOV never tried to enforce the contracts judicially in spite of the fact that many producers do not respect them. He also stated that seed companies have had to offer discounts to encourage rural producers to participate in the system. Soy growers that eventually decide to join the system are usually able

to negotiate and obtain discounts on the value of royalties originally demanded by seed companies (interview with Aldo Casella, August 2010, Buenos Aires). Therefore, the efficacy of the system has been limited.

Another private IP regime on seeds was proposed in 2004 by Secretary of Agriculture Miguel Campos under the name of global royalties (*regalías globales*). In reality, it was a mechanism of royalty collection that turned the state into a revenue agent for private seed companies. In January 2004, Monsanto announced its withdrawal from the soy business in Argentina in retaliation to the country's permissive IP regime. The sale of RR seeds by the company and its country-specific research program were interrupted. In response to that (Nellen-Stucky and Meienber 2006: 3–4), and given the lack of consensus around a new law of seeds (FAA 2005: 39–40), SAGPyA proposed the creation of a system of global royalties applicable to soybean and wheat. The proposal was initially presented as an individual piece of legislation but later was merged with the existing proposals to change the law of seeds (Casella 2004, in FAA 2005: 147).

In the new system, a fee ranging from 0.35 to 0.95 per cent of the sale price of soybeans and wheat would be charged from rural producers when they sold their harvests. The resulting amounts would be deposited in the *Banco de la Nación Argentina* to constitute the Fund for Technological Compensation and Incentive to the Production of Seeds (*Fondo Fiduciario de Compensación Tecnológica y Incentivo a la Producción de Semillas*). The fund would be used to compensate seed companies for their IP rights. The distribution of resources to seed companies would be made according to the area cultivated with each seed variety and to its performance, quality and technological complexity. Rural producers that proved to have legally purchased the seeds would be reimbursed with resources from the fund. A maximum of 5 per cent of the fund resources would be used to finance national research in areas or species of interest to the country. The system would be managed by INASE, which would receive 0.3 per cent of the fund's revenue (Casella 2004, in FAA 2005: 160–1).

The project was initially well received by seed companies. ASA had accepted that under the new system small rural producers would keep the right to save seeds at no charge (Clarín, 22 November 2004). Later, however, the organization criticized the proposal because of fear of mismanagement of the fund by the state (personal communication

with ARPOV quoted in Brieva et al. 2008: 15). ARPOV and ASA also figured it would be difficult to operationalize the division of resources among seed companies (interview with ASA and ARPOV, August 2010, Buenos Aires). The proposal did not satisfy Monsanto, which wanted soy growers to pay royalties in the form of a percentage of the value of each ton of exported soybeans (Palucito 2007: 6), the method it was about to apply in Brazil and Paraguay.

On the other side of the dispute, 'Leftist NGOs denounced the proposal as a masked "rural producer tax" in favour of Monsanto' (Nellen-Stucky and Meienber 2006: 3–4), a rare instance in which NGOs were seen defending soy growers. Rural producers' organizations were initially divided over the project. CONINAGRO, SRA and CRA had accepted the proposal but disagreed on the value to be charged from rural producers (Clarín, 22 November 2004). FAA opposed the proposal in its entirety, saying 'global royalties' were 'another tax' to be paid by rural producers (the term 'another' used specifically in reference to export taxes) (FAA 2005: 66). In general, rural producers regarded global royalties as 'another mechanism designed to curtail their rights to save seeds' (Nellen-Stucky and Meienber 2006: 3–4). Some of them feared that the system was only a first step toward further reforms to the Argentine IP regime (Casella 2004, in FAA 2005: 108). Opposition appeared even within the state, when the Office of State Revenues rejected the project on the grounds that this 'new tax' would hamper the development of Argentina's agricultural production for years (Nellen-Stucky and Meienber 2006: 3–4).

The taxation of agricultural exports was an important aspect of the relationship between the state and soy growers in shaping the Argentine IP regime. After export taxes were re-established in the early 2000s and attempts to charge royalties on RR soybeans started, rural producers tended to interpret royalties as another tax on their income: 'they just started to charge retentions [export taxes] and now they want to take even more from us' (interview with CONINAGRO, Buenos Aires, August 2010). The same source went further affirming that the Argentine rural producer was not in the same position as the American rural producer: 'if we received the subsidies they do... we could pay the royalties they want. Here we fund the government, there it's the opposite' (interview with CONINAGRO, Buenos Aires, August 2010). To a large extent, the conflict over IP on seeds was a

distributive one in which local rural producers, the state and seed companies were trying to appropriate a larger chunk of the surplus generated in the soy commodity chain.

In March 2004, 12 congressmen signed a project of resolution (*proyecto de resolución*) asking the Parliament to declare its rejection of the proposal for global royalties. In their justification for the project, the congressmen stated that the proposed system would turn the state into an agency for the collection of royalties for transnational companies and that, instead, it should promote public R&D to preserve its sovereignty (García et al. 2004). Analogously, Jorge Ugolini, vice-president of CRA in the province of Santa Fé, argued that global royalties were a 'new tax' under creation and that instead of presenting 'proposals that contradict the laws in effect, the state should preserve its sovereignty by promoting these activities [R&D of seed technology] in its own research agencies' (Ugolini 2004, author's translation). These statements show the connection between IP disputes and the role of the state in the provision of technology. They also demonstrate that some members of the Parliament and other rural associations were reproducing the rhetorical link made by FAA between the interests of rural producers and Argentina's national sovereignty.

In the June 2004 edition of *La Tierra*, FAA stated that a 'conclave' of agrarian leaders, rural producers and state officials from the province of Cordoba produced a 'homogeneous rejection' of global royalties (FAA 2005: 66). According to them, the proposal went against the 'sovereignty of the rural producer' and responded to the interests of transnational seed companies, Monsanto especially (FAA 2005: 66). The 'conclave' had representatives from FAA, SRA and CONINAGRO and was supported by Senator Roberto Urquía and Representatives Eduardo Carcía, Fernando Montoya and Raúl Merino (FAA 2005: 66). *La Tierra* also mentioned the intention of rural leaders to meet with the presidents of the National Congress' committees on agriculture in Buenos Aires to lobby for their interests. In fact, on 7 October, Senator Ramón Saadi presented a resolution project according to which the Congress would reassert the right to save seeds and demand that SAGPyA abstain from creating mechanisms for royalty collection on transgenic seeds that were not patented in Argentina (Saadi 2004). The meeting in Cordoba demonstrated once more the growing coordination between the main agrarian

organizations in the politics of IP. Rejected by most actors, the proposal for global royalties did not advance and was never formally submitted to the Congress (Palucito 2007: 6).

Given the failed patent claim on RR soybeans, the limited operation of the system of extended royalties, the rejection of the project for global royalties and the stagnant reform to the law of seeds, early in 2011 Monsanto started to build a private IP regime specific to the new RRBt varieties. In a public statement on 26 April 2011, FAA stated that Monsanto was firming contracts with rural producers that wanted to have access to the new transgenic varieties. The contract established a private system for royalty collection under the following rules:

- rural producers must acquire RRBt seeds only through Monsanto's system;
- rural producers must market harvests of RRBt soybeans only through trading houses and crushing industries that participate in the system;
- the areas cultivated with RRBt soybeans must be geo-monitored by rural producers along with Monsanto;
- rural producers have the option of paying royalties at the purchase of seeds or when selling harvests to participant trading houses and crushing industries, which would charge royalties and later transfer them to Monsanto;
- the courts of the city of Buenos Aires are appointed for the resolution of disputes that might arise (FAA 2011).

This was the system that Monsanto had already demanded for RR soybeans when it rejected the proposal for global royalties and, as we shall see, it is a transnational extension of the system the corporation had already implemented in Brazil and Paraguay for RR soybeans.

The rules implied that rural producers would have to pay royalties on saved seeds. If the rural producer opts to pay royalties only at the moment of sale of harvests, he will have a fee charged in proportion to the total value of the harvest no matter if it originated from saved or purchased seeds. If paying royalties at the purchase of seeds, the soy grower will be exempted from paying royalties when selling the harvest as long as the harvest is proportional to the seeds originally purchased. If the amount harvested ends up being higher than that, it

would be assumed that the producer had cultivated saved seeds and, therefore, should pay an additional amount at the moment of sale of the harvest. For FAA, this was a frontal infringement of the law of seeds (FAA 2011).

By determining that rural producers must buy seeds from the same sources and sell the harvests to the same trading houses and crushing industries, the system also forced rural producers into a commodity chain tightly controlled by foreign oligopolies. Moreover, the appointment of the courts of the city of Buenos Aires to solve disputes favored transnational seed companies, which have headquarters in the capital, and undermined the position of rural producers, who often live in the countryside. In an official note published on 10 May 2011, CASEM described the contracts proposed by Monsanto as coercive, discriminatory and illegal (CASEM 2011).

Monsanto also approached rural producers individually, starting with those in the northwestern region of the country where RRBt varieties can be particularly productive (La Nación, 20 August 2011). Contracts were always firmed under the condition of a huge asymmetry of power between a large transnational company and individual rural producers. As this and other instances will show, Monsanto always promoted negotiations in which it was the biggest player: it preferred negotiating with individual rural producers than with their associations, with associations from individual regions than with national federations, with representatives of a single country than with an international regional body.

Monsanto vs. Argentina . . . in Europe

The refusal of the Argentine state to grant Monsanto a patent on RR soybeans, the contentious operation of the system of extended royalties, the turndown of the project for global royalties and the absence of a consensus on a new law of seeds were not enough for Monsanto to give up on RR soybeans and simply shift to protecting new technologies. It went as far as Europe in a last attempt to charge royalties on RR soybean products.

In the middle of 2004, the corporation started to threaten Argentine soy growers and public authorities with taking legal action in countries that imported soybean products from Argentina and recognized patents on the RR seed technology. Monsanto warned that refusal to pay royalties on RR soybeans could imply the retention of

Argentine soybean products at their points of destination. FAA was quick to claim that Monsanto's intended actions were illegal and in violation of international treaties signed by Argentina (FAA 2005: 195–6). In a public statement dated 8 September 2004, FAA stated that the conflict between Monsanto and soy growers was a matter of state because it affected strategic issues such as the country's food security and the inflow of foreign currency to Argentina (FAA 2005: 203–4). The organization was broadening the context of the dispute to enlarge its base of support and prompt a reaction by the government. Once more, the centrality of soybean agriculture to the economy was used by rural producers to obtain support for their IP claims.

In November 2004, representatives of the four rural associations and ASA held a few meetings to discuss IP on seeds (FAA 2005: 67). They were able to agree on certain points of legislative reform, among which was the preference for payment of royalties at the moment of purchase of seeds by rural producers as opposed to at the time of sale of harvests (Clarín, 27 November 2004). However, on 29 November, just a few days after the last meeting and contrary to the preliminary agreement reached by rural producers and ASA, Monsanto sent a letter to the exporters' center in Buenos Aires (*Centro de Exportadores*) informing them that it would soon require a license for the exportation of grains containing the RR technology (FAA 2005: 219). In the letter, reproduced on FAA's publication, the company formally required exporters to sign a license contract establishing a royalty fee of 3 per cent on output with a discount of 1 per cent in the first year and later varying in accordance with the price of soybeans (FAA 2005: 219). The rules were very similar to those of a preliminary agreement that, as we shall see, had just been reached between Monsanto and Paraguayan agribusiness organizations.

In the following month, the company sent a letter to 20,000 rural producers restating its decision to implement a system of royalty collection justified by IP rights recognized in importing countries. The letter also mentioned that the system would come into effect on 1 May 2005 (FAA 2005: 222–4). The company's intention to set the royalty fee in relative terms – varying according to the price of soybeans – suggests an interest in appropriating part of the extraordinary rent that had been accruing to rural producers and the Argentine

state (through taxes) in the context of a boom in global commodity prices caused by growing demand from China.

On 14 December, Secretary of Agriculture Miguel Campos met with rural producers' organizations, seed companies and representatives of Monsanto in an attempt to solve the controversy (Clarín, 18 December 2004). CRA, ARPOV, ASA and some national seed companies (Relmó, La Tijereta, Producers and Buck) agreed that royalties should be paid only at the moment of purchase of seeds and included in their price. They also agreed on a rule to restrict the right to save seeds, setting a limit beyond which the use of saved seeds would require royalty payments. FAA, CONINAGRO, SRA and Monsanto did not sign the agreement (Clarín, 18 December 2004). In the document justifying its opposition, FAA criticized restrictions on the right to save seeds and recommended the emulation of a Brazilian law that prohibited the use of the 'terminator technology', a biotechnological method patented by Monsanto that creates sterile seeds as way to prevent rural producers from saving them (FAA 2005: 213–4).⁶

On the day of the meeting, SRA issued a public document presenting its position on the matter. The organization proposed that:

- an IP regime on seeds should stimulate free competition in the seed market and promote the entry of new actors in the seed industry;
- royalties should be paid at the moment of purchase of seeds and not with 'retentions' discounted from the value of the harvests;
- rural producers should have the right to cultivate saved seeds at no charge on 10 per cent of the total cultivated area, with a minimum non-chargeable base of ten tons of seeds, encompassing all producers;
- royalties could be charged for six years after the plant variety was registered at INASE, declining in value year after year. After that, the varieties would enter the public domain;
- since its proposal would amplify the base on which royalties would be charged comparatively to the current situation, the value of royalties under the new system should be inferior to those currently practiced (SRA, 14 December 2004).

SRA's position demonstrated that the oligopolization of the seed industry (associated with the decline of INTA) had increased the

resistance of rural producers against royalty payments. Now even the most conservative and elitist of the Argentine rural organizations had a strong stance in IP matters. The proposal for limiting royalty payments to only six years was quite radical since even the most permissive version of the UPOV convention (that of 1978) sets a minimum duration of 15 years for plant breeder's rights. SRA's statement also showed once more that rural producers tended to understand royalty payments charged on their output as another tax, using for royalties the same term used to refer to export taxes (*retenciones*).

On 23 December, FAA issued a press release accusing Monsanto of threatening national sovereignty and stating that the company's actions were aggravating the economic condition of rural producers, which was already jeopardized by export taxes that had been recently increased (FAA 2005: 222–224). Again, export taxes were connected to the issue of royalty payments. Other organizations joined FAA in open criticism to Monsanto. CONINAGRO accused the transnational corporation of trying to turn rural producers into vassals (Clarín, 31 December 2004). SRA affirmed that the corporation was trying to illegally extract around 100 million dollars from Argentine rural producers (Clarín, 31 December 2004).

In April 2005, the Argentine state tried in vain to mobilize its partners in the MERCOSUR (the Southern Common Market) against Monsanto. After a meeting of the bloc's council of ministers of agriculture held in Cartagena (Colombia), Secretary Miguel Campos declared that the ministers had agreed that royalties should be paid on seeds only at their purchase and not on sold harvests (Agência Rural, 05 April 2005). On 29 April, upon the conclusion of the subsequent meeting of the council in Asunción (Paraguay), the ministers issued a public statement affirming that, in accordance with UPOV 1978, royalties should be paid only on the purchase of seeds and not charged on the output sold by rural producers (MERCOSUR, 2005). After the declaration was made, however, no concrete action was taken by the Brazilian and Paraguayan states against Monsanto. In fact, a few days before the Asunción meeting, the Vice-Secretary for International Relations of the Brazilian Ministry of Agriculture (Lino Cólsera) had already declared that 'the proposal [made by the Argentine secretary for concerted action] needs to be analyzed in each country, taking into account the legal aspects of each one of them. The Brazilian government believes that royalties should be paid'

(Agência Rural, 05 April 2005, author's translation). Intense pressure led the governments of Brazil and Paraguay to retract their positions on the basis that organizations in the private sector in those countries were consolidating agreements with Monsanto (Newell 2009: 43). Official Argentine sources assumed that aggressive lobbying by Monsanto on the Brazilian and Paraguayan governments, which were concerned with not harming their own bargaining position by declaring support to Argentina, was behind this turnabout (Newell 2009: 43). Indeed, at that point, rural associations from Brazil and Paraguay were firming agreements with Monsanto submitting to the mechanism of royalty collection proposed by the company. This happened in spite of a declaration made by the Federation of Rural Associations of MERCOSUR (*Federación de Asociaciones Rurales del MERCOSUR*) in support of the collection of royalties only on the purchase of seeds (El Diario de Paraná, 02 April 2005), showing how limited the capacity of this organization was to create transnational cooperation between soy growers.

These were not the only failed attempts to create an effective transnational coalition against Monsanto. Earlier in 2005 the president of FAA had travelled to Germany, invited by Greenpeace to talk about the conflicts between Argentine rural producers and the corporation (La Nación, 30 March 2005). In spite of their meeting, no transnational mobilization of NGOs, social movements and soy growers emerged on the issue of IP in agriculture.

At the end of June 2005, Monsanto took a dramatic measure that changed the course and tone of negotiations over IP. After several threats, the company finally filed several lawsuits against importers of Argentine soybean products in the Netherlands and in Denmark, accusing 'the Dutch firm Cefetra, the Danish company Danish Lokale Andel as well as the American global company Cargill of illegally importing from Argentina genetically modified Roundup Ready soy...owned by Monsanto' (Nellen-Stucky and Meienber 2006: 1). Ships loaded with soybean crush coming from Argentina were detained in European ports (Correa 2006: 3).

According to Correa (2006: 4), an IP expert who worked for the Argentine Ministry of Agriculture during the quarrel with Monsanto, the corporation knew that it had few chances of winning the case because it lacked legal support but decided to start the lawsuit as a means to generate risks that would pressure the Argentine state

and soy growers to submit to the company's demands. The risk was that European importers would shift their demand to other suppliers (Correa 2006: 3), especially competing exporters of soybeans from Brazil, Paraguay and the US. In addition, if Monsanto won the case in Europe, 'the costs incurred for importers would probably be passed on to Argentine rural producers' (Nellen-Stucky and Meienber 2006: 4) because they are price takers operating in a competitive segment of the global soy commodity chain. Transnational competition between soy growers for foreign markets was again undermining their position in IP conflicts.

Monsanto's action made the conflict clearly larger than the private interests directly involved in the negotiations since it was affecting the economy in Argentina right after its recovery from a severe crisis (Correa 2006: 5). Monsanto's maneuver in Europe turned a conflict between rural producers and seed companies mediated by the state into a conflict between a nation-state and a foreign corporation. The event happened right when the Kirchner administration had just exercised its skills in bigger conflicts with the International Monetary Fund and foreign creditors. As stated by Secretary of Agriculture Miguel Campos 'The lawsuits endanger fair trade and call into question Argentina's ability to exercise its sovereign rights' (Nellen-Stucky and Meienber 2006: 4–5).

On 14 September 2005, Miguel Campos acknowledged he had participated in several meetings with Monsanto, one of which had been requested by US Secretary of Agriculture Mike Johanns (Palucito 2007: 7). During the talks with Secretary Johanns, Campos mentioned that the US had a key alliance with Argentina in international negotiations about biotechnology. The governments of the two countries had a pro genetically modified organism (GMO) stance in international forums and were partners in a case against anti-GMO regulations of the European Union. According to Campos, Johanns seemed unaware of these facts (interview with Miguel Campos, August 2010, Buenos Aires).

Later, a series of diplomatic telegrams disclosed by Wikileaks and published in the Argentine newspaper *Página 12* revealed that from 2006 to 2009 representatives of the US government recurrently pressured the Argentine state in favor of Monsanto. The telegrams report several meetings on the issue; attendees included (at different points): US ambassadors Lino Gutiérrez and Earl Anthony Wayne; US Senator

Charles Grassley (who argued that American farmers were at a disadvantage in relation to their Argentine competitors who did not pay royalties); US Representative Bob Goodlatte (who argued that the strength of the US economy laid in the innovative capacity of companies like Monsanto); US Secretary of Agriculture Charles Conner; Argentine Secretaries of Agriculture Miguel Campos, Javier de Urquiza and Carlos Cheppi; and the Argentine Minister of the Economy Felisa Miceli (Página 12, 03 March 2011).

The claim by Senator Grassley indicated once more the influence of transnational competition on the actions taken by rural producers and state officials in the politics of IP. Competition between soy growers from different countries was actually one of the reasons why Monsanto started to demand stronger protection for IP rights in South America. In July 2000, Tony Anderson, president of the American Soybean Association, which represents American soy growers, affirmed that their South American competitors were enjoying advantages that the US government and Congress should eliminate as soon as possible (*La Nación*, 23 July 2000). He referred specifically to the fact that Argentine soy growers did not pay royalties for Monsanto while American soy growers did. During a hearing at the US House of Representatives in June 2000, American soy growers accused Monsanto of treating Argentine rural producers better than their own compatriots (*La Nación*, 23 July 2000). Facing pressures within its home country, the corporation intensified the efforts to protect IP rights on seeds in South America.

In October 2005, Secretary Miguel Campos and the Argentine ambassador, Remes Lenicov, met with the European Union Commissary of Agriculture, Fisher Böel, to present their legal arguments concerning the actions taken by Monsanto in Europe. The Argentine government also decided to hire lawyers in Belgium, Denmark and Holland. In Brussels, it hired the renowned firm Remiche and joined big agribusiness corporations like Dreyfus in judicial actions against Monsanto in Europe (Palucito 2007: 7). On 12 November, Javier Jayo, president of CARBAP, declared support for Campos and stated that, by taking the issue to foreign courts, Monsanto had turned the conflict over royalties into a matter of state and national sovereignty (Jayo 2005).

At the end of January 2006, the Argentine government petitioned the European courts to be recognized as a third party in the lawsuits

(Nellen-Stucky and Meienber 2006: 4–5). European importers and the Argentine government then developed a common legal argument against Monsanto (Casella 2006: 7). A working group of lawyers from the Ministry of the Economy, the National Treasury and INASE was formed to work on the case (interview with INASE, August 2010, Buenos Aires). The thesis of the Argentine government and its allies was based on Article 9 of the European Union Biotechnology Directive, according to which protection by patent extends ‘to all material...in which the product is incorporated and in which the genetic information is contained and performs its function’ (Nellen-Stucky and Meienber 2006: 4–5). Clearly, the RR gene, which makes soybean plants resistant to glyphosate, was not exercising its function in soybean crush or oil imported by European countries and neither could have reproductive capacities (Casella 2006: 8).

The state had taken the fight as its own and proved to have the internal capacity and coordination to carry it out. According to the future minister of agriculture, Julián Domínguez, the dispute started by Monsanto was not just a matter of rural producers but a question of national interest (personal observation, Buenos Aires, 11 August 2010, at the *Jornada Biotecnología Agraria y Desarrollo Nacional*). From a distributive perspective, the state was trying to prevent a transnational corporation from appropriating a larger share of the surplus generated within the soy commodity chain (thereby protecting the shares accruing to local rural producers and the government). The centrality of soybean agriculture in the Argentine political economy (including the dependence of the state on the industry as a generator of export taxes and foreign currency) was behind the role played by the government during the conflict.

On 2 February 2006, Secretary Campos started an offensive against Monsanto on another front. He sent a letter to the president of the National Committee for the Defense of Competition demanding action to label the conduct of Monsanto abusive and illegal with regards to the country’s anti-trust legislation (Palucito 2007: 8). According to the secretary, there was an understanding within the Ministry of Agriculture that the state should support the rural producers. Campos repeatedly stated that royalties should be charged only at the moment of purchase of seeds and that patents should not be applied to plant varieties or their genes (interview with Miguel Campos, Buenos Aires, August 2010).

In the first week of March, during the *Expoachacra* exhibit, directors of the transnational corporation met with leaders of the agrarian sector in the search of an agreement (Palucito 2007: 10). At around the same time, Monsanto informed Miguel Campos that it would wait for the first judicial sentences from Europe before proceeding with 180 other charges it was prepared to file in other countries where the RR gene was patented. The company expected Campos to support the mechanism of royalty payments based on charges on exports in case the first sentences were favorable to Monsanto (Palucito 2007: 10). At the end of March, the Argentine chancellor instructed the Argentine embassies in Belgium, France, Germany, Austria, United Kingdom, Holland, Spain, Italy and Greece to formally present the Argentina's arguments against Monsanto to local customs offices (Clarín 26 March 2006; Palucito 2007: 10).

On 20 June, SAGPyA issued a new ruling restricting the right to save seeds. Resolution 338/2006 determined that rural producers were allowed to save seeds only in the amount necessary to cultivate the area originally sowed with legally purchased seeds. The organ also announced that different alternatives for the control of the seed market were being evaluated along with ASA and ARPOV (Palucito 2007: 11). According to Rossi (2006: 8), the measure was an attempt by SAGPyA to balance the demands of the seed industry and rural producers. The ruling, however, was criticized by both sides.

While SAGPyA acknowledged that it was 'not a solution to the black market, but a step in the right direction', Adolfo Mac, director of ASA, affirmed that 'We have argued that the right to save seeds should remain unrestricted for small rural producers but should not be free for large producers' (Palucito 2007: 11, author's translation). FAA argued that the resolution favored seed companies and had questionable legitimacy (Casella 2006: 1) by treating the right to save seeds as an 'exception' (Casella 2006: 5). On 22 June, SRA issued a public document rejecting the restriction on the right to save seeds. The organization said Resolution 338 was a unilateral action of SAGPyA and demanded that any changes to the IP regime allow for a period of transition and adaptation for soy growers (SRA, 22 June 2006). In the National Congress, Senators Mírian Curletti and Ricardo Taffarel presented projects of communication demanding the overturning of the resolution (Curletti 2006; Taffarel 2006). In her justification for the project, Curletti mentioned the perspectives of FAA and

SRA on the topic, indicating once more the influence of these organizations over members of the Parliament (Curletti 2006). Declarations from the Parliament had been largely favorable to rural producers. In 2004, Senator Mírian Curletti presented a communication project at the National Congress demanding from the executive 'immediate and reliable' action against Monsanto's attempts to charge royalties on RR soybeans (Curletti 2004). In 2005 and 2006, Representative Julio Martínez proposed projects in the same direction (Martínez 2005; Martínez 2006). Due to lack of regulation, Resolution 338 has not been enforced (interview with INASE, August 2010, Buenos Aires).

In November 2006, Monsanto's strategy produced another drawback. The conflict in Europe adversely affected the coalition of seed companies in Argentina. Because ASA initially sided with Monsanto and, in another dispute, with transnational company Syngenta, some smaller Argentine seed companies were unhappy and created a rival association – the Argentine Chamber of Seed Companies (*Cámara Argentina de Semilleros*) (Newell 2009: 45). After that, ASA and ARPOV seemed to change their discourse. A top official of these associations stated that the conflict between Monsanto and Argentina concerned only that corporation and not other seed companies operating in the country (interview, August 2010, Buenos Aires). Monsanto was becoming isolated while rural producers were strengthening their resistance with the support of the state.

In 2007, sentences favorable to the Argentine side of the dispute were issued in England in the case of Monsanto vs. Cargill, and in Spain, in the case of Monsanto vs. Sesostri (Casella 2010a: 12). At this point, SAGPyA was headed by Javier de Urquiza, who replaced Miguel Campos in February of that year. Urquiza was a leader of CRA, in another indication of the connections between the rural associations and the state.

In November 2008, in a public statement approved by ASA, transnational companies BASF, Dow, Syngenta, Monsanto, Bayer and Pioneer were already shifting the focus of negotiations to future biotechnological innovations, proposing a new system for royalty collection for varieties that had genes already patented (thus excluding RR soybeans) or with patent requests already filed. However, as earlier, they argued for a mechanism of collection operating at the moment of sale of the output by rural producers, which, according

to them, would encourage private companies to introduce the innovations needed to guarantee the 'competitiveness of the Argentine Republic in the world market' in the 'long run' (ASA, 20 November 2008, author's translation). Again, transnational seed companies were using the competition between rural producers in the world market as a way to obtain concessions in IP disputes.

On 9 March 2010, the general attorney of the European Union, Paolo Mengozzi, presented his conclusions in the case of Monsanto vs. Argentina. He recommended that courts did not respond to the judicial claims of Monsanto because, according to legislation of the European Union, protection given by a patent on a genetic sequence is limited to situations in which this genetic information effectively exercises the functions described in the patent (Casella 2010a: 13–14). On 6 July 2010, the European Union tribunal declared that the petition filed by Monsanto in the Netherlands was unjustifiable, putting an end to the claims of the company in Europe (Casella 2010b).

Conclusion

By 2013, private IP rights on seeds were narrowly defined and weakly enforced in Argentina in comparison to other top soybean exporting countries. The high level of economic development displayed by Argentina, the early and deep adoption of neoliberalism in the country, the commercial sanctions imposed by the US government and the intense pressure exerted by Monsanto were not enough to change this situation. For decades, the global trend toward stronger IP found a hostile environment in Argentine soybean agriculture.

The core legislation for Argentina's national IP regime on seeds was created in the 1970s. It established plant breeders' rights with three exceptions that made the regime permissive by contemporary standards. In the 1990s, when two major international treaties with rules about IP on seeds embodied the global trend toward stronger IP, the Argentine national IP regime on seeds was only minimally affected. Argentina signed the UPOV act of 1978, avoiding the deadline after which UPOV would allow only the 1991 act to be signed. No substantial changes to the national IP regime followed as the 1973 law of seeds already matched the minimum requirements of UPOV 1978. The new law of patents that resulted from Argentina's

signature of TRIPS opened the possibility for patents on agricultural biotechnology but inconsistencies with the law of seeds prevented its effective application to seeds. Meanwhile, enforcement practices were unable to augment the use of certified seeds or to increase the formalization of the soybean seed market.

Given the minimal penetration of the national IP regime on seeds by international regimes that embodied the global trend toward stronger IP, seed companies in Argentina promoted private IP regimes that increased the scope and strength of private IP rights on plant varieties. The system of extended royalties managed by ARPOV (Argentine Association for Protection of Plant Varieties), the project for global royalties and Monsanto's system of royalty collection were all instances of such regimes. These private systems of governance were partially embedded in the national and international IP regimes but also partially contradicted them. The project of global royalties was an attempt to partially denationalize and privatize Argentina's national IP regime by turning a state agency into a collector of private revenues. ARPOV's system found support in the Argentine Civil Code but questionably implied that the right to save seeds stated in the 1973 law of seeds was individually renounceable. Monsanto's system of royalty collection was actually a transnational project that the company tried to implement simultaneously in Argentina (without success), Brazil and Paraguay. Being based on private contracts negotiated asymmetrically between rural producers and large seed companies, these private – sometimes transnational – systems of governance hardly matched the requisites of democratic bargain, public accountability and legitimacy.

Associations of rural producers, NGOs and even some state officials interpreted the project of global royalties as turning a state agency into an operator of a private IP regime. They saw royalties paid to seed companies as analogous to export taxes, showing how Monsanto and other seed companies were being perceived as performing 'state-like' functions. However, while rural producers saw the state as a legitimate institution in relation to which they were 'citizens', they criticized the attempts by private companies to impose rights and obligations, to police their farms, to charge royalties based on patents not recognized in their country and – in the words of CONINAGRO (the Intercooperative Confederation of Agriculture and Livestock) – to try turning them into 'vassals'.

Overall, the situation that resulted from the intertwined trajectory of international, transnational and national IP regimes in Argentine soybean agriculture resembled an old developmental model of IP, in which rural producers enjoyed cheap access to seed technology through permissive legislation and weak enforcement practices. As argued in this chapter, this was a result of three factors.

Relationship between the state and knowledge-users

The capacity of rural producers to influence Argentine policy-makers derived in part from their participation in a corporatist committee (CONASE), from their connection with members of the Parliament and from their control of an industry that was crucial for the state because of its role as a generator of taxes and influx of foreign currency. The conflict over export taxes that took place between rural producers and the state during the Kirchner administrations did not prevent the government from acting in defense of soy growers in the dispute with Monsanto. The clash with the corporation became a matter of national versus foreign, in which national actors (state elites and rural producers) aligned to protect agricultural rents from undue appropriation by a foreign actor (Monsanto) in spite of an internal split over how the rents should be distributed domestically.

Competition in the provision of technology

The soybean seed industry in Argentina passed through a process of oligopolization in which the state agricultural R&D agency (INTA) lost its protagonist role to private companies that operated under the leadership of transnational corporations. On one hand, this meant that INTA assumed a passive role in IP policy-making and did not become an advocate of stronger protection for IP on plant varieties. On the other, the concentration of the provision of seed technology in private (and foreign) hands contributed to the emergence and strengthening of a defensive mobilization on the part of rural producers to retain the right to save seeds.

Mobilization of knowledge-users

The influence of rural producers over IP rule-making was also a result of their strong mobilization. Soy growers coordinated their actions under the same organizational framework for decades on a national scale (FAA, SRA, and the Argentine rural confederations – CRA and

CONINAGRO) and were able to link the right to save seeds to the national interest. FAA in particular was the most active organization, representing the interests of the segment of rural producers that is most sensitive to IP issues because of their weaker economic condition.

Transnational competition for foreign markets and technology was a force that worked in the opposite direction (making associations of Argentine rural producers and state authorities more inclined to accept restrictions on the right to save seeds in a compromise to gain access to new technology) but it did not predominate. If competition gains momentum or the conditions discussed above change, we might see the actual emergence of a new (more restrictive) law of seeds in Argentina as well as the full implementation of the private IP regime planned by Monsanto. If the right to save seeds without paying royalties is restricted to small farmers, large rural producers and *pools de siembra* will start paying royalties on every seed they plant. This will imply a transfer of income from the local agrarian elite to seed companies (especially the transnationals). In this case, the state will also be likely to see its share of the economic surplus of the agricultural sector diminish because rural producers will be even more reluctant to pay export taxes if they have to pay more royalties. Still, the new law of seeds would have emerged only after two decades of a successful resistance by rural producers, one that allowed them and the Argentine state to appropriate hundreds of millions of dollars over the years in productivity gains that would otherwise have accrued to transnational seed companies.

3

Brazil: The Neodevelopmental Model

Brazil did not have legislation for IP on seeds until the Law of Industrial Property (1996) and the Law of Protection of Cultivars (1997) were enacted as part of the post-1980 global trend toward stronger IP. The former is a law of patents, which allows patents on biotechnological processes that create transgenic seeds. The second established plant breeders' rights based on the UPOV convention of 1978 but also incorporated elements of UPOV 1991, such as protection to 'essentially derived varieties'. As with the Argentine law of seeds, it includes three exceptions to plant breeder's rights:

- the right of rural producers to save seeds;
- the right of plant breeders to use existing protected varieties to develop new ones without consent from the original cultivar owner;
- the right of the state to declare the restricted public use of certain varieties in cases of national interest.¹

In 2003, the enactment of the Law of Seeds and Seedlings imposed limitations on the right to save seeds, making the Brazilian IP regime on plant varieties even more restrictive. The enforcement of IP rights on seeds by the state was also strengthened, with a growing number of inspections in farms and confiscation of pirate seeds.

After the cultivation of RR soybeans was legalized in the early 2000s, Monsanto implemented in the country the private system of royalty collection it tried in vain for years to establish in Argentina. The system is based on the charge of a 'technological fee' on the

value of harvests sold by rural producers at trading houses or crushing industries. Soy growers have the option of paying the fee in advance when purchasing the seeds. Upon payment, they receive a document stating the amount of seeds purchased, which defines the amount of harvested soybeans they are later entitled to sell without having to pay the technological fee. This private IP regime also includes the application of tests to detect the presence of transgenic seeds in harvests and the charge of fines on rural producers that do not declare that their harvests contain Monsanto's proprietary technology. In practice, the system eliminates the right to freely save seeds. As a consequence of tighter legislation, stronger enforcement and Monsanto's private IP regime, from 64 to 85 per cent of soybean seeds cultivated in the 2000s in Brazil were certified.²

This reproduction of the global trend toward stronger IP in Brazil is puzzling considering that the Brazilian state has adopted a clear pro-knowledge-user stance in several international negotiations about IP. This was the case especially in disputes with transnational pharmaceutical corporations. Why has such a stance not been adopted in the formulation of IP laws applicable to plant varieties? Why has the Brazilian state not supported rural producers in the disputes with Monsanto that emerged after the company implemented its system of royalty collection in the country?

In this chapter, I show that Brazilian state agencies and rural producers were particularly affected by transnational competition for foreign markets and technology in soybean agriculture, making them vulnerable to demands from seed companies for stronger private IP. In addition, a state-owned agricultural R&D corporation with growing technological capacity became a supporter of stronger IP and tamed the mobilization of soy growers against IP by serving as an alternative source of seed technology for them. Rural producers also suffered from fragmented and unstable links to the state and from a narrow and weakly coordinated mobilization around IP.

Neoliberalism and intellectual property in Brazilian soybean agriculture (1990s)

From 1947 to 1989, members of the National Congress and the Ministry of Agriculture unsuccessfully tried to create a law for protection of IP rights on seeds in Brazil (Velho 1995: 117–236). Their attempts

were opposed by scientific associations and public research institutes. The strongest opposition came from EMBRAPA (*Empresa Brasileira de Pesquisa Agropecuária*) (Velho 1995: 118–122, 130). In 1973, the Brazilian state created EMBRAPA to organize and expand agricultural R&D activities that had been carried out by the state in a decentralized and non-systematic manner (Fuck and Bonacelli 2007: 92). In 1975, EMBRAPA founded a division specializing in soybeans (EMBRAPA Soja). Until the 1970s, soybean agriculture had been restricted to areas of temperate climate, which, in Brazil, correspond to a small fraction of the territory in the extreme south of the country. At EMBRAPA, scientists developed soybean varieties adapted to tropical climates, allowing the expansion of the culture to the whole national territory. This accomplishment helped establish EMBRAPA as a global leader in tropical agriculture.

In the 1970s, most of EMBRAPA's technical staff was opposed to the creation of private IP rights on plant varieties because national plant breeding in autogamous plants (such as soybeans) was still incipient and a law establishing plant breeders' rights would allow transnational corporations to dominate this segment of the seed industry (Velho 1995: 130). Working for a state-owned corporation, many of EMBRAPA's scientists saw agricultural knowledge as a public good that should not be the object of private IP rights. Without the endorsement of the agency, legislative proposals for creating private IP rights for seeds lacked legitimacy and were not effective until the mid-1990s (Velho 1995: 228).

In 1990, the incoming president, Fernando Collor de Mello, appointed new members to EMBRAPA's board of directors. Consistent with the neoliberal orientation of the Collor administration, the new head of the corporation was in favor of the creation IP rights on plant varieties (Velho 1995: 236). In 1991, as part of his commitment to international negotiations, President Collor created an inter-ministerial committee to work on a bill for a law of protection of cultivars. The committee had representatives from the ministries of Justice, Foreign Affairs, Economy, Treasury and Planning, Agriculture and Agrarian Reform (which included EMBRAPA) and from the Secretariat of Science and Technology (Velho 1995: 241).

EMBRAPA presented its own proposal at the committee, which was now in favor of plant breeders' rights (Velho 1995: 242). Pressure from the Ministry of Agriculture led EMBRAPA to opt for a

'second best' strategy, accepting endorsement of legislation compatible with the UPOV convention of 1978 but opposing the more restrictive version of 1991 (Velho 1995: 241). Behind the pressure put on EMBRAPA by the Ministry of Agriculture was the coercion exerted by the US government on Brazil during the Uruguay round of trade negotiations that resulted in the creation of the WTO and the signature of TRIPS (Velho 1995: 238, 245). Much of the EMBRAPA's staff was still against private IP rights on seeds. Their concern was not unwarranted as the corporation would soon be affected by budgetary cuts that would threaten its competitiveness vis-à-vis private companies (Filomeno 2013: 144).

The inclusion of this theme in the government agenda was also a result of the mobilization of interest groups from the sector of Brazilian agribusiness linked to transnational corporations (Araújo 2010: 29). These groups had strong connections and communication channels with the government (Araújo 2010: 29). In addition, the Ministry of Agriculture, which had lost power over agricultural policy during neoliberal reforms, probably saw in the new law an opportunity to increase its internal structure through activities related to the registration of cultivars and granting of plant breeders' rights (Araújo 2010: 72).

The proposal formulated by EMBRAPA was accepted by the legislative committee. The resulting bill recognized the right of rural producers to save seeds and even allowed small rural producers to donate and exchange seeds among themselves. However, it incorporated the concept of 'essentially derived variety', an element of UPOV 1991. Being the holder of the largest number of cultivars then commercialized in Brazil, EMBRAPA supported the rules about essentially derived varieties as a way to prevent the misappropriation of the results of its R&D by transnational companies. EMBRAPA also defended the application of the mechanism of pipeline to cultivars, an intellectual property rule that would allow seed companies to obtain plant breeder's rights over varieties that had been commercialized before private IP rights on seeds were allowed in the country (Araújo 2010: 79–80).

From the committee, the bill was forwarded to the National Council of Agricultural Policy, a collegiate organ under the executive power where the National Confederation of Agriculture (*Confederação Nacional da Agricultura* – CNA), the Organization of Brazilian

Cooperatives (*Organização Brasileira de Cooperativas* – OCB), the National Confederation of Rural Workers (*Confederação Nacional dos Trabalhadores da Agricultura* – CONTAG) and other organizations were represented (Velho 1995: 243). Founded in 1964, CNA is the pinnacle organization of the Brazilian agrarian bourgeoisie. OCB was founded in 1969 by large cooperatives of small rural producers from the south and southeast of the country. At the end of the 20th century, CNA had trouble responding to the increasing diversity of interests in the agricultural sector and lost legitimacy as the main channel of representation for the agrarian elites (Bruno 1997: XI–XII). Through alliances with agro-industrial sectors up and downstream of the farming sector, OCB was able to re-establish solidarity among agrarian elites, which was formalized with the foundation of the Brazilian Agribusiness Association (*Associação Brasileira de Agribusiness* – ABAG) in 1993 (Bruno, 1997: 21; Mendonça 2005: 18–19). CONTAG was founded in 1964 and is one of the largest trade unions of rural workers in the world.

In January 1996, the bill was submitted by the National Council of Agriculture to the Chamber of Deputies (Araújo 2010: 34). At the Committee of Agriculture and Rural Policy, presided by a congressman of the Workers' Party (*Partido dos Trabalhadores* – PT), a public assembly to discuss the bill was convened with the presence of representatives from the Agronomic Institute of Campinas (*Instituto Agrônomo de Campinas* – IAC), Assistance and Services to Projects in Alternative Agriculture (*Assessoria e Serviços a Projetos em Agricultura Alternativa* – ASPTA, an NGO linked to rural social movements), CNA, CONTAG, the Movement of Rural Landless Workers (*Movimento dos Trabalhadores Rurais Sem Terra* – MST) and the Brazilian Council of Phytosanity (*Conselho Brasileiro de Fitossanidade* – COBRAFI), among others (Araújo 2010: 65). COBRAFI represented agrochemical corporations and was one of the most active actors in the mobilization of the private sector in favor of the bill (Araújo 2010: 73). IAC, ASPTA, CONTAG and MST made known their disapproval of the legislation, while CNA and COBRAFI offered their support (Araújo 2010: 65). There was a split between organizations representing family agriculture (CONTAG, MST) and the traditional organization of the agrarian bourgeoisie (CNA).

Additional public hearings were held in June and July of 1996. Representatives of several organs of the Ministry of Agriculture and

EMBRAPA declared their support for the legislation as well as seed companies represented by the Brazilian Association of Seeds and Seedlings (*Associação Brasileira de Sementes e Mudas* – ABRASEM), OCB and CNA. ASPTA and IAC restated their opposition (Araújo 2010: 66). At this point, EMBRAPA's support was explained not only by its institutional subordination to the Ministry of Agriculture but also by the growing expectation that the law could benefit the agency. Since EMBRAPA was the largest holder of cultivars in the country it would benefit from royalty payments and be able to negotiate agreements with transnational companies that were working with genetic engineering and interested in inserting their genes into the corporation's cultivars (Araújo 2010: 72–73).

Congressman Carlos Melles, who had been assigned to analyze the proposal, added several modifications to the bill. In general, they made it less restrictive in response to demands from groups opposing the original bill. Among the modifications introduced was the reduction of the duration of IP rights on perennial plant varieties. In the original draft, the temporal extension of plant breeder's rights was set beyond the minimum number of years required by UPOV. Congressman Melles reduced it to the minimum required by UPOV 1978 (Araújo 2010: 67).

Approved in the Chamber of Deputies, the bill was sent for examination by the Senate. The mechanism of pipeline for plant varieties, which had been removed from the original bill in the Chamber of Deputies, was re-introduced by senators. Farmers' rights were strengthened by a modification allowing small rural producers not only to save, donate and exchange seeds but also to sell them to other small farmers. However, when the bill was sent back to the Chamber of Deputies, both changes were removed (Araújo 2010: 69–70). The legislation was finally approved by the National Congress in April 1997 giving birth to the Law of Protection of Cultivars. Two years later, the Parliament formally ratified UPOV 1978.

In his detailed analysis of the controversies around the legislation, Velho (1995) did not provide evidence of active participation by organizations of rural producers in the law-making process. According to Araújo (2010: 74), CNA seems to have abstained from seriously discussing the topic within the organization. Because of the complexity of the theme or to avoid a position contrary to that of a government aligned with its own liberal discourse, CNA delegated the formulation

of its position on the matter to an internal organ linked to seed companies. Segments linked to rural producers of grains, whose interests were contrary to those of seed companies, apparently did not have a strong voice within the organization (Araújo 2010: 74). It is no surprise that during public hearings at the Parliament the representative of CNA manifested in favor of the bill. OCB was somewhat divided on the matter because its membership includes rural producers of grains (which tended to oppose the law) and cooperatives that conduct research on plant varieties (which were supportive of the law). The clash between the two sides took place internally but publicly those in favor of the law prevailed, albeit including some reservations that favored rural producers (Araújo 2010: 74).

Finally, the group of congressmen who had traditionally defended the interests of the rural sector (*Bancada Ruralista*) was favorable to the law in spite of occasional public statements against certain aspects of the legislation. These declarations were a result of pressure from associations of rural producers. In part, the *Bancada Ruralista* was simply following the broader orientation of the executive power, to which they had almost always given support (Araújo 2010: 75). In the Parliament, the only active resistance against the law came from congressmen of opposition parties led by the PT.

Since its enactment, the Law of Protection of Cultivars has been the main ruling ensuring protection for IP rights on plant varieties in Brazil. More recently, the Law of Industrial Property started to be used by seed companies to obtain protection for IP rights on GM seeds. Passed in 1996, the Law of Industrial Property adapted Brazilian patent law to the TRIPS agreement. The law forbids patents on the whole or parts of living beings. Animals, plant varieties, seeds and even genes cannot be patented. The only GM organisms that can be objects of patents are GM micro-organisms (Rodrigues 2009: 35). The law does, however, allow patents on biotechnological processes that create GM plants, animals and micro-organisms. The holder of such patents can prevent others from producing, selling or importing products directly obtained through those processes without his/her authorization. This prerogative gives seed companies substantial control over the use of transgenic seeds by rural producers and plant breeders.

The original bill for the Law of Industrial Property was sent by the executive to the Congress in 1991. The expectation of the

government was that the legislation would encourage R&D investment in the country and give local actors access to the latest technology (Scholze 1998: 48–49). Because of its bias in favor of large private companies, the bill received support from the right-wing parties that formed the government coalition of President Collor. Leftist parties, congressmen representing large landowners, the national pharmaceutical industry, scientific associations, the labor movement, the Catholic Church and EMBRAPA opposed the legislation (Hermann 2004: 78–80). While EMBRAPA was reproducing its original stance on IP, large landowners were probably worried about the possibility of restricted access to plant varieties and animals that could eventually be patented.

Even within the executive, there was no consensus on the matter. In the succeeding administration of Itamar Franco (1992–1994), the ministers of Health, Culture, Transportation and Strategic Matters argued for the reduction of concessions made in the bill to foreign interests and defended an increase in incentives for national industry (Hermann 2004: 79–80). Pressure from the US government and transnationals in favor of the legislation was continuous and became particularly effective after the more nationalist orientation of President Franco was replaced by the neoliberal agenda of President Cardoso (1995–2002). In the face of the strength of Cardoso's administration in implementing a large set of pro-market reforms, the groups opposing the bill changed their approach, switching from a frontal opposition to a strategy of minimizing its negative effects (Hermann 2004: 118). The bill was approved by the National Congress and finally sanctioned by the executive in May 1996.

To sum up, during the 1990s pressure from the US government and transnational corporations for increased protection for private IP rights on seeds was reflected in Brazil by administrations with a neoliberal orientation. Domestically, these administrations had also been pressured by private seed companies. This process involved a forced change in EMBRAPA's position on plant breeders' rights. The capacity of rural producers to halt the institution of private IP rights on seeds was debilitated. On one hand, there was a general crisis of hegemony in the political representation of the agrarian sector, with CNA losing ground to OCB. On the other hand, when these two organizations were assigned to represent rural producers in the making of the Law of Protection of Cultivars they ended up serving the interests

of transnational corporations and seed companies that were also part of their membership. The lack of an independent mobilization of rural producers as knowledge-users in IP rule-making reduced their capacity to influence its outcomes.

Reforms to the Brazilian intellectual property regime on seeds and the contentious operation of Monsanto's system of royalty collection (2000s)

Not letting the profits go ... in Brazil

As recounted in Chapter 2, after Monsanto's patent on glyphosate – the herbicide used on RR soybeans – expired in Argentina, Chinese companies started to export the herbicide to the country at cheaper prices, prompting Monsanto to start an unsuccessful anti-dumping case. The same happened in Brazil, only with the opposite result: the Brazilian state responded favorably to Monsanto's demands despite complaints from local rural producers.

In August 2001, the Ministry of Development, Industry and International Trade initiated an anti-dumping investigation against imports of glyphosate from China. Monsanto's case to the Brazilian government was that Chinese producers were receiving government subsidies and practicing unfair competition (Monsanto, 14 May 2010), a claim that the company was also making in Argentina and in the US. In response, the ministry set an import tax of 35.8 per cent on Chinese glyphosate in February 2003 (Ministério do Desenvolvimento, Indústria e Comércio Exterior, 18 May 2011). In 2008, because of pressure from local importers of generic glyphosate, rural producers' organizations and a few congressmen linked to them, the import tariff was reduced to 11.7 per cent and, in 2009, to 2.1 per cent (Valor Econômico, 29 March 2010).

In February 2010, rural producers' organizations (OCB, CNA) and Congressman Luis Carlos Heinze publicly criticized the pressure that Monsanto had allegedly been exerting on the Ministry of Development, Industry and International Trade to re-establish a higher tariff on imports of glyphosate (Heinze 2010). For Congressman Heinze, higher prices for the herbicide in Brazil were harming the competitiveness of Brazilian rural producers *vis-à-vis* rural producers from Uruguay and Argentina, where glyphosate was being sold at cheaper

prices (Heinze 2010). As in Argentina, the actions of rural producers in IP-related conflicts were conditioned by transnational competition in world markets.

The allegations about Monsanto pressuring the Brazilian government were actually true. In May 2010, the corporation announced it would start importing glyphosate as opposed to producing it in Brazil because Chinese competition had purportedly made Monsanto's glyphosate factories in the country financially unfeasible. The first factory was established in 1976 in the city of São José dos Campos, São Paulo, and had produced glyphosate since 1984. Another factory was founded in 2001 to produce the raw material for glyphosate in the locality of Camaçari, Bahia. It was the result of an investment of around US\$200 million and had a thousand employees at the time of the anti-dumping case (Exame, 07 May 2010). As in Argentina, the risk of shutting down a factory was used by the company as a bargaining chip to obtain an increase in tariffs on Chinese glyphosate.

In June 2010, because of a petition by Monsanto, the Ministry of Development, Industry and International Trade initiated a revision of the tariff. In May 2011, it stated that the current tariff value was not enough to compensate for the dumping of Chinese imports (suggesting that the tariff would be increased). In the analysis made by the ministry, Monsanto's factory in Brazil was referred to as a 'domestic industry' threatened by Chinese imports (Ministério do Desenvolvimento, Indústria e Comércio Exterior, 18 May 2011). In August 2011, the ministry decided to finish the tariff revision process leaving the tariff rate unchanged (Ministério do Desenvolvimento, Indústria e Comércio Exterior, 12 August 2011). This, however, was not a response to the interests of rural producers but to a request made by Monsanto. The company justified the request based on the 'uncertainties in the global economy' that had made the international market unpredictable (Agrolink, 17 August 2011). In December 2012, in spite of unchanged import tariffs, Monsanto announced investments of circa US\$24 million to modernize its factory in Camaçari from 2013 to 2017 (Revista Globo Rural, 13 December 2012). As we shall see, over the same period the Brazilian government would also be more responsive to the interests of Monsanto on conflicts over IP on seeds than to demands of local soy growers.

Changes in Brazilian legislation

Since the enactment of the Law of Protection of Cultivars and the Law of Industrial Property in the mid-1990s, several attempts have been made to change IP legislation applicable to plant varieties in Brazil. With a few exceptions, they have tended to make the Brazilian IP regime more restrictive. Below I analyze four streams of legislative changes:

- the Law of Seeds and Seedlings (1998–2003);
- proposals to change the Law of Industrial Property (1999–today);
- proposals to change the Law of Protection of Cultivars (2002–today);
- the creation of and proposals to change the Law of Biosafety (2005–today).

Law of Seeds and Seedlings

In 1998, only one year after the enactment of the Law of Protection of Cultivars, the Brazilian Ministry of Agriculture drafted new legislation for the seed market. The Law of Seeds and Seedlings would regulate the production and trade of seeds but would not focus on issues of IP. In its second article, however, where several technical terms are defined, seeds for ‘self-use’ (*uso próprio*) are defined as ‘the amount of plant reproductive material saved by rural producers at each harvest for sowing or cultivation exclusively in the subsequent season in his/her property or in property under his/her possession taking into account, for the calculation of quantity, parameters determined by the National Register of Cultivars’ (author’s translation). Thus, an article that was supposed to simply define technical terms actually implied a restriction on the right to save seeds that was not stated in the Law of Protection of Cultivars. This law did not limit the use of saved seeds to the *subsequent* season only; neither did it establish quantitative parameters for the exercise of that right. According to the Coordination of the National Service for Protection of Cultivars at the Ministry of Agriculture (*Serviço Nacional de Proteção de Cultivares* – SNPC), some rural producers had been storing saved seeds in amounts exceeding their capacity for cultivation, which opened the way for the illegal commercialization of seeds (interview with SNPC, May 2011).

According to speeches by Senators Eduardo Azeredo and Agripino Maia, the proposal for the new law originated at EMBRAPA (Senado Federal do Brasil 2003: 18099–18101). Since the enactment of the Law of Protection of Cultivars, EMBRAPA had increasingly become an advocate for stronger private IP rights on seeds. The change within EMBRAPA was not merely ideological; it reflected the growing technological capacity of the corporation and its interest in protecting its own knowledge-intensive products. In Brazil, the privatization and denationalization of the world seed industry did not go as far as it did in Argentina or Paraguay, with important implications for the politics of IP on seeds in the country.

Until the early 1990s, the seed industry in Brazil remained balanced, having organizations of rural producers, private seed companies, the state and a few transnational corporations as the main players. In 1997, the approval of the Law of Protection of Cultivars encouraged the further penetration of transnational companies. A series of mergers and acquisitions of several national firms occurred led by transnational companies specializing in biotechnology (Wilkinson and Castelli 2000). In 1997, the Brazilian Association of Plant Breeders (*Associação Brasileira de Obtenores Vegetais* – BRASPOV) was founded by mostly transnational seed companies and joined ABRASEM in the representation of the interests of the seed industry. Despite the reduction in the participation of local private seed companies in the market for soybean seeds, organizations of rural producers and, especially, the public sector remained important actors (Fuck and Bonacelli 2007: 108). In 2000/2001, EMBRAPA alone owned 27 per cent of protected cultivars actually used in the production of seeds (a share that increases to 41 per cent if its partnerships with organizations of rural producers are included) (Carvalho 2003: 145).

As an indicator of the stature of EMBRAPA, Table 3.1 shows the average government expenditure on agricultural R&D in Brazil and Argentina. The 1990s were a period of decline in government expenditure on agricultural R&D in Argentina and Brazil, which was followed by a recovery only in the 2000s. Despite Argentina's recovery, by 2006 the country's government expenditure on agricultural R&D was still only a small fraction of Brazil's. For Paraguay, the numbers are even smaller and there was actually a decline from 1996 to the mid-2000s.

Table 3.1 Average government expenditure in agricultural R&D in Argentina and Brazil (1981–2006, million US\$ of 2005)^a

	Argentina	Brazil	Argentina/Brazil (%)
1981–83	44.7	486.57	9.19
1990–92	53.53	603.13	8.88
2000–02	50.43	555.6	9.08
2004–06	96.1	565.53	16.99

^a For Paraguay, the only comparable data available from the Agricultural Science and Technology Indicators (ASTI) – Consultative Group on International Agricultural Research (CGIAR) are 8.3 million US\$ of 2005 in 1996 and an average of 6.55 million in 2004–06.

Source: Filomeno (2013), based on data from the ASTI-CGIAR.

The bill for the Law of Seeds and Seedlings was further elaborated with the assistance of the Sectorial Chamber of Seeds and Seedlings of the Ministry of Agriculture and subjected to a public debate in August 1998 with the presence of 400 people (Câmara dos Deputados 1998). In November 1998, the bill was sent to Congress. It already included the restriction on the right to save seeds mentioned before. Between March and May 2002, public hearings to discuss the legislation were held at the National Congress with the attendance of representatives from the Ministry of Agriculture, BRASPOV, EMBRAPA, CNA, the Brazilian Association of Soy Growers (*Associação Brasileira dos Produtores de Soja* – APROSOJA) and OCB, among others (Micheletto 2002a: 4–5). Congressman Moacir Micheletto, who had been assigned to analyze the legislation, was in favor of the creation of the law. He recommended the rejection of an amendment presented by Congressman João Grandão (PT) that would make the definition of seeds for ‘self-use’ less restrictive (Micheletto 2002b: 3–4). Congressman Micheletto had close relations with the seed industry and big agribusiness. In the elections of 2006, among the top donors to his re-election campaign were transnational corporation Bunge and *Sementes Maua*, a seed company whose owner is Ywao Myiamoto, a former president of ABRASEM (CongressoAberto 2011).

Approved in the Chamber of Deputies, the legislation was sent to the Senate in December 2002. It was approved a few months later, in 2003, without significant discussions on the right to save seeds. In July 2004, the detailed regulation of the application of the law took

place through Presidential Decree no. 5153. Among other things, the decree established norms increasing state control over the right to save seeds and restated the restriction of the use of saved seeds to the subsequent season only. In June 2005, the Ministry of Agriculture issued Norm Directive (Instrução Normativa) no. 9 reinforcing those same rules.

EMBRAPA's advocacy for stronger IP rights on seeds was not confined to changes in national legislation. In 2001, the agency sent a legal representative to neighboring Paraguay to negotiate measures with the government to guarantee the protection of EMBRAPA's IP rights on soybean varieties used in Paraguay (Folha On Line, 02 February 2001). In that year, 48 per cent of the soybean cultivars used in the neighboring country had been developed by EMBRAPA but were in the public domain (Folha On Line, 02 February 2001). EMBRAPA also changed its own IP policy. In 1996, it launched its 'institutional policy of intellectual property' reconciling its social mission as a state-owned corporation with the opportunity for obtaining profits from the commercial exploitation of its research (interview with EMBRAPA's IP department, May 2011). The company explicitly stated that the exclusive appropriation of IP rights over the cultivars it develops was a national strategic imperative (EMBRAPA 2000a; 2000b quoted in Carvalho et al. 2007: 15). In 1998, EMBRAPA created a secretariat for IP, today called Assistance of Technological Innovation. Collaborative projects with private institutions have been strongly monitored to ensure that EMBRAPA's knowledge and research efforts are properly protected and remunerated when used by private companies (Carvalho et al. 2007: 15).

In certain aspects, EMBRAPA has become more like private companies. Indeed, the corporation has several joint-ventures with private actors, especially organizations of local seed producers (interview with EMBRAPA Soja, June 2011). Through these joint-ventures EMBRAPA has obtained financial resources, infra-structure and personnel. In 1997, EMBRAPA established a partnership with Monsanto for the insertion of the RR gene in cultivars developed by EMBRAPA. Monsanto had entered the Brazilian soybean seed market that year, with the acquisition of FT Sementes and Agroceres, then two of the main private seed companies in Brazil. In 1996, EMBRAPA firmed a contract of technical cooperation with BASF to develop a new variety of GM soybeans resistant to herbicides of the imidazoline type,

which would eventually compete with the glyphosate-resistant varieties containing Monsanto's RR gene. Unlike the partnership with Monsanto, in the joint-venture with BASF, EMBRAPA owns not only IP rights on the soybean variety in which the gene patented by BASF is inserted but also over the process of genetic transformation of the plant. EMBRAPA also has cooperative projects with international and foreign public agencies with the goal of avoiding dependence on transnational corporations (interview with EMBRAPA Soja, June 2011).

In another demonstration of its growing support for stronger IP rights, in July 2006 EMBRAPA and COODETEC (an agricultural research company owned by a cooperative of 185,000 rural producers) issued a technical note pointing out the negative effects of the use of uncertified seeds saved by rural producers (Portal do Agronegócio, 14 July 2006). In October 2010, EMBRAPA, BASF and ABRASEM issued a joint press release presenting a protocol signed by the three organizations to assure that the new GM variety developed by EMBRAPA and BASF would reach rural producers only through the formal market (EMBRAPA, BASF and ABRASEM, 20 October 2010).

Proposals to amend the Law of Industrial Property

Since the late 1990s, several bills have been presented by members of the National Congress to change the Law of Industrial Property. Most of them concern IP rights on pharmaceuticals but a few have potential implications for IP rights on plant varieties. In March 2005, Congressman Antonio Thame (the Brazilian Social Democracy Party) proposed an amendment to the law allowing patents on substances and materials extracted from living organisms (Thame 2005). The proposal is still under discussion and has already received opposition from Congressman Nazareno Fonteles (PT), who presented another bill prohibiting patents on GM organisms in April 2006 (Fonteles 2007). Congressman Fonteles had also presented a bill reducing the duration of patents to ten years but it was rejected by two committees of the Chamber of Deputies and later withdrawn by the congressman (Fonteles 2005). In May 2008, Fonteles presented another bill requiring private actors to disclose the geographic origin of genetic resources used in patented biotechnology and to give proof of benefit-sharing with countries or communities providing those resources (Fonteles 2008). This proposal was also not approved.

Proposals to amend the Law of Protection of Cultivars

Only five years after the enactment of the Law of Protection of Cultivars, a proposal to change it was already being formulated within the Ministry of Agriculture with the assistance of EMBRAPA (interview with the Coordination of the SNPC/Ministry of Agriculture, May 2011). Overall, the amendment would make the law more restrictive, giving plant breeders' rights the same level of protection given to patents (Daniela Aviani, SNPC/Ministry of Agriculture, speech at the Brazilian Chamber of Deputies, in *Câmara dos Deputados* 2009: 18–19).

In 2005, the proposal was sent to the ministries of Agrarian Development and the Environment, which jointly opposed the amendments. The Ministry of Agrarian Development was created in November 1999 by President Cardoso. It became responsible for policies for family agriculture and agrarian reform, which had previously been carried out under the Ministry of Agriculture. Its constituency are rural social movements, rural trade unions and NGOs that speak for small rural producers and are represented at the National Council of Sustainable Rural Development. In contrast, the Ministry of Agriculture became focused on large scale agribusiness. These different roles explain why the proposal to change the Law of Protection of Cultivars emerged from within the Ministry of Agriculture but was opposed by the Ministry of Agrarian Development. Excluded from decision-making within the Ministry of Agriculture, rural social movements were not able to halt the bill from the beginning.

Another characteristic of the state bureaucracy responsible for the agrarian sector also diminished the capacity of rural producers to influence the creation of new legislation for IP. The Law of Protection of Cultivars authorized the creation of the National Committee for Protection of Cultivars, a collegiate organ composed of representatives from the public and private sectors that would assist the SNPC. Although its first members were appointed in 1998, the committee never became a reality (interview with the Coordination of the SNPC, Ministry of Agriculture, May 2011). Therefore, discussions about the proposal to change the law have taken place across different committees, especially the Committee of the Soybean Production Chain (created in 2006) and the Committee of Agricultural Inputs (created in 2004). These are collegiate organs within the Ministry of Agriculture with representatives from the public and private sectors

that assist the ministry in the formulation of agricultural policies. Neither of these two committees specializes in the seed industry or in IP in agriculture. The Committee of the Soybean Production Chain discusses any topic affecting soybean agriculture, from international trade to environmental issues. The Committee of Agricultural Inputs discusses topics as diverse as rural credit, fertilizers and rural insurance.

On 21 May 2009, the proposal by the Ministry of Agriculture to change the Law of Protection of Cultivars was presented by Daniela Aviani (SNPC) at the Committee of the Soybean Production Chain with the presence of representatives from CNA, APROSOJA, the Brazilian Rural Society (*Sociedade Rural Brasileira*) and EMBRAPA Soja, among others (Ministério da Agricultura, Pecuária e Abastecimento 2009a). On 28 September of that year, the same proposal was presented by another official of the SNPC (Ricardo Machado) at the Committee of Agricultural Inputs. This time, CNA, OCB, ABRASEM, EMBRAPA and other organizations were represented (Ministério da Agricultura, Pecuária e Abastecimento 2009b). As stated by the official in the presentation, the motivations for the bill were the potential for Brazil to become a leader in agricultural technology, the need to encourage R&D investment and the fight against seed piracy. Specifically, the new law would:

- allow only small producers to save seeds;
- increase penalties to seed piracy;
- extend the scope of plant breeders' rights beyond the reproductive material (the seed) to include also the commercial product obtained from the harvest;
- extend the duration of the protection from 15–18 to 20–25 years (Aviani 2009).

All these changes would bring Brazilian law closer to UPOV 1991.

According to EMBRAPA's department of IP (interview, May 2011), the corporation 'strongly supports the changes proposed to the Law of Protection of Cultivars... especially concerning the right to save seeds, which today is used with no distinction by small and big rural producers, allowing the piracy of seeds. Our proposal is the proposal of the Ministry [of Agriculture].' Sources from the Association of Soy Growers of Mato Grosso (*Associação dos Produtores de Soja do Mato*

Grosso – APROSOJA-MT) confirm that EMBRAPA – an institution that creates technology and thus could benefit from increased royalty payments – has supported the proposal of the ministry (interview, June 2011). From 2001 to 2006, EMBRAPA's revenue from royalties increased 39 per cent per year – from R\$3,117,000 to R\$16,210,000 (data from EMBRAPA's IP department). By 2011, EMBRAPA's revenue from technology transfer was equivalent to 1.14 per cent of its budget (against an average of 0.9 per cent for US public research institutions) (Teixeira 2011: 8).

As stated by EMBRAPA's IP department, the bill has not yet been submitted to the Congress because of opposition from organizations representing big rural producers and some NGOs (interview, May 2011). The main reason for the opposition from big rural producers is the restriction on the right to save seeds, while NGOs are mostly concerned with possible negative effects on family farming (interview with EMBRAPA's IP department, May 2011). Indeed, in June 2009, an alternative draft for changes in the law was presented by NGOs to the Ministry of Agriculture. The ministry, however, responded with a technical report sent to the Civil Cabinet rejecting the proposal (Machado 2010). A source from APROSOJA-MT, which represents large soy growers, stated that when the ministry's legislative proposal was discussed at the Committee of the Soybean Production Chain, its representatives asserted that the bill had been unilaterally formulated to benefit seed companies, especially transnationals, and argued that further debate was needed (interview, June 2011). According to a leader of the Association of Soy Growers of Rio Grande do Sul (*Associação dos Produtores de Soja do Rio Grande do Sul* – APROSOJA-RS), Monsanto has a strong lobby within the Ministry of Agriculture and has pressured for changes in the law (interview with APROSOJA-RS, May 2011). His view is consistent with a claim from official Argentine sources that Monsanto has lobbied the Brazilian and Paraguayan governments so that they do not follow Argentina's resistance against the company's IP interests (Newell 2009: 43).

In spite of this shared criticism, APROSOJA-RS and APROSOJA-MT do not have the same perspective on restrictions on the right to save seeds, which has hindered the emergence of a nationally coordinated resistance by soy growers against legislative reforms favoring seed companies. According to sources from APROSOJA-MT, the practice of saving seeds is not as common in Mato Grosso as it is in Rio

Grande do Sul because certified seeds are thought to have a higher agronomic performance. Therefore, although the organization finds the proposal from the ministry too restrictive, it would be willing to accept that only the first generation of seeds obtained from certified seeds can be saved or that the use of saved seeds be subject to royalty payments equivalent to a fraction of the royalties paid for the original certified seeds (interview with APROSOJA-MT, June 2011). In contrast, APROSOJA-RS represents smaller scale soy growers that are more sensitive to seed costs and thus more radically opposed to restrictions on the right to save seeds.

While the bill formulated by the Ministry of Agriculture was being discussed within the executive, three congressmen presented proposals to change the Law of Protection of Cultivars in the Parliament. The first was Rose de Freitas (Brazilian Democratic Movement Party), who presented bill PL 2325 on 31 October 2007 (Freitas 2007). According to this bill, plant breeders' rights are extended to the product obtained from the cultivation of protected plant varieties. In this case, rural producers would need authorization from the cultivar owner to commercialize their harvests. The second proposal came from Moacir Micheletto, who presented bill PL 3100 on 26 March 2008 (Micheletto 2008). His proposal restricts the right to save seeds to small rural producers, indigenous peoples and participants in programs of agrarian reform (all other rural producers would lose the right to save seeds). Finally, Congressman Beto Faro (PT) was the only one to propose changes making the Brazilian IP regime less restrictive. Because his proposal was presented in 2010 – after conflicts over Monsanto's system of royalty collection intensified – it will be analyzed later in this chapter (Faro 2010a).

In June 2008, a public hearing to discuss the bills proposed by Micheletto and Freitas was held by the Committee of Agriculture of the Chamber of Deputies. Among the participants were the coordinator of SNPC and representatives from CONTAG, ABRASEM, BRASPOV, CNA, ASPTA and the National Articulation of Agro-ecology (*Articulação Nacional de Agroecologia* – ANA, a network of NGOs and social movements that includes the MST) (report by Congressman Leonardo Vilela (Vilela 2009)). CNA and soy growers manifested reservations to the projects, while CONTAG and ANA expressed their frontal opposition (interview with ASPTA, May 2011).

According to sources linked to APROSOJA-RS, Congressman Micheletto was confronted with questions about the motivations

behind his proposed amendment. Being a member of the *Bancada Ruralista* one would expect an action in favor of rural producers, but according to those sources members of the Parliament (including the *ruralistas*) are 'well treated' by Monsanto (interview, May 2011). In fact, as stated by sources from APROSOJA-MT, soy growers from Rio Grande do Sul expressed their opposition to the amendment but Congressman Micheletto's response has been restricted to postponing its final consideration by the Congress (interview, June 2011).

In sum, the bill formulated within the Ministry of Agriculture was discussed by different committees composed of representatives from different organizations and transferred for discussion across different ministries. Although this process exposed the bill to a broad range of actors, the shifting and fragmented nature of the negotiation – typical of a pluralist pattern – made it difficult for each of the organizations representing rural producers to accumulate knowledge about IP in agriculture, to formulate consistent positions across venues and to form a coalition against the bill. According to a source linked to APROSOJA-RS, this 'disorganization' of the rule-making process benefits those who are better 'articulated' – the 'plant breeders and seed companies' (interview, December 2012, translation by the author).

Finally, the interviews conducted for this research between May and June of 2011 showed no evidence of collaboration between organizations representing family agriculture (CONTAG, MST, ASPTA, ANA) and those representing soy growers in the mobilization against attempts to curtail the right to save seeds. In February 2009, 21 organizations linked to the rural sector sent a letter to the president stating their opposition to the proposals for changing the Law of Protection of Cultivars (ANA et al. 2009). Among them were CONTAG and MST, but none of the organizations represented soy growers. NGOs and rural social movements oppose the large-scale capital-intensive export-oriented model of agriculture practiced by soy growers and therefore have not joined them in conflicts with seed companies. This lack of a broad coalition of knowledge-users diminished their capacity to change the Brazilian IP regime.

The Law of Biosafety

In January 1995, the Brazilian Law of Biosafety was enacted to regulate the use of genetic engineering and the release of GM organisms in the environment. It created the National Technical Committee of Biosafety (*Comissão Nacional de Biossegurança* – CTNBio) under the

executive power to evaluate and authorize the use of GM organisms. In June 1998, Monsanto requested from CTNBio authorization to commercialize RR soybeans in Brazil. In September of the same year, the committee gave the requested authorization causing anti-GM technology activists to protest. The Institute for Defense of Consumers (*Instituto de Defesa do Consumidor*) and Greenpeace initiated a lawsuit against the Brazilian state and Monsanto. They questioned the legal competence of CTNBio and claimed that studies about the biosafety of RR soybeans had not been properly conducted. MST and the Brazilian Ministry of the Environment also came out against Monsanto and CTNBio.

While the judicial process was unfolding, RR seeds that had been smuggled from Argentina into Brazil since the late 1990s were being illegally cultivated on a large scale in Rio Grande do Sul. Monsanto claimed that the seeds had been illegally carried across the border but sources from INASE stated that RR seeds had been legally exported from Argentina after the corporation applied for an export request (*solicitud de exportación*) (interview with INASE, Buenos Aires, August 2010).

After realizing the benefits of the RR technology, rural producers from Rio Grande do Sul started to demand from the Brazilian government the legalization of RR soybeans. The lobby of soy growers and Monsanto was effective. Several presidential decrees provisionally authorized the commercialization of specific annual harvests containing RR soybeans until a new law of biosafety was approved in 2005 (law no. 11.105/2005). The new law recognized the legal competence of CTNBio to authorize the commercialization of GM seeds, putting an end to the controversies around the cultivation of RR soybeans.

In Article 6, the new law bans from Brazil genetic technologies that create sterile living beings. These are the so-called 'terminator' technologies on which a moratorium was imposed by the signatories of the 1992 International Convention on Biological Diversity (which includes Brazil). When applied to plants, the technology results in sterile seeds. In practice, this means a biological protection for IP rights on plant varieties since rural producers would not be able to replant seeds saved from their harvests. The prohibition of terminator seeds in Brazil was a result of opposition from environmental groups and rural social movements. Nevertheless, in July

2009, Congressman Cândido Vaccarezza (PT) presented a bill eliminating the ban on terminator technologies. On the Chamber of Deputies website, the electronic file containing the original law proposed by Vaccarezza shows as its author Patricia Fukuma (Vaccarezza 2009). Fukuma is a lawyer specializing in biotechnology and a member of the board of the Council of Information on Biotechnology (*Conselho de Informações sobre Biotecnologia*), a pro-biotechnology NGO whose supporters are Monsanto, Syngenta, Pioneer and Du Pont, among other biotechnology corporations. Rural social movements (such as MST) and environmentalist NGOs have opposed the bill, which is still under discussion in the Congress.

The legalization of RR soybeans and the disputes over Monsanto's system of royalty collection

In 2003, the first presidential decree provisionally authorizing the commercialization of RR soybeans was issued. Monsanto took the measure as an opportunity to start implementing a private system of royalty collection in the country. In that year, the company sent a letter to Brazilian soy growers and international trading companies stating that selling RR soybeans without paying royalties in Brazil could result in the confiscation of the product in foreign destinations as a result of legal measures taken by Monsanto (IstoÉ Dinheiro, 25 June 2003). In reaction, the governor of the state of Paraná, one of the largest soybean producing areas, announced the intention of expropriating a farm that Monsanto had been using as an experimental station for GM seeds. Minister of the Civil Cabinet José Dirceu ordered the general attorney of the federal government to take legal actions against the corporation. Minister of the Environment Marina Silva publicly criticized the company for trying to charge royalties on harvests whose sale had been authorized only provisionally (IstoÉ Dinheiro, 30 July 2003). Soy growers, who until then had benefited from the informal commercialization of royalty-free RR seeds, expressed their discontent with Monsanto's demand through the Federation of Agriculture of Rio Grande do Sul (*Federação de Agricultura do Rio Grande do Sul – FARSUL*) (IstoÉ Dinheiro, 02 July 2003). As soon as IP issues became prominent, the pro-GM technology coalition of soy growers and Monsanto started to crack. To avoid it, Monsanto hosted a seminar in July 2003 in an upscale hotel in Paraná, inviting representatives from the main agricultural cooperatives of the

country with a peace-making discourse toward rural producers (IstoÉ Dinheiro, 02 July 2003).

In September 2003, the second presidential decree authorizing the temporary commercialization of harvests containing RR soybeans was issued. This time, it stated that soy growers were exclusively responsible for the cultivation of RR seeds, including obligations related to the 'occasional rights of third parties' – a hint on Monsanto's IP rights (Article 9, *Medida Provisória* n. 131, 25 September 2003). This was enough for the corporation to understand that it had sufficient legal grounds to demand royalty payments. Monsanto proceeded with negotiations with local organizations.

In January 2004, the company announced it had reached an agreement with soy growers of Rio Grande do Sul for the collection of royalties, promising to invest part of the resulting revenues in local research projects (Folha On Line, 29 January 2004). In fact, in April of that year Monsanto and EMBRAPA signed a contract of technical cooperation for the development of soybean cultivars containing the RR gene adapted to the Brazilian climate (EMBRAPA, 25 November 2004). Supporting Monsanto's actions were a bunch of patents corresponding to components of the RR technology that had been patented in Brazil thanks to the mechanism of pipeline stated in the Brazilian Law of Industrial Property (this mechanism grants to the patent applicant the possibility of patenting substances and compositions that were no longer novel but were non-patentable until 1996). The first patent was granted in August 1999 and the last in April 2007 (Rodrigues 2009: 81–2).

However, according to APROSOJA-RS, soy growers were not actually consulted about the implementation of Monsanto's system of royalty collection, which ended up being imposed unilaterally by the company. The agreement mentioned by the corporation had involved only local seed companies that multiply and commercialize RR seeds (receiving for that a share of the royalties) (interview with APROSOJA-RS, May 2010). This version is supported by statements from FARSUL and the Federation of Agricultural Workers of Rio Grande do Sul (*Federação dos Trabalhadores da Agricultura do Rio Grande do Sul* – FETAGRS) (interviews, May 2011). In fact, in January 2005 a cooperative of rural producers from Rio Grande do Sul obtained a provisional court ruling based on the Law of Protection of Cultivars exempting its members from paying royalties on their RR harvests.

According to the ruling, rural producers should pay royalties only on purchase of seeds (Consultor Jurídico, 11 January 2005). One month later, however, this decision was overruled by a higher court in favor of Monsanto (Terra, 18 February 2005).

It was only in April 2005 that FARSUL accepted an agreement with Monsanto according to which rural producers would immediately start paying royalties equivalent to 1 per cent of the value received per bag of soybeans sold to crushing industries and trading companies (Sul Rural, 04/2005). As said before, under this system, the origin of seeds (saved or purchased, certified or pirate) becomes irrelevant because the company appropriates part of the value of the rural producer's output. The agreement was made at the same time that the MERCOSUR ministers of agriculture were discussing the adoption of a common stance on this issue, which, as discussed in Chapter 2, never became effective. The understanding with FARSUL facilitated the extension of Monsanto's system to the entire country. According to a representative of FARSUL responsible for topics related to the seed industry, the availability of new technology has a cost that needs to be paid for and Monsanto's rights are based on Brazilian law (interview, May 2011). His statement indicates that some soy growers were submitting to Monsanto's demands because of fear of not having access to crucial technology in the future, something that would harm their long-term competitive position. In fact, within South America, Brazilian soy growers have been the most vulnerable to transnational competition in the soy world market.

Figure 3.1, based on data provided by FAO, shows the change over time in the share of world soybean production for Argentina, Brazil and Paraguay, from 1975 to 2010.

In relative terms, the three countries have seen their shares in world production increase every year (which has happened mostly at the expense of the share of the US), but at different paces (and with the exception of declines in shares for Argentina from 1990 to 1995 and for Brazil from 1980 to 1985). After the cultivation of RR soybeans was authorized in Argentina in 1996, the country recovered from a loss in its share of world production, obtaining an increase in its share from 9.56 per cent (1995) to 12.48 per cent (2000).³ For Brazil and Paraguay, it is difficult to point out the effects of the adoption of RR soybeans, because before they were officially authorized

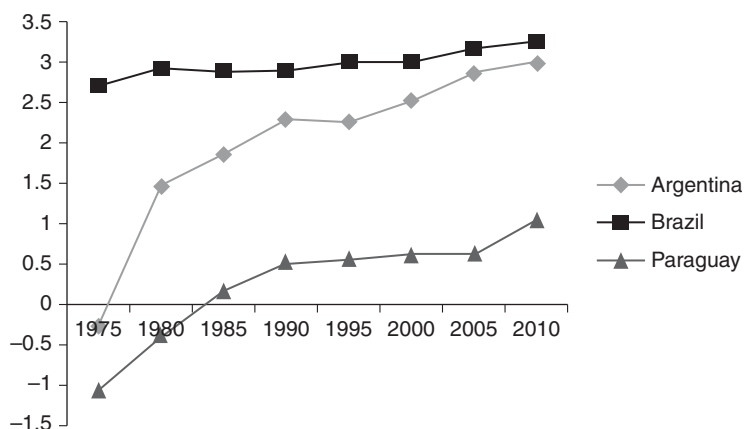


Figure 3.1 Shares in world soybean production – Argentina, Brazil and Paraguay (1975–2010, percentages converted to normal logarithm).

In the conversion of percentages into normal logarithm, percentages between 0 and 1 per cent turn into negative values (see Argentina and Paraguay). The logarithmic conversion allows a more accurate graphic representation of relative changes over time.

in the mid-2000s they had been smuggled and illegally cultivated since the mid-1990s. Anyway, when Brazil and Paraguay authorized the use of RR soybeans, their share in world production had increased only 17.54 per cent and 0.54 per cent respectively from 2000 to 2005 (against an increase of 43 per cent in Argentina's share), which might have motivated the authorization of the RR technology in the two countries.

More importantly, from 1975 to 2010, Argentina is the country whose share in world production has increased the most (more than 20 times), which helps understand why the country has been the least sensitive to losses of competitiveness that could eventually stem from lack of access to new technology. In contrast, Brazil has been the country most threatened by competition from its regional peers, which have been very successful in catching up with the region's top producer. Thus, it is understandable that Brazilian soy growers and state agencies might be particularly keen to obtain new technology capable of increasing the competitiveness of Brazilian soy growers and, therefore, more willing to make concessions to foreign seed companies in the form of a stronger protection for IP rights.

The period of royalty-free illegal cultivation, which ironically was extended because of the strong mobilization against GMOs in Brazil, had ended. At first, ABRASEM issued a public note alerting its members to abusive aspects of contracts being presented by Monsanto to local seed companies that multiply and sell seeds containing the RR gene. The organization recommended that such contracts should not be signed (Reis 2005: 1). However, after a new round of negotiations, Monsanto agreed to assign a larger share of the royalties to local seed companies, which resulted in ABRASEM supporting the new system (Reis 2005: 1). Organizations representing soy growers, however, continued to see the system as something unilaterally imposed by the corporation (interview with APROSOJA-RS, May 2010).

Amid these conflicts, the Ministry of Agriculture, which during the MERCOSUR negotiations had stated that royalties should be paid only at the purchase of seeds, now adopted a passive role. In April 2005, Minister Roberto Rodrigues alerted soy growers to the risks of direct negotiations with Monsanto, stating that negotiating should be done by the governments of MERCOSUR (Agência Estadual de Notícias do Paraná, 11 April 2005). Later, however, the ministry decided 'not to interfere in a negotiation between private actors, since rural producers agreed to pay compensation for the use of a patented technology' (Daniela Aviani, SNPC/Ministry of Agriculture, speech at the Brazilian Chamber of Deputies on 15 September 2009, in *Câmara dos Deputados* 2009: 17, author's translation). According to APROSOJA-MT, the Brazilian government mistakenly assumed, based on the statements of a few rural leaders (probably linked to FARSUL), that most soy growers had agreed with the method of payment designed by Monsanto (interview, June 2011). In fact, this was not a random mistake by the government but a position in line with the legislative reforms that had been promoted by the Ministry of Agriculture and EMBRAPA to make the Brazilian IP regime more restrictive.

EMBRAPA actually became one of the main beneficiaries of Monsanto's system of royalty collection. Since the cultivation of RR soybeans became legal, soy growers using RR seeds have had to make payments to seed companies twice. First, when they purchase the seeds, they pay a royalty included in the price of each seed bag. This payment corresponds only to the cultivar in which the RR gene was inserted, not to the RR genetic technology. As such, the payment

is regulated by the Law of Protection of Cultivars and is made not necessarily to Monsanto, but possibly to local seed companies or EMBRAPA if they own the cultivar containing the RR gene. Second, when rural producers sell the harvest that originated from the cultivation of those seeds, they pay royalties corresponding to the RR technology. This payment, which can also be made in advance, is regulated by the Law of Industrial Property. Although this law does not allow patents on genes or transgenic organisms, it allows patents on genetically engineered technology (Rodrigues 2009). In addition, as part of the agreement between EMBRAPA and Monsanto, a share of Monsanto's revenue from royalties is assigned to EMBRAPA.

In 2008, after two years without changing royalty values, the company decided to increase them by 16.67 per cent. FETAGRS and FARSUL criticized the decision for being unilateral and not negotiated with rural producers (Zero Hora, 08 August 2008). In the first half of 2009, the rural trade unions of Passo Fundo, Sertão and Santiago in Rio Grande do Sul started a lawsuit against Monsanto questioning the validity of patents on RR soybeans and claiming the right to save seeds at no charge (Valor Econômico, 19 March 2009). Their action was coordinated by APROSOJA-RS, which had just been created. Later, they were joined by rural trade unions from 349 other cities led by FETAGRS (interview with APROSOJA-RS, May 2011). In short, the rural associations claim that the Law of Protection of Cultivars (which allows them to save seeds) should be the only law applied to transgenic seeds. From their perspective, the double application of the Law of Protection of Cultivars and of the Law of Industrial Property – the legal bases of Monsanto's system of royalty collection – is illegal.

In August 2009, Monsanto announced an increase of 26 per cent in the value of royalties charged in the center-west region of the country. APROSOJA-MT threatened to take the issue to court and Senator Gilberto Goellner (Democrats Party) proposed a boycott on transgenic seeds (Valor Econômico, 21 August 2009). Senator Goellner is one of the biggest individual producers of soybean seeds in Brazil and a former president of APROSOJA. He is also a former president of Fundação MT, a private plant breeding company founded by 23 seed producers that started out by supporting research conducted at EMBRAPA but later became independent. In 2003, while legalization of RR soybeans was being disputed, Fundação MT and

Monsanto signed an agreement for the commercialization of soybean varieties developed by the former but containing the RR gene provided by the latter. The agreement had to be approved by the Administrative Council of Economic Defense (*Conselho Administrativo de Defesa Econômica* – CADE), the agency of the federal government that regulates competition. The contract was approved in 2006 under the condition that clauses preventing Fundação MT from researching and commercializing seed technology that could compete with those provided by Monsanto were removed from the contract (CADE 2011). This decision highlights the impact of Monsanto's demands on local actors and how excessive IP protection can actually stifle innovation.

This sequence of controversies attracted the attention of members of the Parliament. In 2009, Congressman Nazareno Fonteles requested a public hearing at the Committee of Agriculture of the Chamber of Deputies to discuss the issue. The meeting was held on 15 September of that year with the participation of representatives from Monsanto, the SNPC/Ministry of Agriculture, ABRASEM, APROSOJA-RS, APROSOJA-MT and associations of soy growers from other states. In her speech at the hearing, Daniela Aviani, representative of the Ministry of Agriculture, stated that the government had decided not to interfere in agreements that had been reached by private actors, since rural producers had agreed to pay for the use of the RR technology (a version that, as mentioned before, is highly contested by organizations of rural producers). She also defended the double application of the Law of Protection of Cultivars and of the Law of Industrial Property and mentioned that changes in the former had been proposed by the ministry (Câmara dos Deputados 2009: 16–18).

The presentation given by APROSOJA-RS at the hearing consisted of a series of slides showing the evolution of prices and production costs faced by soy growers with a single sentence among the concluding remarks mentioning that foreign control of technology represented a threat to national sovereignty. As has been typical of organizations representing Brazilian soy growers, the distributional implications of IP rights were emphasized while broader issues that could draw the support of other actors, such as national or food sovereignty, appeared only as an afterthought. In the words of the leaders of FARSUL, the seed industry is the basis of the production chain, providing new materials with a 'cost that should be paid for.

It is the cost-benefit relationship that matters for the rural producer' (interview, May 2011).

Some members of the Committee of Agriculture – such as Congressmen Luis Carlos Heinze (Progressist Party), Valdir Colatto (Brazilian Democratic Movement Party) and Waldemir Moka (Brazilian Democratic Movement Party) – expressed their sympathy for the cause of soy growers and concern with abuses practiced by Monsanto (Câmara dos Deputados 2009: 16–18). According to APROSOJA-RS, however, these statements were merely rhetorical and did not result in any concrete action in favor of rural producers (interview, May 2011). For Congressman Nazareno Fonteles, if a solution favorable to rural producers is not reached in the judiciary, a change in legislation might be needed, although he feared that, if legislation is brought to discussion, it risks being modified to favor Monsanto even more (Estadão, 15 September 2009).

In November 2009, an unexpected opportunity made it seem like rural producers would finally have their claims heard. In that month, the WTO authorized Brazil to retaliate against the US in compensation for subsidies given by the US government to American cotton producers in disagreement with international rules. According to the WTO's ruling, the retaliation could take the form of suspension of royalty payments made to US companies and did not have to be restricted to the cotton industry. The Brazilian government prepared a bill authorizing the suspension or extraordinary taxation of remittances of royalties made by US companies. In February 2010, a presidential decree regulating the retaliation procedure was issued and, a month later, Congressman Beto Faro presented a bill determining that, if retaliation actually took place in the form of suspension of royalty payments, priority should be given to the suspension of royalties on seeds (Faro 2010b). While the legislation was still under discussion, APROSOJA-MT expressed its disagreement with Congressman Faro. According to the organization, 'it would not make sense to retaliate against Monsanto in a case involving cotton' and such a measure 'would discourage foreign investment' (interview with APROSOJA-MT, June 2011). In contrast, one of the leaders of APROSOJA-RS defended the breaking of patents by the state 'just like it has been done in the case of pharmaceuticals' (interview with APROSOJA-MT, May 2011). In June 2010, Brazil and the US arrived at an agreement according to which the US government

would compensate Brazilian cotton producers with annual payments of US\$147 million for as long as its subsidies to American cotton production are in place (Estadão, 17 June 2010).⁴ By abstaining from retaliating against American IP rights, the Brazilian state missed an opportunity that would have probably been much welcomed in Argentina. However, as stated by Richardson (2009: 253), ‘politics in Brazil may be less shaped by soy exports due to their lower share of exports there – roughly 10 per cent, less than half the share in Argentina’. Moreover, soybean agriculture has been a relatively small source of taxes for the Brazilian state, which has exempted exports of primary products from value-added taxes.

Still, in 2010, Congressman Beto Faro presented a bill determining that the Law of Protection of Cultivars is the only law regulating IP rights on seeds (Faro 2010a). The proposal also states that royalty values should be decided collectively between national organizations representing rural producers, workers and seed companies. This would make the Brazilian pattern of IP rule-making in soybean agriculture more similar to the corporatist pattern that prevails in Argentina, which, as shown in Chapter 2, has benefited rural producers. In his justification for the proposal, Congressman Faro mentioned the conflicts between rural producers and Monsanto and the arguments raised by the attorney representing APROSOJA-RS in the lawsuits (Faro 2010a). The bill is still being discussed along with those authored by Congressmen Moacir Michelletto and Rose de Freitas, which relate to the Law of Protection of Cultivars.

On 4 April 2012, a judicial ruling of the first level issued by Judge Giovanni Conti in Rio Grande do Sul in response to the lawsuit started by APROSOJA-RS determined the suspension of royalty payments on RR soybeans. According to the ruling, following UPOV 1978, the only IP law that could regulate the relation between Monsanto and soy growers is the Law of Protection of Cultivars. Thus, Monsanto did not have the right to charge royalties on the total output sold by rural producers and the latter have the right to cultivate saved seeds at no cost. Based on a technical examination ordered by the court, the judge also concluded that the patents on which Monsanto has based its claims had expired in Brazil (Conti 2012). Ruling out the double application of patents and plant breeders’ rights in the transaction between rural producers and seed companies is a decision that had been previously contradicted by a sentence

from a higher court (Bernardi 2009). However, the understanding that Monsanto had been charging royalties based on expired patents was a major finding in favor of soy growers.

In September 2012, the Federation of Agriculture and Livestock of Mato Grosso (*Federação da Agricultura do Mato Grosso – FAMATO*) started a lawsuit against Monsanto based on a technical examination that concluded that Monsanto's patents on the RR and RRbt technologies had expired in 2010 and, therefore, were in the public domain. The organization also demanded from Monsanto a refund of royalties paid after the expiration in double amount. APROSOJA-MT strongly supported the action but also acknowledged that

investments in research, especially in biotechnology, are crucial to sustain the competitiveness of Brazilian agriculture. These are the investments that must increase productivity per area, reduce production costs and give more sustainability to the production system. In the face of this ... we clarify that we are in favor of royalty payments. However, we defend that their charging should be fair and supported in the Brazilian patent legislation.

(APROSOJA-MT, 31 January 2013)

This statement shows once more that the mobilization of Brazilian rural producers is oriented to distributional aspects of IP (the balance between R&D investments, productivity gains and royalty costs) and tamed by transnational competition for foreign technology. The first rulings issued on the lawsuit were favorable to APROSOJA-MT (APROSOJA-MT, 31 January 2013).

In February 2013, the Brazilian Superior Tribunal of Justice decided on a lawsuit between Monsanto and the Brazilian National Institute of Industrial Property (*Instituto Nacional de Propriedade Industrial – INPI*) over the expiration of patents on the RR technology. The INPI had declined Monsanto's requests to extend the patent and was supported by the tribunal, which argued that the patents expired in 2010, consistent with the claims of soy growers (Superior Tribunal de Justiça, 21 February 2013). Monsanto has suspended the charging of royalties on RR soybeans in Brazil until a final judicial sentence is issued. The company is questioning the constitutionality of elements of the Law of Industrial Property on which the decision on the expiration of patents was based (CISOJA, 21 May 2013).

Since it is constitutional matter, it needs to be considered by the Brazilian Supreme Court. Instead of paying royalties to Monsanto, rural producers started to make deposits in a provisional judicial account.

In response to the judicial defeats, Monsanto once again applied the strategy of 'divide-and-conquer'. In January 2013, the company was already negotiating an agreement with CNA and five rural associations of state level to

strengthen the recognition of IP rights over technologies applied in agriculture as well as the proper financial compensation to the owners of those technologies at each use of certified and/or saved seeds, including the possibility of conducting tests to detect the presence of those technologies.

(Monsanto et al. 15 January 2013, author's translation)

The parties referred to the need for future investments and for compensation of investments already made with the goal of assuring the influx of new technologies capable of increasing the productivity of Brazilian soybean agriculture (Monsanto et al. 15 January 2013). In the agreement, Monsanto committed to permanently cancel the charging of royalties on RR soybeans *only for producers that accept the terms of individual agreements that would reflect the understanding reached with CNA* (thus assuming that it would win the lawsuits, regain the right to charge royalties but then voluntarily exempt soy growers that abide the agreement). The content of the understanding was a backlash in relation to everything that had been achieved by APROSOJA in the Brazilian courts. It reflected an attempt by Monsanto to co-opt rural associations not involved in the lawsuits and inclined to accept stronger IP terms because of competition for technology.

However, when Monsanto actually started to present contracts for individual soy growers, CNA realized that they included clauses about the licensing of the RRBt technology, a GM variety that had not even started to be commercialized. In the contracts, rural producers recognized that patents on RR soybeans were valid until 2014, implying that the cancellation of royalty charges was virtually just a favor offered by Monsanto. Soy growers would also have to renounce any previous legal demands regarding Monsanto's IP and accept

the possibility of royalties being charged on the sale of harvests. CNA reacted with rage, stating that rural producers should not sign such contracts and demanding the annulment of contracts already signed (*Revista Globo Rural*, 20 February 2013).

In July 2013, Monsanto's attempt to co-opt soy growers was partly effective. In exchange for a 16 per cent discount on royalties to be paid on RRBt soybeans over the next four years, FAMATO decided to quit its lawsuit against Monsanto (G1, 24 July 2013). The decision was supported by APROSOJA-MT and was made behind closed doors by the organizations' leadership, comprised mostly of large rural producers. The 'benefit' will be extended to any Brazilian soy grower who signs a contract with Monsanto submitting to rules about the use of RRBt soybeans and repudiating mutual obligations related to the RR technology. Although the contract could be seen as a compromise in which soy growers obtained a discount because of their partially successful efforts in courts, it was a short-term gain at the expense of the long-term rights of farmers as users of IP-goods. It also confirms that Brazilian soy growers – those linked to APROSOJA-MT in this instance – are more concerned with the distributional implications of IP rights (royalty values) than with their substantive nature as legal rights. Individual soy growers could still sue Monsanto for royalties, but they will no longer have the backing of APROSOJA-MT (*Reuters*, 09 August 2013).

The agreements between Monsanto, FAMATO and APROSOJA-MT were criticized by other associations, including APROSOJA-RS (*Notícias Agrícolas*, 26 July 2013). If the Brazilian Supreme Court finally decides in favor of APROSOJA-RS, soy growers (after being unsuccessful in their claims to the executive and legislative powers) will finally obtain a favorable solution to their problems from the branch of the state that, in spite of its slowness, enjoys some bureaucratic isolation from external interests (including those of seed companies): the judiciary. The victory of APROSOJA-RS could be a watershed in the mobilization of rural producers around IP. According to the director of the Secretariat of Agriculture, Livestock and Agrarian Development of the state of Tocantins, Corombert de Oliveira, the judicial defeat of Monsanto could generate in rural producers the perception of victory over large conglomerates based on their collective mobilization: '[the favorable rulings in lower courts] were a result of the mobilization

of producers and not only of the decision of a judge' (CISOja, 19 November 2012, author's translation).

In parallel to these conflicts over legislation, the Ministry of Agriculture increased control of the seed market to avoid piracy. In 2002, 85 per cent of the area cultivated with soybean seeds in Brazil had been sowed with certified seeds (data from ABRASEM), a value much higher than the equivalent estimates for Argentina and Paraguay (see chapters 2 and 4, respectively). In 2010–11, the use of certified seeds corresponded to 64 per cent (data from ABRASEM), which is still very high for regional standards. According to an official from the Ministry of Agriculture, this is explained by a growing effort on the part of the state to fight piracy (APROSMAT, 12 September 2011). From 2008 to 2010, the number of inspections rose from 16,055 to 20,018; the number infractions detected went from 803 to 929 and the average amount of pirate seeds confiscated annually was 8,800 tons (APROSMAT, 12 September 2011).

In the absence of an effective and favorable response from the executive and legislative powers, and without a final decision from the judiciary, soy growers turned to EMBRAPA. Their goal was not to promote changes in legislation but to increase competition in the market for soybean seeds, ultimately driving seed prices down. As stated by the president of APROSOJA-RS, Pedro Nardes, at a public audience at the Brazilian Chamber of Deputies in September 2009, 'the hegemony of the private sector in R&D may be catastrophic for national sovereignty. The state needs to invest in agricultural technology to give the country autonomy to produce on a large scale' (Nardes 2009, author's translation). For FARSUL, it is vital to guarantee competition between seed companies and the role of EMBRAPA is fundamental to avoid monopolistic situations (interview, May 2011).

In 2009, APROSOJA-MT had already started a collaborative project with EMBRAPA and the Brazilian Association of Producers of Non-Genetically-Modified Grains (*Associação Brasileira de Produtores de Grãos Não-Geneticamente Modificados* – ABRANGE) to develop non-GM varieties of soybeans that could compete with those provided by Monsanto. According to sources from APROSOJA-MT and ABRANGE, there were indications that Monsanto had been encouraging local seed multipliers to reduce the proportion of non-GM seeds produced (interviews, May–June 2011). If this perception is accurate, the

steady increase observed in the area cultivated with RR soybeans in Brazil since the mid-1990s would not be solely the result of rational economic decisions made by rural producers but also a product of Monsanto's marketing strategies and demands on local seed producers.⁵ For this reason, in 2010, the Association of Seed Producers of Mato Grosso (*Associação dos Produtores de Sementes de Mato Grosso* – APROSMAT) cancelled its affiliation to ABRASEM, arguing that this organization was excessively subordinated to Monsanto (interview with APROSOJA-MT, June 2011). More importantly, APROSOJA-MT, ABRANGE and EMBRAPA launched the project mentioned above with the suggestive name of *Soja Livre* ('Free Soy'). The initiative has been successful in the state of Mato Grosso, the leading soybean producing area of the country, where around 40 per cent of cultivated soybeans were still non-GM by 2011 (interview with EMBRAPA Soja, June 2011). Today, there are plans to expand the project to other states and to include varieties of corn (interview with EMBRAPA Soja, June 2011). Thus, a strong public agricultural R&D agency provided rural producers with a strategy for overcoming the power of transnational corporations as an alternative to legislative or judicial measures to assure the right to save seeds.

Soy growers would benefit not only from EMBRAPA's capacity to develop non-GM varieties of soybeans but also from the company's programs with transgenics. In June 2013, the Chinese government finally authorized the import of the GM soybean variety that had been jointly developed by EMBRAPA and BASF. Marketed under the brand name 'Cultivance', this is the first GM crop developed in Brazil from laboratory to commercialization. The new variety is resistant to the broad class of imidazolinone herbicides and will compete with the glyphosate-resistant varieties provided by Monsanto.

In the mid-2000s, EMBRAPA initiated an expansion that would sustain its prominent role in the local seed industry for another decade. In terms of budget, the recovery started around 2004 (EMBRAPA 2011) and got a significant push in 2008, when President Lula announced PAC EMBRAPA – the Program of Strengthening and Growth of EMBRAPA. This was part of a broader program launched by the federal government to stimulate economic growth through increasing public investment and greater intervention of the state in the economy – the Program of Acceleration of Growth (*Programa de Aceleração do Crescimento* – PAC). By 2010, EMBRAPA had already

received R\$914 million (then equivalent to over US\$ 500 million) (EMBRAPA Informação Tecnológica 2009). This meant a real increase of around 70 per cent in the agency's budget over a decade. By 2011, EMBRAPA had 9,506 employees (2,061 with doctoral degrees) and an annual budget equivalent to 1 billion dollars (Teixeira 2011: 5). EMBRAPA Soja has received significant amounts from PAC EMBRAPA. A large part of the resources has been invested in capacity building in biosafety to help the agency manage research with transgenic plants (interview with EMBRAPA Soja, June 2011). Another sign of the agency's strength was a new law in 2011 that authorized EMBRAPA to directly operate in foreign countries without the need to establish cooperative projects with foreign institutions.

Thus, in spite of increasing investment by transnational corporations in the Brazilian seed industry, 'EMBRAPA is still responsible for a large portion of the market for...seeds' and 'To some extent,...competes with private industry for some types of seeds.' (Morin 2010: 4). As pointed out by Carvalho et al. (2007: 14), the public research sector continues to be central in the process of releasing and protecting new cultivars. 'The process of privatization and denationalization of the seed industry, in spite of having taken place in some fronts, was not generalized. On the contrary, national presence is still remarkable and prominent' (Carvalho et al. 2007: 14, author's translation).

Soy growers have continued to demand stronger participation of the state in the provision of technology. In November 2011, Senator Blairo Maggi, one of the biggest soybean producers in the world and former governor of Mato Grosso, gave a speech at the Senate stating that EMBRAPA needed even more public investment because

It is thanks to EMBRAPA and to the vision of the previous government [President Lula] that we have moved forward. We have to give EMBRAPA not only some millions of reais. We are not talking of millions, but of billions of reais, so that EMBRAPA is able to confront the big transnational corporations.

(CISOja, 28 November 2011, author's translation)

Despite the recent accomplishments of soy growers, the conflicts analyzed above made visible the limits of the mobilization of soy growers as knowledge-users. First, the public discourse of

APROSOJA-MT and APROSOJA-RS has been highly focused on the allegedly abusive royalties charged by Monsanto and on their contested legality. Rarely have attempts been made to link soy growers' demands to broader issues, such as national or food sovereignty. These links could give birth to a broader coalition against Monsanto. Questions of sovereignty have been brought up mostly by CONTAG or MST, which are not key actors in the disputes about IP involving the corporation. There is no collaboration between APROSOJA-RS, APROSOJA-MT and NGOs or rural social movements that contest private IP rights on seeds (interviews with APROSOJA-MT, APROSOJA-RS and ASPTA, May–June 2011). The only exception is the collaboration between APROSOJA-RS and FETAGRS, a member of CONTAG, in Rio Grande do Sul.

In addition, there is no organization of national scope representing soy growers in these disputes. The main actors have been organizations at state-level, which diverge in approach. During his presentation at the hearings of the Committee of Agriculture of the Chamber of Deputies, the president of APROSOJA-RS stated that the organization tried to mobilize FARSUL and CNA in defense of their interests before taking action against Monsanto. Neither of these, however, actually joined the organization in its judicial battle against the corporation (interview with FARSUL, May 2011). APROSOJA-RS also claimed that nationally APROSOJA has a yielding approach to seed companies, whereas APROSOJA-RS defends a more radical stance (interview May 2011).

These differences are partly explained by the different material conditions that affect soy growers in different states. In Mato Grosso, the use of RR soybeans is proportionally smaller because of technical reasons and the scale of production is larger. This means lower production costs in comparison to farming in Rio Grande do Sul, where small and medium properties predominate and virtually all production is transgenic. The fact that APROSOJA-RS and APROSOJA-MT have launched lawsuits against Monsanto individually and with different claims is a sign of the divisions. Even more significant is the fact that soy growers from Mato Grosso later quit their lawsuit in exchange for discounts offered by Monsanto on royalties to be paid on RRBt soybeans. The resulting weakness seems to be recognized by some rural leaders. In the state of Minas Gerais, the president of the Rural Trade Union of Unaí and largest producer of soybeans

in that state, H lio Oscar Machado, stated that a stronger coordination of rural trade unions and federations of the rural sector is needed to respond to the pricing policy of Monsanto (Hoje em Dia, no date).

Incapable or unwilling to create a national coalition against Monsanto, soy growers have been even less successful in creating an international coalition of rural producers around IP issues. In January 2010, APROSOJA-MT met with the Association of Soy Growers from Illinois to, among other things, exchange information about royalty payments (APROSOJA-MT 2010). Both associations are members of the International Soy Growers Alliance (ISGA), which brings together soy growers from Argentina, Brazil, Paraguay, Uruguay and the US. In May of the same year, the president of APROSOJA mentioned that rural producers were organizing a 'global front of resistance' against Monsanto with soy growers from Argentina and the US (CISOja, 25 May 2010). So far, however, the project is just an idea. The only effective transnational collaboration between soy growers on IP issues emerged in late 2012 between APROSOJA-RS and Paraguayan soy growers, after the former obtained provisional victories against Monsanto in one of the lawsuits mentioned before. Because it involves Paraguayan soy growers, this collaboration will be discussed in the next chapter.

Lastly, APROSOJA-RS and APROSOJA-MT, the main actors in direct disputes with Monsanto, are young organizations established only in the late 2000s. As such, they did not accumulate political experience or legal expertise through participation in the policy-making of the Law of Protection of Cultivars and of the Law of Industrial Property.

Conclusion

Since its creation in the 1990s, the Brazilian IP regime on seeds has changed consistently with the global trend toward stronger IP. Changes in legislation and new enforcement practices increased the scope and strength of private IP on plant varieties. On top of the national IP regime, Monsanto was able to implement a large-scale private system of royalty collection based on private agreements and on Brazilian patent law. As we shall see in the next chapter, the system was actually a transnational extension of a mechanism originally implemented in Paraguay. Its operation in Brazil

has been contentious and its legality contested. For years it has allowed Monsanto to appropriate several million dollars from soy growers in royalty payments. Overall, the situation that resulted from the intertwined trajectory of international, transnational and national IP regimes in Brazilian soybean agriculture resembled a neodevelopmental IP model that tries to balance incentives for innovation by local firms with access to technology by local knowledge-users. As argued in this chapter, this was a result of the following factors.

Relations between the state and knowledge-users

The Brazilian state has not effectively responded to the demands of soy growers regarding IP. While the Ministry of Agriculture initially declared support for the Argentine government in the conflict with Monsanto, domestically it had been promoting reforms to make the Brazilian IP regime more restrictive. When conflicts between Brazilian rural producers and Monsanto became acute, the ministry assumed a position of non-interference. On the part of the judiciary power, lawsuits started by organizations of rural producers are still waiting for final decisions. Monsanto has been the main beneficiary of the slowness of the judicial process. The Brazilian National Congress has been ambiguous. While some representatives proposed legislation to make the Brazilian IP regime even more restrictive, others reacted defensively proposing changes in the opposite direction.

The economic and institutional links between the state and soy growers can partly explain this outcome. In spite of the growing importance of agribusiness in Brazil since the mid-1990s, soy growers never came to occupy the central political and economic role that Argentine or Paraguayan soy growers did in their respective countries. The National Committee for Protection of Cultivars, whose creation was determined by the Law of Protection of Cultivars, never became a reality. The committee could have served as a stable institutional link between rural producers and the state for the communication of demands regarding IP. Instead, matters affecting the seed industry keep being discussed intermittently in a series of committees with the presence of different interest groups, a fragmented and fluid negotiation process resembling a pluralist pattern of rule-making.

Competition in the provision of technology

The Brazilian state is by far the biggest public investor in agricultural R&D in Latin America. EMBRAPA is a world leader in tropical agriculture that survived the challenges posed by neoliberal reforms. Today, the agency operates internationally and even exports technology to other developing countries. In the early 1990s, EMBRAPA endorsed a law recognizing IP rights on plant varieties because of coercion associated with international treaties signed by the Brazilian state. Since then, EMBRAPA's increasing technological capacity and links to the private sector have turned it into an advocate for stronger IP rights. Because EMBRAPA is capable of providing competitive seed technology for rural producers, the right to save seeds has not been as crucial for Brazilian rural producers as it would have been otherwise. When the contestation of the legality of Monsanto's system of royalty collection proved to be difficult, soy growers turned to EMBRAPA to obtain conventional seed varieties that could compete with the GM technology provided by Monsanto.

This has parallels with what happened in the pharmaceutical industry in Brazil after 2003. Since that year, the Brazilian IP regime on pharmaceuticals has become more restrictive as a local pharmaceutical industry with increasing technological capacities has demanded stronger protection for IP (Shadlen 2011). The Brazilian state has been trying to balance access to pharmaceuticals by health patients with incentives for innovation to the local pharmaceutical industry (Shadlen 2011). For this reason, Shadlen (2011) classified the Brazilian IP regime on pharmaceuticals as 'neodevelopmental'. In the case of plant varieties, EMBRAPA has adapted to a context of stronger IP regimes, increased its technological capacity and intensified links with private seed companies. From being an opponent to private IP rights on plant varieties until the mid-1990s, the agency became an advocate of stronger IP regimes.

Mobilization of knowledge-users

In the 1990s, the mobilization of Brazilian rural producers as knowledge-users was negatively affected by the crisis of political representation that ended up with the hegemonization of agrarian elites by big transnational agribusiness. This happened under the

organizational framework provided by OCB and ABAG. Even within the CNA – the old organization of the national rural bourgeoisie – the seed industry proved to have a stronger voice vis-à-vis rural producers in discussions about IP. Soy growers' mobilization in IP disputes was carried out mostly by APROSOJA-MT and APROSOJA-RS. These organizations, in spite of being very active, have a very recent inception and articulate a public discourse restricted to the distributive implications of IP rights. Moreover, their actions against Monsanto were developed in isolation, without a nationally coordinated program. In the end, APROSOJA-MT quit its lawsuit against Monsanto in exchange for discounts in royalties on new GM soybean varieties. In comparison with Argentine soy growers, the strength of their mobilization has been only moderate.

Lastly, Brazilian soy growers have been vulnerable to transnational competitive pressures that have motivated some of their organizations to make concessions to foreign seed companies in the form of stronger protection for IP. This was manifest during the establishment of Monsanto's system of royalty collection and was also a reason for some setbacks faced by rural producers in their legal fights with the corporation.

The persistence of a neodevelopmental model of IP regulation in Brazil is contingent upon the reproduction of the conditions described above. A victory by soy growers in the lawsuits against Monsanto might boost their mobilization and enable them to halt legislative reforms aiming at making the Brazilian IP regime more restrictive. It would also probably increase their bargaining power in relation to Monsanto in future negotiations about IP on RRBt soybeans. They could either demand better compensation from Monsanto in the form of more investment in local R&D or limit the operation of the company's system of royalty collection. The empowerment of EMBRAPA is also a fundamental underpinning of the Brazilian IP regime that would have to be sustained for the status quo to persist.

4

Paraguay: The Dependent Model

Like Brazil, Paraguay did not have legislation for protection of private IP rights on seeds until the 1990s. The Law of Seeds and Protection of Cultivars was enacted in 1994 to establish protection for IP rights on plant varieties in the form of plant breeder's rights. Like Argentina and Brazil, Paraguay is a signatory of UPOV 1978 and its legislation on plant breeder's rights recognizes the three exceptions also found in Argentine and Brazilian law:

- the right of rural producers to save seeds;
- the right of plant breeders to use existing protected varieties to develop new ones without consent from the original cultivar owner;
- the right of the state to declare the restricted public use of certain varieties in cases of national interest.¹

Paraguay is also a signatory of TRIPS but it was only in 2000 that the state enacted a new law of patents adapted to the new international standards. The law allows patents on transgenic micro-organisms and genes but not on plants and animals as a whole. In addition, from 2004 to 2012, the Ministry of Agriculture issued several rulings imposing restrictions on the right to save seeds. Regarding law enforcement, the use of certified soybean seeds in Paraguay was around 30 per cent from 2005 to 2011, higher than in Argentina but lower than in Brazil.²

Paraguay is also the first country in South America where Monsanto implemented a private system of royalty collection on GM

soybeans, which happened in early 2005. The system, soon extended to Brazil, is based on the charge of royalties on the value of harvests sold by rural producers at trading houses or crushing industries. As in Brazil, soy growers have the option of paying royalties in advance, when purchasing the seeds, and are subjected to inspection activities carried out by Monsanto. In practice, the system eliminates the right to freely save seeds and makes soybean seed piracy innocuous to Monsanto. The negotiation of the private agreement on which the system is based started before the Paraguayan state authorized the commercial cultivation of RR soybeans and in the absence of a patent on the RR technology in the country.

Why has the Paraguayan IP regime on seeds changed so consistently with the global trend toward stronger IP? Why does Monsanto have such a strong grip over the country? Saying that the Paraguayan state and soy growers were weak vis-à-vis Monsanto does not take us very far theoretically and does not help us derive practical policy implications. In this chapter, I show that Paraguayan state agencies and rural producers were very influenced by transnational competition for foreign technology when making decisions about IP. Their concern with losing access to new seed technologies made them vulnerable to demands from seed companies for stronger IP. In addition, although soybean agriculture is the most important sector of the economy in the country, soy growers pay very low taxes in comparison to rural producers in neighboring countries. Because of its limited economic capacity, the Paraguayan state has no organizational or technical resources to formulate IP policy according to national development goals. There are also no stable institutional links between the state and soy growers in IP rule-making. The state is either captured by private interest groups and formulates rules to satisfy their interests or simply abstains from designing rules by emulating foreign legislation or endorsing private IP contracts. The scarce resources available to the state also make it a very precarious source of technology. The provision of seed technology in Paraguay is basically controlled by foreign actors, especially Monsanto. Lastly, the mobilization of soy growers around IP has been led by a young association highly connected with (and constrained by) a small group of organizations that represent seed companies and transnational corporations. This has prevented soy growers from pursuing a radical course of action in the resistance against Monsanto.

Neoliberalism and intellectual property in Paraguayan soybean agriculture (1990s)

In 1991, the Ministry of Agriculture and Livestock created a committee to draft a law that would replace previous standards for the seed market and provide recognition and protection for IP rights on plant varieties. This committee was composed of representatives from the public and private sectors involved in the seed market and worked with experts from FAO and INASE (SENAVE 2009: 50). Carmen Gianni, INASE's IP coordinator, was one of the drafters of the bill (interview with APROSEMP and PARPOV, Asunción, March 2011). The legal director of the Ministry of Agriculture and Livestock and officials from the Ministry of National Integration were also consulted during the elaboration of the legislation (SENAVE 2009: 50). Neither Brazil nor Argentina had their legislation on plant breeder's rights directly drafted by a foreigner, which demonstrates the weak capacity of the Paraguayan state in IP policy-making.

The committee took into account not only existing Paraguayan law but also foreign and international law, especially that of neighboring countries with which Paraguay had regional treaties (SENAVE 2009: 50). Their concern was to facilitate access to foreign markets by Paraguayan seeds (SENAVE 2009: 50). In the exposition of motives for the new legislation, which was attached to the bill, the committee mentioned the Treaty for Liberalization and Expansion of the Regional Trade of Seeds of the Association for Latin American Integration as well as the Treaty of Asunción, the accord that created MERCOSUR (SENAVE 2009: 45–6). The UPOV conventions were also mentioned but with the acknowledgment that at that point Paraguay was not yet a signatory of any of the organization's acts (SENAVE 2009: 49).

In the exposition of motives, the committee stated that its goal was to provide a law that balanced the interests of plant breeders, seed traders and rural producers, creating a stimulating environment for seed companies to invest in R&D and giving rural producers access to high quality seeds that would increase the productivity of national agriculture (SENAVE 2009: 45). Therefore, the work of the committee consisted of trying to satisfy the demands of distinct interest groups within the constraints posed by the regional seed market and international law. Unfortunately, there are no public records available

about the work of the committee or of debates about the bill in the Parliament.

On 11 August 1994, the bill resulting from the work of the committee was finally sanctioned by President Wasmosy giving birth to the Law of Seeds and Protection of Cultivars. As one more sign of the reflective nature of the Paraguayan legislative process, the title given to the law merged the titles of the 1973 Argentine law of seeds and of the Brazilian legislation that was still under formulation but that would be sanctioned in 1997. The resemblance was not only in the title. The substance of the three laws is very similar. In short, the plant breeders' rights with aforementioned exceptions found in Paraguayan law are also found in Argentine and Brazilian law. These exceptions were established by Paraguayan lawmakers to prevent the emergence of monopolies that could negatively affect agriculture and consumers, the continuity of plant breeding research and biodiversity (SENAVE 2009: 53).

The law also created the National Council of Seeds (*Consejo Nacional de Semillas*), following the model of the Argentine CONASE, to advise the Ministry of Agriculture and Livestock in matters regarding the seed industry. The council was to be made up of five state representatives involved in regulating the seed market or plant breeding and five representatives from the private sector (from associations of rural producers, seed traders, seed companies and plant breeders). However, in a sign of the institutional weakness of the Paraguayan state, the council never became a reality. This failure was related to the overall weakness of the Paraguayan state and to the deterioration of governability that, according to Brun (2010: 69), characterized Paraguay in the 1990s. Today the country still lacks a formal site for discussion of standards relating to the seed industry (interviews with APROSEMP, PARPOV and SENAVE, Asunción, March 2011).

In 1996, the Congress ratified UPOV 1978 through Law 988. Since the Law of Seeds and Protection of Cultivars was already in conformity with this treaty, its formal ratification did not imply substantive changes to legislation. Thus, as Argentina and Brazil, Paraguay avoided the deadline after which the country would have to adhere to the UPOV convention of 1991.

In spite of the passing of the Law of Seeds and Protection of Cultivars and of the adhesion to UPOV, IP rights on plant varieties were not effectively protected until March 2000, when regulation of

the law took place with Decree 7797. In short, the decree established the organizational apparatus for the enforcement of the law, including specification of the membership of the National Seed Council, which from then on would assume the acronym of CONASE (the same as its Argentine equivalent). The council would be composed of five state representatives and one representative from each of the following organizations: the Federation of Cooperatives of Production (*Federación de Cooperativas de Producción* – FECOPROD), the Association of Seed Producers of Paraguay (*Asociación de Productores de Semillas del Paraguay* – APROSEMP), an organization of seed traders, an organization representing plant breeders and an organization representing rural producers (the National Society of Agriculture (*Sociedad Nacional de Agricultura*), the National Agricultural Union (*Unión Agrícola Nacional*) or another organization appointed by CONASE). Even after this specification, the council was never constituted in reality. Once the decree was enacted, the first protected varieties were registered in 2002 (interview with SENAVE, Asunción, March 2011).

In the late 1990s, a new law of patents was also prepared. In 1993, the creation of a new patent law had already been mentioned in a government plan of structural adjustment supported by the Inter-American Development Bank (Brun 2010: 63). However, it was only in November 2000 that a new law of patents was approved (*Ley de Patentes de Invención*, n. 1630/2000). The law allows patents on transgenic micro-organisms and genes but not on whole plants or animals.

Reforms to the Paraguayan intellectual property regime on seeds and the contentious operation of Monsanto's system of royalty collection (2000s)

Regulating the right to save seeds

As in Argentina and Brazil, attempts have been made in Paraguay to restrict the right of rural producers to save seeds. Such measures have been demanded by seed companies and opposed by rural producers (interview with SENAVE, Asunción, March 2011). The first official attempt to curtail the right to save seeds was a resolution issued by the Ministry of Agriculture and Livestock in November 2004 (Resolution 1.471). This limited the right to save seeds only to rural

producers that cultivate legally acquired seeds or seeds originating from those. It also determined that saved seeds must be used only within the rural producer's own rural establishment and must not be exchanged or used in association with other rural producers or organizations. This resolution is very similar (and in many parts literally identical) to Resolution 35 issued by the Argentine INASE in 1996. As stated in Chapter 2, this standard was strongly criticized by Argentine rural associations because of its bias against farmers that do not own the land they use (tenants) and small rural producers that need to store seeds outside their own facilities. Probably for this reason, the Paraguayan Ministry of Agriculture and Livestock decided to amend Resolution 1.471 only one month after its enactment. Through Resolution 1630, the ministry allowed rural producers to use saved seeds not only in their own establishments but also where they are tenants. This was exactly the same change that Argentine rural producers had demanded from INASE regarding Resolution 35. These short term changes and the emulation of Argentine legislation indicate once more the weak capacity of the Paraguayan state in IP matters.

Still, in 2004, the National Service for Plant and Seed Quality and Health (*Servicio Nacional de Calidad y Sanidad Vegetal y de Semillas* – SENAVE) was created as an agency under the Ministry of Agriculture and Livestock for the regulation of biotechnology, biosafety and IP on plant varieties. In 2007, SENAVE issued Resolution 669 restricting the right to save seeds specifically in soybean agriculture:

- only the first generation of seeds originating from the cultivation of legally purchased seeds could be saved;
- the area cultivated with saved seeds could not exceed 300 hectares;
- at least 15 per cent of the cultivated area must be sowed with new certified seeds.

In March 2010, SENAVE issued Resolution 171 canceling the quantitative limitations imposed by Resolution 669. The document enacting Resolution 171 stated that the regulation of the right to save seeds should not be specific to only one crop because it would be discriminatory. Sources from APROSEMP stated that the overturning of the limitations resulted from pressure from a leader of soy growers that had connections with the government (interview, Asunción,

March 2011). These sources, however, pointed out that resolutions from SENAVE are commonly issued unilaterally and depending on the 'political position' of its director. These two statements are apparently contradictory but – together with the absence of a corporatist committee for rule-making – they suggest that SENAVE is a weak state agency effectively controlled by private actors.

Resolution 171 also stated that standards regulating the right to save seeds should be analyzed jointly by all sectors involved in the matter. It called for the creation of a committee to formulate new regulations on the right to save seeds. SENAVE created an internal working group to draft new standards but it included no formal participation of the private sector (interview with SENAVE, Asunción, March 2011). Organizations such as APROSEMP, the Paraguayan Association of Plant Breeders (*Asociación Paraguaya de Obtentores Vegetales* – PARPOV) and organizations of rural producers were consulted on an occasional basis (interview with SENAVE, Asunción, March 2011). PARPOV was founded in 2006 to represent mostly transnational seed companies and was a sign of the increasing presence of foreign capital in the Paraguayan seed industry. Even the Paraguayan Institute of Agricultural Technology (*Instituto Paraguayo de Tecnología Agrícola* – IPTA) does not participate in the elaboration of such standards (interview with IPTA, Asunción, March 2011). Founded in 2010, IPTA centralized R&D activities previously conducted in different divisions of the Ministry of Agriculture and Livestock. This ad hoc process shows the persistently weak organization of IP policy-making.

In April 2012, SENAVE finally issued Resolution 355 establishing the following restrictions on the right to save seeds:

- only the first generation of seeds can be saved;
- the area cultivated with saved seeds is limited to amounts that vary according to crop (for soybeans, the limit is 100 hectares sowed with a maximum of 80kg of seeds per hectare).

It also imposed rules on the manipulation and storage of saved seeds. According to the Agricultural Coordination of Paraguay (*Coordinadora Agrícola del Paraguay* – CAP), an organization of rural producers, the resolution harms rural producers to the benefit of 'opportunistic seed companies and unscrupulous state officials' (ABC Color, 29 April

2012), an indication of state capture that limited the influence of farmers over the Paraguayan IP regime.

The enforcement of existing standards, however, remains limited. Sources from the Inter-American Institute for Cooperation on Agriculture (IICA) indicate that small rural producers usually do not even know what they are (interview, Asunción, March 2011). According to sources from SENAVE, control exists but is difficult (interview, Asunción, March 2011). SENAVE has approximately 500 employees, around 60 per cent of which are located in Asunción, so only 40 per cent can be directly involved in control activities in the countryside (interview with SENAVE, Asunción, March 2011). In reaction to this, APROSEMP and PARPOV asked Senator Herminio Chena Valdéz (*Unión Nacional de Ciudadanos Éticos*) to propose a change to the Law of Seeds and Protection of Cultivars that would restrict the right to save seeds (interview with APROSEMP and PARPOV, Asunción, March 2011). In December 2010, Senators Herminio Chena and Fernando Silva Facetti (Liberal Radical Authentic Party) proposed a bill in the Congress allowing only small rural producers to save seeds (Chena and Facetti 2010). In the explanation of their motives, the senators quoted a book edited by Miguel Rapela (2006), former president of ASA – one more sign of the influence of the neighboring country (Chena and Facetti 2010). The proposal has not yet been approved. According to APROSEMP and PARPOV, ideally all seed companies would have their IP rights compensated by payments on the output of grains as opposed to royalties paid at the purchase of seeds (interview, Asunción, March 2011). Seed companies in Paraguay were also working on the creation of a system of extended royalties modeled on the one in place in Argentina (interview with APROSEMP and PARPOV, Asunción, March 2011).

The agreement with Monsanto

While standards restricting the right to save seeds were being formulated within the state, a private IP agreement was being negotiated between Monsanto and organizations of Paraguayan agribusiness. The agreement established a private system of royalty collection for RR soybeans based on the charge of royalties on the harvests sold by rural producers, which eliminated the right to save seeds without paying royalties. The system was based solely on a private contract because Monsanto did not hold a patent on the RR technology in

Paraguay. Monsanto based its demands on patents held in other countries, which – as demonstrated in the judicial dispute between Monsanto and Argentina in European courts – was not a valid claim. In the absence of a patent and of a final government regulation on the right to save seeds, Monsanto was able to implement a private IP regime, demonstrating the power of transnational corporations to set standards and norms applying to their own transactions.

The history of Monsanto in Paraguay started in 1998, when the Ministry of Agriculture and Livestock authorized the company to conduct the first field trials with RR soybeans in the country. In the following year, the subsidiary firm Monsanto Paraguay S.A. was formally registered. In 2011, Monsanto opened an experimental station in Santa Rita (in the department of Alto Paraná), which serves as its base for breeding operations and manipulation of seeds from Argentina and Brazil. During the late 1990s, RR soybean seeds had been smuggled into Paraguay from Argentina. Approval for the commercial cultivation of RR soybeans in Paraguay was closely linked to the Brazilian policy for GM organisms (Yakelevich 2010: 5). As pointed out by representatives from APROSEMP and PARPOV, Paraguayan authorities feared that once Brazil authorized the cultivation of RR soybeans, it would be hard to control the influx of RR seeds into the country (interview, Asunción, March 2011). On the other hand, if Brazil did not authorize the cultivation of RR soybeans, it would no longer be possible to export GM production from Paraguay through Brazilian ports (interview with APROSEMP and PARPOV, Asunción, March 2011). Again, Paraguayan policy was derivative of developments in Argentina and Brazil.

The approval of RR soybeans by the Paraguayan state came only in 2004 during the administration of President Nicanor Duarte Frutos (2003–08). To obtain the government's approval, organizations representing agribusiness worked alongside members of the Congress and the press to convince the government and society of the benefits of agricultural biotechnology (interview with CAPECO, Asunción, March 2011). When the authorization was issued, the minister of agriculture was Antonio Ibáñez, himself a soy grower (interview with CAPECO, Asunción, March 2011). The regulatory framework for the approval of GM organisms in place in the country was designed in cooperation with the Argentine government (interview with INBIO, Asunción, March 2011). The authorization

for commercial cultivation of RR soybeans came at the imminence of the agreement between Monsanto and soy growers on IP. When the press announced that an agreement was close (La Nación (Py), 24 September 2004), Minister Ibáñez declared he had been waiting for the private actors to reach an agreement to sign the authorization (La Nación (Py), 24 September 2004). Instead of having the state issuing standards to which the private sector adapts, in Paraguayan soybean agriculture it was the state who abstained from participating in the negotiations and adapted to norms established by private actors.

Although Paraguayan soy growers were the first to give up the right to freely save seeds in favor of Monsanto, reaching an agreement with the corporation was not quick and easy. In the negotiations with the company, Paraguayan soy growers were constrained by the weakness of the local seed industry and by the control of the provision of seed technology by foreign actors. Local soy growers were therefore very vulnerable to transnational competition for foreign technology, a vulnerability rooted in their own refusal to sustain viable public agricultural R&D programs through taxes.

The presence of transnational seed companies in Paraguay grew significantly in the 2000s. Besides Monsanto, Pioneer, Syngenta and DOW had also entered the local seed market. Unlike Monsanto, these companies concentrated their activities in GM maize (interview with INBIO, March 2011). As in Argentina and Brazil, many local seed companies were either acquired by foreign corporations or established agreements with them to use their transgenic technology in cultivars adapted to local conditions. For instance, in December 2010, Syngenta acquired Agrosan, a local company for distribution of seeds and agrochemicals, in a deal worth over US\$ 120 million (La Nación (Py), 30 December 2010). The number of seed companies that were actually local was very small. Even plant breeding companies (those that do not work with genetic engineering) were mostly from Argentina and Brazil (interview with INBIO, Asunción, March 2011). In the case of soybeans, in 2011 there were around ten companies providing cultivars for Paraguayan soy growers and most of them were foreign (Nidera, Relmó, Don Mario, COODETEC, EMBRAPA, Monsanto) (interview with SENAVE, Asunción, March 2011). In 2010, the most cultivated variety of soybeans was from

the Argentine company Relmó (interview with SENAVE, Asunción, March 2011). Igra Semillas is one of the few Paraguayan companies doing plant breeding in soybeans (interview with APROSEMP and PARPOV, Asunción, March 2011). The Paraguayan Chamber of Exporters and Traders of Grains and Oilseeds (*Cámara Paraguaya de Exportadores de Cereales y Oleaginosas* – CAPECO) also participates in the seed industry but only indirectly by sponsoring research projects. It has a joint project funded by the US Department of Agriculture to develop soybeans resistant to the ‘Asian rust’ disease (interview with CAPECO, Asunción, March 2011).

The participation of public R&D agencies in the soybean seed market is also weak. Suffering from persistent small budgets (interview with IPTA, Asunción, March 2011), Paraguayan public agricultural R&D programs have relied substantially on foreign donors and international credit institutions (Bisang et al. 2000: 15). These programs were among the smallest in the Southern Cone (Bisang et al. 2000: 15). The main organizations of public agricultural R&D were divisions of the Ministry of Agriculture and Livestock (especially the *División de Investigación Agrícola*) (Bisang et al. 2000: 10). The country had no independent public agency of agricultural R&D until IPTA was created in 2010. Currently, IPTA has 12 experimental stations located in half of the country’s provinces. Its staff consists of 78 people, the majority of whom work in R&D. The head of the institute acknowledged that the organization is understaffed (‘IPTA would need 300 hundred people to work properly’) (interview with IPTA, Asunción, March 2011). In 2011, the government assigned the agency a budget of 26,071,565,687 *guaranis* (circa US\$6 million), a small figure by regional standards (Ministerio de Hacienda, 30 August 2010). The agency’s headquarters in Asunción are small and have very modest facilities (personal observation by the author, Asunción, March 2011).

Underlying the weakness of the state in the provision of seed technology is the incapacity of the state to obtain tax revenues. The Paraguayan tax system is one of the main instruments for the reproduction of the power of agrarian elites, who basically control the country’s economy. By the end of the 2000s, the agrarian sector was responsible for around 25 per cent of gross domestic product (GDP), 26 per cent of employment and 90 per cent

of national exports (Molinas 2010: 9). Over the same decade, the soybean agro-industrial complex became the most important sector of the economy, responsible for an average of 50 per cent of exports from 2000 to 2008 according to data from ECLAC. In 2007, the top exporting company operating in Paraguay – transnational corporation Cargill – accounted alone for 18 per cent of the country's exports (Villagra 2009: 39). However, taxes on land are minimal and export taxes do not exist. In 2004, a new tax law was approved (*Ley de Adecuación Fiscal*), introducing a progressive tax on personal income and a tax on agricultural incomes for those who own over 300 hectares of land. The application of the law was delayed and only in 2012 did a tax on personal income become effective. Attempts to create taxes on agricultural exports have been strongly opposed by agrarian elites (interviews with CAPECO and *Centro de Estudios Rurales Interdisciplinarios*, Asunción, March 2011). As a consequence, the tax burden has remained low by regional standards, an average of 10.9 per cent of the GDP in 2000–05 (Brun 2010: 72).

According to sources from CAPECO, soy growers initially refused to pay royalties to Monsanto and negotiations lasted for around one and a half years (interview, Asunción, March 2011). According to sources from SENAVE, representatives for the soy growers defended the payment of royalties only at the purchase of seeds but the company argued this would be acceptable only if at least 70 per cent of cultivated seeds were certified (interview, Asunción, March 2011). As the estimates from APROSEMP quoted before suggest, this was far from the reality in Paraguay. Given the reluctance of rural producers, Monsanto told them that it could charge royalties at the ports of destination of Paraguayan soybean products (La Nación (Py), 04 February 2005), the same kind of threat it had been making to Argentine rural producers. As in Argentina, the RR gene had never been patented in Paraguay, so the corporation based its claims on patents held in Europe. According to sources from the Association of Soy Growers of Paraguay (*Asociación de Productores de Soja* – APS), SENAVE and APROSEMP, these pressures motivated the main organizations of Paraguayan agribusiness (APROSEMP, APS, CAP, CAPECO and FECOPROD) to present a proposal for Monsanto in September 2004 (interviews, Asunción, March 2011).³ The proposed mechanism was basically the same that had been demanded

by Monsanto: the charge of royalties on harvests at the moment of their sale by rural producers to crushing industries and trading houses.

The submission of soy growers, however, came with conditions. In the proposal, the Paraguayan organizations demanded that 10 per cent of the total amount of royalties should constitute a fund to finance R&D in agricultural biotechnology in Paraguay. The remaining resources would be shared between Monsanto (which would appropriate over 60 per cent) and the local seed companies that developed the locally adapted cultivars in which the RR gene had been inserted. In the letter sent along with the proposal, they stated that biotechnology is a 'critical and essential factor' for the development of Paraguayan agriculture (p. 1) and that 'a loss in the quality of our products as a result of technological advances that become available in other countries will severely affect our economy by deteriorating our competitiveness in the international market' (p. 2) (author's translation). Such assertions indicate that transnational competition between soy growers and the fear of exclusion from access to new technology were conditioning the decisions of the leaders of the Paraguayan soybean industry. The organizations also stated that among their motivations for the proposal were the legal implications of the Law of Seeds and Protection of Cultivars and of related international treaties signed by Paraguay (the Cartagena Protocol on Biosafety, the Convention on Biodiversity and the 1978 UPOV convention). Nevertheless, given that the RR gene was never patented in Paraguay (and as legal disputes in Argentina and Brazil suggest), the alleged legal implications were not really meaningful. In Argentina and Brazil, the 1978 UPOV convention and similar aspects of their laws of seeds have been used by rural producers to justify legal actions *against* Monsanto's system of royalty collection. The fact that Paraguayan organizations used that legislation to *justify* the system reveals their lack of capacity in IP and/or vulnerability to persuasion by the corporation.

On 14 September 2004, Monsanto formally replied with a counter offer detailing the implementation of the system. The proximity of dates suggests a very concerted interaction between the company and those organizations. In the document, Enrique Grazzini (Monsanto's manager for technological licensing) stated the advantages offered by RR soybeans as well as a list of countries where Monsanto held

a patent on the correspondent technology.⁴ The main points of the offer were:

- Starting with the harvest of 2004–2005, Monsanto would receive financial compensation in the form of royalties charged to rural producers by silos managed by trading companies and crushing industries. Soy growers would have the option of voluntarily declaring the use of RR soybeans and having royalties automatically charged. If the use of the technology was not declared, silos would be able to apply a test to detect the presence of RR soybeans. If undeclared RR soybeans were found, the soy grower would not only have to pay the correspondent royalties but also the costs of the test and a fine. Monsanto would be authorized to inspect silos.
- The amount charged to rural producers would be calculated according to the following formula: (exported volume, in ton) \times (percentage of RR soybeans in the volume) \times (royalty price, in US\$/ton).
- Royalties would be charged not only on soybeans but also on its processed products, such as soybean crush.
- The price of royalties would be US\$6 per ton of soybeans and US\$7.5 per ton of soybean crush. In 2005, a discount of 50 per cent would be given. The discount would decrease annually until 2008, when the full amount would be charged.
- The total amount collected would be shared between Monsanto and local seed companies that provide locally adapted cultivars where the RR gene is inserted. Monsanto would keep 65 per cent of the amount (which would decline annually reaching 53 per cent in 2008) and local seed companies would get 4 per cent (which would increase annually reaching 17 per cent in 2008). These proportions assume that 100 per cent of the cultivated seeds are legally purchased by rural producers. If not, the share of local plant breeders would be adjusted annually to the proportion of cultivated seeds that is certified and the remaining would constitute a fund for technological development. Considering that, according to APROSEMP and PARPOV, the use of certified seeds was around 30 per cent, that rule implied that around 10 per cent of royalties would go to the R&D fund.
- Monsanto would license its gene to local seed companies for insertion in locally adapted varieties and promises to promote the development of new technologies for Paraguay.

On the eve of a final agreement, CAP decided not to accept Monsanto's proposal. Among other things, the organization argued that:

- payments for seeds should continue to be made only at their purchase;
- Monsanto's desire to charge royalties at the moment of sale of grains came only after Argentine rural producers were not paying anything for the RR technology;
- in Brazil, a legislative proposal determining that royalties be paid only at the purchase of seeds was under consideration. (*La Nación* (Py), 05 February 2005)

The statements by CAP suggest that Paraguayan rural producers were aware of and constrained by decisions made in Argentina and Brazil. The resistance of Argentine rural producers and expectations about an arrangement more favorable to soy growers in Brazil encouraged them to contest Monsanto's offer. Since a large proportion of soy growers in Paraguay are of Brazilian origin, rumors spread quickly between the countries.

After further negotiations, on 8 March 2005, the Paraguayan organizations presented another offer.⁵ They stated upfront that the proposal would be valid only as long as its rules did not generate competitive disadvantages for Paraguayan rural producers. Specific reference was made to obligations that could be accorded in other countries in MERCOSUR, Chile and Bolivia.⁶ Again, transnational competition was shaping their behavior, since their concern was probably with not paying royalties higher than those expected to be eventually paid in Argentina and Brazil. In addition, the organizations agreed to the payment of royalties at the moment of sale of grains. This acceptance seems to be partly explained by rumors that Brazilian rural producers were at that point about to sign an agreement with Monsanto accepting the same rules (interview with SENAVE, Asunción, March 2011).

The organizations also demanded that the percentage to be charged on the value of the harvest would increase according to the international price of soybeans (starting at 1 per cent with the price at US\$140 per ton, up to 3.25 per cent if the price is equal to or higher than US\$201 per ton). This would not only protect rural producers against changes in prices but also allow Monsanto to appropriate

part of the extraordinary profits that could result from a boom in commodity prices (as turned out to be the case in the following years). According to this formula, in 2005, rural producers would pay US\$1.30 per ton of soybeans (a value much lower than the US\$3 originally proposed by the company).

In addition, they restated that 10 per cent of royalties should be used to fund local research and proposed the creation of the Institute for Research and Development of Agricultural Biotechnology, later renamed Institute of Agricultural Biotechnology (*Instituto de Biotecnología Agrícola* – INBIO). The proposed institute would be managed by those same organizations. Behind the demand for its creation was the weakness of local agricultural R&D capacity (interview with CAPECO, Asunción, March 2011). Claudia Russer, former president of APS, later pointed out that agricultural research had been abandoned by the Paraguayan state, with public research centers being shut down and state scientists being lost to private companies (interview of Claudia Russer for radio station Primero de Marzo, 2010, recording collected during fieldwork in Asunción, March 2011). According to sources from CAPECO, given the weak national R&D capacity, transfer of foreign technology and of financial resources to fund local research was the only way for rural producers to have access to biotechnological innovations (interview, Asunción, March 2011). As stated by sources from INBIO, the institute was created to compensate Paraguayan soy growers for the loss of competitiveness in the short term due to royalty payments and for the particularly bad geographical conditions of the country (no access to the sea) (interview, Asunción, March 2011). The new proposal also stated that local seed companies that developed cultivars containing the RR gene would receive part of the royalties. The proposed system of royalty collection would be in place only until 70 per cent of cultivated seeds were certified. After that, rural producers would start paying royalties at the purchase of seeds.

The proposal was soon accepted by Monsanto and royalties were already being charged by the harvest of 2004/5. When the Argentine Secretary of Agriculture called a meeting of MERCOSUR to form a South American coalition against Monsanto it was already too late. The meeting had no impact on the private contract that had just been reached between the corporation and Paraguayan soy growers. As expected, the agreement satisfied US authorities. A report from

the US Department of Agriculture referred to Paraguay's royalty collection system as 'a well documented success story in the region' and 'a positive step in closing Latin America's biotech black market' (Yakelevich 2010: 1, 4).

Interestingly, the accorded method of calculation and charge of royalties is very similar to that of export taxes implemented in Argentina during the Kirchner administration (*retenciones móviles*). With the mechanism of *retenciones móviles*, as international prices for soybeans go up, so do taxes paid by rural producers. This brings forward the role of export taxes in conflicts over IP on seeds. In Paraguay, as in Argentina, soy growers see royalty payments as analogous to export taxes but precisely because export taxes are virtually zero in Paraguay, Paraguayan soy growers are less discontent than their Argentine counterparts in relation to royalty payments. However, since they accepted paying royalties to Monsanto, they have become even more opposed to attempts by the state to charge export taxes.

When talking about the agreement with Monsanto, Claudia Russer (APS) mentioned that negotiations for the agreement took place during the administration of President Nicanor Duarte, who had been trying to extract more taxes from agribusiness. Allegedly, Duarte had told soy growers that his government could not fight land invasions promoted by rural social movements because it had no resources to fight poverty and to support peasant settlements resulting from agrarian reform. According to Russer, for one year the agribusiness sector agreed to pay higher taxes hoping that resources would be used to support peasants. Apparently this did not happen, which is why later Russer argued that proposals to tax soybean production are unwarranted given that rural producers already pay royalties to Monsanto. The royalties, according to her, at least are partly used to fund local agricultural R&D, an activity that has not been supported by the state (interview of Claudia Russer for radio station Primero de Marzo, 2010, recording collected during fieldwork in Asunción, March 2011).

As pointed out by Ramón Fogel, a local professor who runs the *Centro Interdisciplinario de Estudios Rurales*, big rural producers accept paying royalties to Monsanto more easily than they accept paying taxes (interview, Asunción, March 2011). Given the oligarchic nature of the Paraguayan state, this is so because soy growers have more power vis-à-vis the state than vis-à-vis a transnational corporation.

With scarce financial resources due to the reluctance of the elites to pay more taxes, the state remained incapable of providing technology for rural producers and of protecting them from coercion by a transnational corporation. The weakness of the state was clearly shown in the fact that it simply endorsed the proposal made by Paraguayan organizations to Monsanto without having taken part in the negotiations (interviews with APROSEMP, CAPECO, INBIO, IPTA, PARPOV and SENAVE, Asunción, March 2011).

Lastly, another condition that weakened Paraguayan rural producers in relation to Monsanto was their pattern of mobilization. Although soy growers were mostly represented by APS in IP negotiations, their political representation has been very much intertwined with that of actors of other segments of the soy commodity chain, which, in some respects, have divergent interests. APS is a member of the Union of Production Guilds (*Unión de Grémios de la Producción* – UGP), one of the most important business associations of Paraguay (González 2010: 93) which also includes APROSEMP (seed companies) and CAPECO (exporters). Looking at the boards of directors of the main organizations participating in IP negotiations with Monsanto during and after the agreement was signed (APROSEMP, APS, CAPECO, FECOPROD, INBIO, UGP), it is clear that there is substantial overlapping among them. Leaders of one organization commonly hold positions on the boards of one or more of those organizations (author's review of institutional websites retrieved on 18 March 2011). In visits to these organizations, it is easy to realize that 'everyone knows everyone' (personal observation, Asunción, March 2011).

This knitted organization of political representation was actually mentioned by members of the board of directors of those organizations as a condition facilitating the settlement with Monsanto (interviews with CAPECO and APS, Asunción, March 2011). Sources from SENAVE share this understanding (interview with SENAVE, Asunción, March 2011). In such a framework, it becomes difficult for rural producers, especially the small ones, to articulate their specific demands in the face of the more powerful actors from other segments of the commodity chain. Furthermore, Paraguayan soy growers were not assisted by IP experts that could help them in the formulation of a compelling discourse. As pointed out by sources from SENAVE, local institutional and human resources capabilities in IP on plant

varieties are very weak. All local human resources knowledgeable in the matter were officials trained by UPOV (interview with SENAVE, Asunción, March 2011). Finally, APS was then only a few years old and did not have extensive organizational and political experience. Its headquarters in Asunción were modest facilities in comparison to those of equivalent associations in Argentina and Brazil (personal observation, Asunción, March 2011).

The disagreement with Monsanto

In March 2006, because of losses caused by a long drought, soy growers asked Monsanto for a discount in the value of royalties to be charged on the harvest of 2005–2006. The answer was positive and, in that year, a charge of only US\$2.64 per ton was applied instead of the US\$3.22 that had been determined by both parties in July 2005 (ABC Digital, 21 March 2006). In October 2007, representatives of rural producers, local seed companies, exporters and Monsanto agreed on a value of US\$4.4 per ton for the 2007–2008 harvest (Ultima Hora, 03 October 2007). In the two years that followed, the value of royalties was left unchanged because of demands from APS (Ultima Hora, 27 September 2009; La Nación (Py), 23 January 2011). Monsanto also announced projects for local R&D investment and ‘corporate social responsibility’ in the country. In August 2008, the company announced it would take the first steps to conduct experiments with RRBt soybeans in Paraguay. In 2009, it made public the project for a school of sustainable agriculture to serve peasant and indigenous youngsters and also said it would support non-profit organizations dedicated to small rural enterprises (Ultima Hora, 22 September 2009). In February 2011, Monsanto opened an experimental station in the locality of Santa Rita to conduct research on varieties of maize adapted to Paraguay. The station involved an investment of US\$500,000 and would intensify the research activities that the company had been performing for four years in different regions of the country (ABC Digital, 02 February 2011).

Notwithstanding these concessions, Paraguayan soy growers still see their relationship with Monsanto as one of unequal exchange. Having been the first in the region to reach an IP agreement with Monsanto, they expected the company to contribute more to the country in terms of local investment than it actually has (interview with CAPECO, Asunción, March 2011). According to APS, rural

producers feel that, despite royalty payments, no benefit other than the use of the RR technology had been obtained (interview, Asunción, March 2011). In fact, despite the approval of RRBt soybeans by SENAVE, as of March 2011 no official tests had yet been made by Monsanto or IPTA with this variety (interview with SENAVE, Asunción, March 2011). It was only in February 2013 that the Ministry of Agriculture authorized the cultivation of RRBt varieties. Although the delay in the commercial release of this new variety might have technical reasons, it might also be partly intentional. The company might have slowed down the process of commercial release to have a bargaining chip to encourage soy growers and governments (especially in Argentina) to respect its IP rights in order to have access to the promised technology. It can do so as long as soy growers in South America are still paying for RR soybeans and no alternative technology has been provided by Monsanto's competitors. In the interview given to radio station Primero de Marzo in 2010, Claudia Russer (APS) emphasized that rural producers have not received any new generation of GM seeds after the agreement with Monsanto. Although the company did establish a local division, only 35 per cent of the US\$30 million in royalties paid by Paraguayan soy growers stay in the country (through INBIO and local breeding companies) (Claudia Russer, interview to radio station Primero de Marzo in 2010). As we will see, it was only after Paraguayan soy growers started to criticize Monsanto based on allegations that the company was charging royalties in Brazil based on expired patents that the government authorization for RRBt soybeans came out.

Early in 2011, complaints among rural producers about royalties increased. Many of them said they did not know the details of the agreement with Monsanto or the criteria used to determine royalty amounts, which were considered too high by many (La Nación (Py), 23 January 2011). Indeed, the royalties percentages charged to rural producers have not followed the formula established in the original agreement; they have been set yearly in ad hoc negotiations between Monsanto and the local agribusiness trade (interview with APROSEMP and PARPOV, Asunción, March 2011). In addition, most rural producers disagree with the obligation of having to pay royalties at silos instead of at the purchase of seeds and with the criteria for division of royalties between Monsanto, local plant breeders and INBIO (interview with APS, Asunción, March 2011). Many farmers

have royalties charged automatically at silos without consent, frequently without knowing what value was actually owed (interview with APS, Asunción, March 2011). Also, APS considers the rigid contract signed with Monsanto confiscatory and illegal given that the RR gene has not been patented in Paraguay (interview, Asunción, March 2011).

When asked about the situation for Argentine and Brazilian soy growers, APS sources stated that in Argentina rural producers do not pay royalties to Monsanto because the company has lost lawsuits and that in Brazil the Paraguayan model was adopted (interview with APS, Asunción, March 2011). The fact that Paraguayan soy growers were discontent with Monsanto but also knowledgeable of the legal fragilities of its mechanism of royalty collection and of the regional dimension of related conflicts demonstrates that their acquiescence to the agreement ultimately resulted from the weakness of the Paraguayan state, the foreign control of seed technology and the weak mobilization of Paraguayan rural producers around IP.

Soy growers are not the only ones to be discontent. Local seed companies and plant breeders have complained that Monsanto's system of royalty collection did not stimulate rural producers to purchase certified seeds from local seed companies. According to them, rural producers' major concern is with fulfilling the obligations to Monsanto at the moment of sale of grains to silos (interview with APROSEMP and PARPOV, Asunción, March 2011). This information is confirmed by sources from APS, who mention that Monsanto is not concerned with encouraging rural producers to use certified seeds (interview, Asunción, March 2011). In November 2010, amidst discontent of soy growers and local seed companies, the system of royalty collection was changed to give rural producers the option of paying for royalties at the moment of purchase of seeds (a transition that had been mentioned in the original agreement with Monsanto but that the system itself did not stimulate).

Under the new, mixed system, rural producers who opt for the payment of royalties at the moment of purchase of certified seeds will receive documents that exempt them from the payment of royalties on the sale of grains proportionally to the amount of certified seeds purchased (interviews with APROSEMP and INBIO, Asunción, March 2011). According to APS and INBIO, this option will imply lower payments by soy growers (ABC Digital, 04 November 2010). In

addition, it will encourage the use of certified seeds, satisfying local seed companies.

More recently, a number of soy growers have tried a rotation of RR and conventional soybeans as a way to reduce dependency on Monsanto and to prevent the appearance of parasite herbs resistant to glyphosate, obtaining good results (interview with SENAVE, Asunción, March 2011). However, conventional varieties with good performance in Paraguay are scarce, since almost everything cultivated is GM. New conventional varieties are being imported from Brazil (developed by the state-owned corporation EMBRAPA and by the cooperative of rural producers COODETEC) (interview with SENAVE, Asunción, March 2011). Again, the strategy of soy growers in Paraguay was dependent on that of Brazilians, given their weak local R&D capacity.

According to sources from CAPECO, one of the reasons why these conflicts over IP were not more intense was the boom in international prices for soybeans that prevailed in the late 2000s (interview, Asunción, March 2011). If in early 2005 low prices were used by Paraguayan rural producers represented by CAP as a reason to oppose royalty payments, later high prices became a palliative to their discontent over royalties. A requisite for this has been the absence of taxes on agricultural exports, an aspect of the relationship between the state and soy growers that has been emphasized in this book as an explanation for IP regimes. The absence of export taxes has allowed rural producers to appropriate a sizable share of extraordinary export revenues, making royalties more affordable.

In 2012, when the news of judicial victories by Brazilian soy growers against Monsanto arrived in Paraguay, the opposition to Monsanto escalated. With the assistance of Neri Perin, attorney for APROSOJA-RS – one of the main associations involved in disputes with Monsanto in Brazil – APS demanded from Monsanto the suspension of royalty charges arguing that patents on RR soybeans had expired in 2010 and that the technology was in the public domain (ABC Color, 26 November 2012). FECOPROD, the National Central of Cooperatives (*Central Nacional de Cooperativas* – UNICOOOP), APROSEMP, CAPECO and CAP, however, issued a joint statement saying that ‘Monsanto holds intellectual property rights related to Roundup Ready soybeans and products from RR soybeans in countries that constitute the destination markets for Paraguayan

production. For this reason, in 2004 there was an agreement on a mechanism for royalty payments... so that RR soybean products can be exported to countries where [Monsanto's] intellectual property rights are in effect' (ABC Color, 26 November 2012, author's translation). This claim is not valid considering the defeat of Monsanto in the judicial dispute with Argentina in European courts. The fact that the statement came from a group of organizations that includes rural producers and years after Monsanto's defeat had been widely publicized by the regional media is quite shocking and suggestive of how Paraguayan organizations have been hegemonized by the corporation. Once more, organizations of rural producers (CAP, FECOPROD, UNICOOP) were unable to mobilize independently from organizations of seed companies and exporters (APROSEMP, CAPECO), with whom they have strong connections.

For APS, the acquiescence of those organizations to Monsanto was either a product of the pressures exerted by the corporation or of the fear on the part of officials of those associations of losing privileges related to contracts with INBIO, the local research institute funded by Monsanto (La Nación (Py), 02 November 2012). The latter claim suggests the co-optation of local groups by the corporation. In the absence of an understanding with Monsanto and the other local organizations, APS took the issue to court but in April 2013 a judge decided in favor of Monsanto (Reuters, 27 March 2013) (in spite of the similarities between Paraguayan and Brazilian law and of the absence of a patent on RR soybeans in the country). APS also tried to mobilize ISGA, which held a meeting in Asunción in November 2012, but no effective mobilization against Monsanto came out of the meeting.

Still, APS stated that soy growers are not against IP but defend that it should be compensated with fair and legal payments (La Nación (Py), 10 November 2012). The organization also declared that the contestation of royalties on RR soybeans does not harm negotiations related to new technologies, such as RRBt soybeans (Reuters, 05 February 2013), demonstrating once more the concern of Paraguayan soy growers with losing access to foreign technology. Their mobilization, however, yielded some partial benefits. Around a week after soy growers led by APS filed the lawsuit against Monsanto, the Ministry of Agriculture finally issued the authorization for commercial cultivation of RRBt soybeans. In addition, Monsanto offered

Paraguayan soy growers a 'waiver' on royalties on RR soybeans starting in 2014 as a way to encourage an 'orderly transition' to RRBt varieties (Reuters, 27 March 2013), the same measure it took in Brazil to co-opt rural associations after a transient judicial ruling strengthened the mobilization of soy growers against the company.

Meanwhile, Monsanto keeps publicizing in Paraguay a discourse that mobilizes the competition between South American soy growers in its favor. In February 2010, during an event sponsored by the Paraguay-US Chamber of Commerce, a representative of the company gave a talk in which he argued that Paraguay should be faster in the adoption of biotechnology, one main reason for that being the fact that Brazil was taking the lead in this process, increasing the competition in global markets (Ultima Hora, 12 February 2010). In March 2013, Monsanto's Latin America manager for regulatory affairs, Hugo Campos, stated during an event in Asunción that 'the company's goal is that the Paraguayan producer is able to compete in equal conditions with his competitors from MERCOSUR and that with this purpose it is fundamental that they [Paraguayan soy growers] use biotechnologies of the latest generation [such as RRBt soybeans]' (Monsanto, 16 June 2013).

Conclusion

The Paraguayan IP regime on seeds has reproduced the global trend toward stronger IP at a faster pace than the Brazilian and, more obviously, than the Argentine IP regime. In 1994, the Law of Seeds and Protection of Cultivars established protection for private IP rights on seeds in the country based on the principles of UPOV 1978. In 2000, a new law of patents was created adapting the country's legislation to TRIPS. Since then, a government agency has been created to enforce IP rights on plant varieties (SENAVE) and a definitive regulation restricting the right to save seeds was issued in 2012. Bypassing public IP policy-making, Monsanto coerced organizations of local agribusiness to accept a private system of royalty collection for RR soybeans that came into force in 2005. The system was soon extended to Brazil but Paraguay remained the South American country where Monsanto had the strongest grip. This combined trajectory of international, transnational and national IP regimes in Paraguayan soybean agriculture corresponds to a dependent model

of IP regulation in which foreign IP-holders are able to obtain strong protection for private IP rights because of the weak technological capacity of local actors and the presence of a weak state. As argued in this chapter, this was a result of the following factors.

Relations between the state and knowledge-users

Soy growers have become the most important segment of the agrarian oligarchy that has ruled Paraguay. In spite of the centrality of soybean agriculture to the economy, this landed elite has been able to protect its wealth from taxation. This had three important implications for the Paraguayan IP regime on seeds:

- it limited the capacity of the state in IP (and thus its capacity to formulate and implement an IP regime consistent with national interests and to defend local knowledge-users from foreign pressures);
- it undermined the capacity of the state to promote competition in the seed industry through agricultural R&D (see below);
- it allowed soy growers to appropriate export incomes almost entirely and, thus, diminished their discontent (and mobilization) around IP issues (see below).

Regarding the institutional links between the state and soy growers, the making of IP rules for agriculture has happened in the absence of a formal site for discussions between the state and private actors, which have happened informally or through ad hoc channels that favor the capture of the rule-making process by private interests. Moreover, the state abstained from interfering in the negotiation and implementation of Monsanto's system of royalty collection, which eliminated the right to save RR seeds at no cost despite the absence of a patent on the RR technology in the country.

Competition in the provision of technology

Regarding agricultural R&D, the incumbent divisions under the Ministry of Agriculture and Livestock have historically suffered from small budgets and dependence on foreign funds. This situation did not change after the creation of IPTA in 2010. Even INBIO, which is managed by private organizations, is highly dependent on foreign sources of funds (Monsanto, most importantly). The pattern of

competition in the provision of seed technology in Paraguay has been characterized by foreign control, which leaves local knowledge-users vulnerable to the demands of foreign IP-holders.

Mobilization of knowledge-users

Paraguayan soy growers have shown weak mobilization around IP issues. They were represented by a young organization (APS) that operated under and alongside interest groups that represented segments of the agrarian sector with opposing interests in relation to IP (seed companies and transnational corporations). Soy growers have also not been able to articulate a public discourse that goes beyond short-term distributional complaints about royalty values.

Finally, Paraguayan rural producers have been vulnerable to transnational competitive pressures that motivated some of their organizations to make concessions to foreign seed companies in the form of stronger protection for IP. This was clearly manifest during the establishment of Monsanto's system of royalty collection and also in the negotiations with the corporation about the commercial release of RRBt soybeans.

The recent collaboration between Paraguayan and Brazilian soy growers involved in disputes with Monsanto has so far not produced effective changes in Paraguay but reveals a potential for stronger cooperation in the future. If Brazilian soy growers eventually obtain a final favorable ruling against Monsanto, this might motivate Paraguayan soy growers to fight the corporation again, seeking assistance from their neighbors. As new non-GM varieties of soybeans developed by EMBRAPA are exported from Brazil to Paraguay, the dependence of local soy growers on Monsanto might also diminish, increasing their bargaining power in relation to the US corporation. It is unlikely, however, that Paraguayan soy growers would be able to hold back Monsanto's efforts by relying solely on their own resources.

5

Conclusion: Seeds of the Future

Theory

In the previous chapters, I developed a theory of institutional change in IP based on the case of South American soybean agriculture. I explained why the global trend toward stronger private IP launched by the US around 1980 has been reproduced in different forms and degrees across Argentina, Brazil and Paraguay. At the center of my narrative was transnational corporation Monsanto, which has employed different strategies vis-à-vis national governments and rural producers to increase protection for private IP rights on the seed and herbicide technologies it provides to rural producers.

My first finding is that the global trend toward stronger IP is escapable, uneven and does not fit neatly into national spaces over which states exert sovereignty. It is escapable because its reproduction is contingent upon conflicts between IP-holders, users of IP goods and the state. As the case of Argentina shows, users of IP goods can win such conflicts and partially contain the trend. Thus, the narrative presented in this book ‘disables’ the view of globalization as ‘an active, inexorable set of technological and market forces restlessly roving the globe, while “the local” appears as the passive feminine recipient of these forces’ (Hart 2002: 293). Because of those conflicts, the global trend toward stronger IP is uneven across space (developing in certain countries more than in others) and time (experiencing big pushes when certain treaties or legislative reforms are approved or being momentarily halted by local judicial disputes). The global strengthening of IP cannot be fully captured under

the national–international dichotomy because transnational private IP regimes like Monsanto’s can embody the trend while bypassing and contradicting but also being based upon national and international IP regimes. Transnational IP regimes can be seen as ‘partial and autonomous systems of rule for governing specialized sectors’, which – as stated by Sassen (2008: 222–4) – are associated with the denationalization of state agendas and with the emergence of privatized forms of authority under globalization. This is an important blind-spot of the literature on the political economy of IP, which has largely focused on international treaties and their ‘internalization’ by national states.

Previous studies have shown how the negotiation of TRIPS and its ratification by governments of developing countries involved coercion and non-democratic bargaining by governments of core countries and international financial institutions. My analysis of Monsanto’s system of royalty collection adds to this picture the democratic deficit of transnational authority in IP. The design and implementation of Monsanto’s transnational IP regime was not inclusive of all relevant stakeholders and relied on coercion and co-optation. However, the fact that EMBRAPA – the Brazilian state-owned agricultural R&D corporation – became a direct beneficiary of this system shows that the state does not necessarily retract as transnational authority expands. They can partially penetrate each other.

To account for this complexity, I proposed a theory of formation and change of IP regimes combining four interconnected processes:

- transnational competition;
- relations between the state and knowledge-users;
- competition in the provision of technology;
- mobilization of knowledge-users.

While the first process operates across national boundaries, the latter three are country-specific variables that mediate the reproduction of the global trend toward stronger IP on the national level.

How transnational competition has shaped IP regimes

My analysis showed that competition between actors from developing countries for foreign markets and technology has facilitated the

reproduction of the global trend toward stronger IP regimes. Competition drove them to make concessions to IP-holders from core countries in the form of stronger protection for IP. In South American soybean agriculture, the effects of competition on IP regimes were first felt as a consequence of TRIPS, which has rules applicable to agricultural biotechnology. Afraid of being excluded from access to the US market and from investments by US corporations, Argentina, Brazil and Paraguay signed the treaty in spite of internal opposition. Later, Monsanto took advantage of competition among soy growers from the three countries to obtain stronger protection for IP on seeds.

This first became clear when Monsanto sought to obtain protection for RR soybeans in the three countries. Brazilian and Paraguayan soy growers reasoned that Monsanto's promises of first-hand access to new technology and support to local research in exchange for stronger IP protection would give them a competitive advantage in the world soybean industry. In this instance, the time sequence was crucial. When the Argentine government contacted its partners in MERCOSUR to arrange a common stance against Monsanto, the company had already been discussing IP issues with Brazilian and Paraguayan rural producers. At the time Monsanto was negotiating with Brazilian and Paraguayan soy growers, it had already excluded Argentina from its research and sales operations with soybeans and was threatening to exclude the country from the international soybean trade via judicial action in the European courts. In the face of these threats, Brazilian and Paraguayan soy growers opted for being exploited by Monsanto through royalty charges to avoid being excluded by the company from markets and technology. Afterward, the commercial release of RRBt soybeans was another card played by Monsanto to tame the resistance of soy growers against stronger protection for IP rights. In one of the most symbolic examples of this strategy, Monsanto offered Brazilian soy growers discounts on royalties over RRBt soybeans only if they dropped the lawsuit that claimed that the corporation had been charging royalties on RR soybeans based on expired patents. Soy growers that insisted on the judicial claim would have their competitive position harmed by the higher prices they would have to pay for RRBt seeds. In sum, Monsanto was able to do on a regional and industry level what the US government performed on an international scale with TRIPS: to obtain concessions from developing countries competing for market access

by threatening them with exclusion from the world economy and by preferring bilateral over multilateral negotiations.

How relations between the state and knowledge-users have shaped IP regimes

I argued that economic and institutional links between the state and knowledge-users are an important condition affecting IP regimes.

Economic links between the state and knowledge-users

Soybean agriculture has expanded substantially in Argentina, Brazil and Paraguay since the 1990s but acquired different roles in the national political economy of each country. In Argentina, it became a very important part of the economy and a significant source of export earnings and tax revenues. Soybean agriculture also became a key industry in Paraguay but with no major contribution to tax revenues. In Brazil, it became neither a crucial source of foreign currency nor a relevant source of taxes. Export taxes are an aspect of the relationship between the state and soy growers with an important effect on national IP regimes. In the global soy commodity chain, export taxes have been inversely related to royalties on seeds (and, thus, to the strength of IP regimes). In the US, where taxes are sometimes negative because of subsidies, the IP regime is strong and royalties are high. In Argentina, where taxes are high, the IP regime is weak and royalties are low. In Brazil and Paraguay, where export taxes are virtually zero, IP regimes are stronger (and royalties higher) than in Argentina but weaker (and royalties lower) than in the US. As shown in previous chapters, this is because, on one hand, sizable export taxes make soy growers less willing to pay royalties and, on the other hand, significant tax revenues make the state more willing to protect incomes from the export sector from appropriation by foreign corporations in the form of royalties.

Institutional links between the state and knowledge-users

The Argentine case shows that a corporatist framework for IP rule-making is conducive to a permissive IP regime because direct and stable formal links to the state are more important for knowledge-users than for IP-holders. In agricultural biotechnology, IP-holders are powerful large corporations that are likely to have direct access to state officials even in the absence of corporatist links to the state.

By contrast, rural producers are much more numerous and are territorially scattered in the countryside. Even the organizations that represent them are more numerous than those that represent the seed industry. Corporatist links are thus particularly important for rural producers in shaping IP rules. A relevant characteristic of the corporatist making of the Argentine IP regime has been the relatively small role played by the Parliament. Argentine congressmen were not key players in the controversies over IP in agriculture. Proposals for a new law of seeds were discussed almost exclusively at CONASE or directly between rural producers' organizations, the Ministry of Agriculture and the seed industry.

The institutional relationship between soy growers and the state in Brazil resembled a pluralist model with fragmented and unstable links that favored the strengthening of the IP regime. Between 1996 and 2002, when crucial legislation for the Brazilian IP regime was being enacted or formulated, committees of the corporatist type within the Ministry of Agriculture were being dismantled as part of neoliberal reforms. The 1997 Law of Protection of Cultivars determined the creation of a committee under the ministry to discuss IP on plant varieties but this never became a reality. Currently, proposals for a new law have been discussed by different committees within the ministry where issues completely unrelated to IP are also debated. In this context, the Parliament has played a more active role in IP rule-making. The Committee of Agriculture of the Brazilian Chamber of Deputies is an important site where bills concerning IP on plant varieties have been proposed and discussed with intermittent participation of representatives from rural producers, seed companies and NGOs.

In Paraguay, the making of IP rules applied to agriculture resembled a state capture and abstention model: powerful interest groups mobilized informal links to the state to obtain particularistic benefits (such as the overturning of regulations on the right to save seeds), rule-making within the state was ad hoc (the 1994 Law of Seeds and Protection of Cultivars called for the creation of a committee emulating the Argentine CONASE but this never came to fruition) and important rules were formulated by private actors bypassing the state but later obtaining its endorsement (especially the agreement with Monsanto). Because the state is weak and the country poor, local capacity in IP is weak and the state has been dependent on (and

vulnerable to) foreign actors in the formulation of IP rules. This situation has benefited powerful actors, like Monsanto, which have direct access to the state and coercive capacity to impose their terms in private contracts.

Therefore, in comparison to their Brazilian and Paraguayan counterparts, Argentine soy growers were in a unique structural position within the national political economy to influence their country's IP regime. As a consequence, the Argentine state was more sensitive to demands from soy growers than the Brazilian state. In the dispute with Monsanto, the Argentine state assumed a coordinating role in the negotiations with the corporation and in the resistance against Monsanto's court cases in Europe. Conversely, the Brazilian state abstained from direct intervention. The ease with which agricultural biotechnology was adopted in Argentina – with no major conflicts involving NGOs or social movements – also suggests that Argentine rural producers' organizations have more power within the national political economy than their Brazilian counterparts, which had to overcome strong resistance from NGOs and social movements to use transgenic technology legally.

How competition (or the lack thereof) in technology provision has shaped IP regimes

I have argued that patterns of competition in the provision of technology affect IP regimes by changing the interests of domestic actors (including the state and knowledge-users) in IP protection. Particularly important is the role of the state in the provision of technology. In Argentina, the capacity of the state to provide soybean seed technology has weakened from the 1970s to the 2000s. In Paraguay, it has always been weak. In Brazil, the state is an active player in the provision of soybean seed technology through a vibrant public agricultural R&D corporation (EMBRAPA) whose technological capacity has increased over time. These differences can be summarized by two indicators: the share held by state R&D agencies in the soybean seed markets and the annual budget of those agencies. The market shares of INTA (Argentina) and IPTA (Paraguay) have declined to the point of being insignificant around 2005. Meanwhile, EMBRAPA has sustained a share of around 30 per cent of the Brazilian market and has directly participated in the development of new GM varieties of soybeans. Their budgets are also widely disparate. In 2011,

IPTA had access to around US\$6 million, INTA to US\$310 million¹ and EMBRAPA to US\$1 billion.

In Argentina, the weakening capacity of the state in agricultural R&D has been coupled with the subordination of local private seed companies to foreign transnational corporations. Argentine seed companies were limited to the development of locally adapted varieties through conventional plant breeding as opposed to more complex operations with genetic engineering that are carried out further upstream in the commodity chain by transnational companies. INTA's participation in the design of IP legislation went from pro-knowledge-user activism in the 1970s to the passive role of following rules decided in negotiations between the Ministry of Agriculture, the private seed industry and rural producers' organizations. Given the weakening of the local seed industry, Argentine soy growers have become increasingly aware of their dependence on foreign companies to obtain crucial technology and, thus, more protective of the right to save seeds. However, unlike Paraguayan rural producers, they have benefited from the presence of a relatively strong state capable of sustaining weak protection for private IP rights in spite of coercion by foreign actors.

In Brazil, mergers and acquisitions of local private seed companies by foreign transnational corporations did not result in the denationalization of the seed industry. Cooperatives of rural producers (such as COODETEC and *Fundação MT*) and, more importantly, EMBRAPA have retained a strong position in local seed markets. For this reason, Brazilian soy growers have not depended solely on the protection of the right to save seeds as a way to resist the global trend toward stronger IP regimes and the transnationalization of the seed industry. They have allied with EMBRAPA to increase the supply of non-GM soybeans in Brazil, reducing their dependence on Monsanto. Moreover, as EMBRAPA's technological capacity and international presence increased, the agency abandoned its original stance against private IP rights on plant varieties and became an active proponent of legislative changes that would make the Brazilian IP regime more restrictive.

In Paraguay, the weak participation of the state in the provision of seed technology coupled with the weakness of the local private seed industry forced the government and soy growers to offer stronger protection for IP in exchange of seed technology provided by foreign

companies. IPTA has not participated in the formulation of IP rules applicable to agriculture, which is not surprising considering that the Paraguayan state has recurrently relied on foreign assistance to create IP legislation. Thus, while the Brazilian state supported soy growers with technology and the Argentine state supported them with rights, the Paraguayan state could do neither.

How mobilization of knowledge-users has shaped IP regimes

My analysis stressed that state elites and transnational corporations were not the only actors shaping IP regimes in South American soy-bean agriculture. Rural producers have influenced IP rule-making but their capacity to do so has been proportional to the strength of their mobilization. I focused on four aspects of their mobilization around IP:

- the organizational stability of their political representation;
- the degree of coordination between their associations;
- the existence of independent channels for the expression of the interests of knowledge-users most sensitive to IP issues;
- the articulation of a public discourse capable of drawing support from a broad coalition.

In all aspects, Argentine soy growers had more effective mobilization in IP conflicts than their Brazilian and Paraguayan counterparts in the 1990s and 2000s.

Argentine rural producers have been favored by the stability and national scope of the organizations representing them in IP politics (CRA, CONINAGRO, FAA and SRA). These organizations have national scope and a long history of participation in politics, including formal participation in committees within the state. Although sectorial organizations have emerged more recently – such as the Association of the Argentine Soybean Chain (*Asociación de la Cadena da la Soja Argentina*) – these four organizations have remained as the main interlocutors between rural producers, state officials and seed companies in IP policy-making. Although large landowners linked to SRA have connections to finance and industry and some members of CONINAGRO also operate in the seed industry, those four organizations are essentially associations of rural producers. In particular, FAA has remained as an independent channel for the articulation

of demands from small holders, who are the most sensitive to seed costs.

The mobilization of Brazilian soy growers around IP issues has been much less stable and coordinated. Their structure of representation has been unsteady since the end of the 20th century. While the capacity of traditional organizations like CNA to represent the agrarian sector was unraveling, organizations led by big corporate agribusiness (OCB and ABAG) as well as sectorial organizations (APROSOJA) emerged as new vehicles for the representation of rural producers in IP politics. Within CNA and OCB, members linked to the seed industry had a stronger voice than rural producers in the formulation of these organizations' positions on IP on seeds. None of the national organizations that have soy growers as an important segment of their membership has consistently opposed Monsanto in IP disputes. Even the state-level associations directly involved in conflicts with the corporation have acted independently from each other on the matter or have been co-opted by Monsanto.

In Paraguay, negotiations for the design, implementation and operation of Monsanto's system of royalty collection have been carried out by a small group of organizations with a high level of cross-membership (mainly APROSEMP, APS, CAPECO and UGP). These organizations include seed companies and transnational corporations, which makes it difficult for APS – a recently created organization – to mobilize rural producers independently or to pursue a more radical course of action.

These patterns of mobilization reflect class divisions and alliances. As the cases of Brazil and Argentina show, small rural producers have been more sensitive to IP issues than large rural producers and, thus, have adopted a more radical stance in IP politics. However, in the disputes with Monsanto, while small soy growers in Argentina were represented by a century-old organization of national scope (FAA), in Brazil they were represented by a state-level organization founded only in 2006 (APROSOJA-RS).

Argentine rural producers have also been more effective than Brazilian and Paraguayan soy growers in their capacity to produce a compelling public discourse. Paraguayan soy growers have not produced a coherent public discourse about IP on seeds. Their public statements have been limited to intermittent complaints about royalty prices and alleged abuses by Monsanto. Brazilian soy growers

have developed a more comprehensive discourse, justifying their claims in terms of Brazilian legislation, but remain very focused on the distributive implications of IP rights on seeds. By contrast, Argentine rural producers have framed their claims in terms of the public interest and national sovereignty. This has been favored by their structural position within the national political economy of Argentina but has also been a result of a deliberate effort involving collaboration with IP experts and the promotion of public conferences on the theme. In 2005, FAA had already published an entire 287-page book narrating the conflicts over IP on seeds in the country – a clear demonstration of how articulate it is in IP matters.

Another difference between the mobilization of rural producers in Argentina, Brazil and Paraguay has been the role played by seed multipliers. Because of their intermediary position in the commodity chain, they have an ambiguous stance in IP disputes: they want to fight seed piracy but do not want seed companies to appropriate too much of the royalties paid by rural producers. For this reason, in all three countries seed multipliers have had differences with transnational seed companies. However, only in Argentina did a clear antagonism (and new interest groups) emerge such that seed multipliers – represented by CASEM (the Argentine Chamber of Seed Multipliers) – became an active ally of rural producers in the resistance against transnational seed companies.

To sum up these conclusions, in a context where transnational competition between actors from Argentina, Brazil and Paraguay prevailed, three distinct patterns of relations between the state, knowledge-users and IP-holders have produced three different modes of regulation of IP. In Argentina, an old developmental model characterized by a permissive national IP regime centered on the right to save seeds has remained in place since the 1970s. The early adoption of IP rules consistent with UPOV 1978 and the establishment of a corporatist framework for rule-making might have set in motion path dependency mechanisms that contributed to the persistence of Argentina's IP regime. Institutions can create powerful vested interests that tend to stabilize and perpetuate the social order prevailing at their origin. The political learning experienced by rural associations through participation at CONASE and the appropriation of most economic benefits from seed technology by rural producers have operated in this direction. Institutional persistence, however,

does not happen mechanically and this book revealed the social processes that explain the stability of the Argentine IP regime. In Brazil, a neodevelopmental model characterized by stronger protection to private IP rights and associated with increased indigenous technological capacity emerged during the 2000s. From a class perspective, the key characteristics of the Argentine IP regime on seeds can be traced back to an affinity of interests between rural producers and the state. In contrast, the Brazilian IP regime can be traced back to an affinity of interests between capital in the seed industry (including its national segment) and the state. In Paraguay, a dependent model characterized by strong protection to private IP rights has been reproduced ultimately because of the technological, political and economic fragilities of the country.

Last but not least, underlying the explanation presented above is the assertion that IP regimes are a result of conflicts and alliances between actors with different interests and resources. Therefore, the findings of this book challenge realist and functionalist theories of institutional change applicable to IP. My analysis provides support for critical approaches to IP regimes based on 'conflicts-of-interest' theories of institutional change that follow the Weberian and Marxist traditions.

Generalizations

At this point, we can explore possible generalizations of the theory of institutional change in IP presented in this book. Based on the case of South American soybean agriculture, I identify two necessary conditions for a permissive IP regime: strong institutional and economic links between the state and knowledge-users; and a strong mobilization of knowledge-users around IP issues. The other side of the coin is that weak institutional and economic links between the state and knowledge-users and weak mobilization of knowledge-users are necessary conditions for a restrictive IP regime. State-led competition in the provision of technology seems to be a distinctive condition of restrictive IP regimes of the neodevelopmental variety. It would be problematic to go beyond this in identifying necessary and sufficient conditions for specific institutional outcomes. At different junctures, certain conditions seemed to be more crucial than others and which condition was the most crucial varied from one

period to another. Furthermore, my conclusions are based on the comparative-historical analysis of three countries over two decades (technically implying six analytical cases) but with only one national case for each ideal-typical IP regime.

The causal mechanism and ideal-types of IP regimes formulated in this study should not be taken as law-like statements with universalist pretensions but can serve as starting points for analyses of other countries and industries. At this point, the reader can better understand some generalizations that were anticipated in the introduction: first, the importance of the economic dependence of the state on a specific industry to explain state behavior toward foreign actors operating in that industry (from the dependence of the Argentine state on taxes on soybean agriculture leading to its resistance against Monsanto to the dependence of the Bolivian state on hydrocarbons leading to nationalizations in Bolivia); second, the relevance of institutional links between the state and knowledge-users to explain the level of protection for private IP rights (from corporatist rule-making within CONASE leading to weak protection for IP in Argentine soybean agriculture to the exclusion of civil society from the formulation of ACTA leading to overprotection of IP); and third, the significance of transnational competition between developing countries in explaining the terms under which foreign capital operates in them (from driving up standards for IP protection in South American soybean agriculture to lowering labor standards and holding back environmental regulations elsewhere).

Such generalizations, however, should be contingent upon aspects that might distinguish soybean agriculture from other industries where IP is a contentious issue. One is the export-oriented nature of South American soybean agriculture, which turned this industry into an easier site for the reproduction of the global trend toward stronger IP by making transnational competition more acute. In fact, the industry where knowledge-users have arguably obtained the most significant victories in disputes with IP-holders has been pharmaceuticals, where the primary concern of governments from developing countries and NGOs has been their domestic markets and patients. Another peculiarity of soybean agriculture is the fact that in none of the three countries analyzed did an alliance between soy growers, NGOs and rural social movements emerge, in spite of their shared criticism of the control of genetic resources by transnational

corporations. The main reason is the overall opposition of NGOs and rural social movements to soybean agriculture because of its export orientation, capital-intensive production and environmental implications. This is another condition distinguishing soybean agriculture from the case of pharmaceuticals. In the latter, the pharmaceutical industry of developing countries sided with NGOs in the fight against the IP rights of transnational pharmaceutical corporations, creating a stronger and broader coalition. Also, some objects of IP rights might be more suitable than others for the development of a compelling public discourse in favor of knowledge-users. NGOs and governments of developing countries can speak on behalf of poor patients that cannot afford medicines because they are protected with patents. In Argentina, soy growers did raise issues of food sovereignty in their IP claims but the fact that most of their product is exported and not directly used for human nutrition might have made their case less convincing.

The above remarks assume a positivist form of generalization from a sample of cases to their universe. There is, however, another form of generalization that has so far been implicit in this study. It goes from parts to whole. Throughout the book, I showed how changes in IP regimes in South American soybean agriculture (the parts) were constitutive of the post-1980 global trend toward stronger IP (the whole). I used the puzzling case of South American soybean agriculture to reformulate existing hypotheses and extend our understanding about the global upward ratchet of IP protection.

This book also carries lessons about the governance of the global agri-food system. There is growing concern among scholars and organizations of the civil society with the increasing control of transnational agri-food chains by giant corporations like Cargill, Nestle, Kraft and Wal-Mart. Like supply-chain contracts, private standards and certifications, private IP regimes can be means for these corporations to govern the production, distribution and consumption of food world wide. Because of their monopolistic nature, private IP rights – from patents to trademarks – have been especially instrumental in the current oligopolization of our food system. My study of Monsanto's system of royalty collection showed how the predominance of transnational corporations in the governance of agri-food chains can be based on coercion and co-optation, reducing the legitimacy of governance and leaving it prone to conflicts. It is

not by accident that the only case analyzed in which the global trend toward stronger IP was tamed is the country where IP rule-making was more embedded within the state as opposed to privatized (Argentina).

Future scenarios

In light of the theory of institutional change in IP presented here, it is possible to identify international and national processes that are likely to shape IP regimes in South American soybean agriculture in the near future. The broadest processes are the terminal crisis of US hegemony (Arrighi 2010) and the rise of Asia as a center of accumulation of capital and power in the world system. Latin America has experienced both a decline in the influence of the US (Crandall 2011) and growing economic relations with China (Gallagher and Porzekanski 2010) and the Global South. In this context, the capacity of the US to coerce developing countries to strengthen their IP regimes is likely to diminish, increasing the policy space for reforms that enhance the rights of knowledge-users in the Global South. As South American countries shift the orientation of their economic activities from the Global North to the Global South, US trade sanctions and conditionalities on foreign loans – instruments widely used in the 1990s to obtain concessions from developing countries in IP negotiations – will become less effective.

Moreover, China is more likely to side with other developing countries in the resistance against stronger IP regimes than to become an advocate for stronger IP protection in the near future. From the perspective of core countries, the Chinese IP regime is too permissive. Like Argentina, Brazil and Paraguay, China has been pressured by the US to reform its legislation and enforcement practices (Mertha 2005). As pointed out by a *New York Times* editorial, ‘stringent protection of foreigners’ intellectual property is at odds with China’s development strategy. Foreign companies operating in China complain that Beijing views the appropriation of foreign innovations as part of a policy mix aimed at developing domestic technology.’ (New York Times, 23 December 2010).

In this conjuncture, the potential for effective cooperation between countries of the Global South in IP seems stronger than it was in the 1970s, when IP demands from developing countries inspired by the

project for a new international economic order were suppressed by a neoliberal counter-offensive launched by the US government. At the very least, the potential is higher than it was in the 1980s and 1990s, when TRIPS and UPOV 1991 were being negotiated. In fact, Brazil, China, India and other developing countries have already jointly opposed the most recent initiative of core countries to strengthen the global IP regime – ACTA.

In the case of South American soybean agriculture, relations with China might help ‘swing back the pendulum’ of IP protection. There have been attempts by Chinese importers of soybeans to bypass the intermediation of American and European transnational corporations in the international trade and industrialization of soybeans. In 2006, the Brazilian Mercantile and Futures Exchange started to develop a new form of contract that would allow Chinese buyers to purchase soybeans directly from Brazilian rural producers without the intermediation of trading companies or transnational corporations (Portal do Agronegócio, 30 August 2006). In 2011, Chinese investment plans in Brazil were announced – including soybean crushing facilities, docks and silos – to put an ‘end to intermediation by US multinational companies’ (Mercopress, 16 August 2011). Chinese companies have already become major suppliers of (cheaper) glyphosate to South American rural producers after Monsanto’s patent on the herbicide expired. If the Chinese can displace transnational corporations from core countries in the international trade of grains and in the supply of herbicides, they could also help South American countries regain control over the generation and distribution of seed technology.

A major avenue for this could be collaborative research projects between Chinese and South American state agencies. This is particularly important because the ‘size of the Chinese R&D enterprise in GM technology is substantial, comparable to that of the multinationals’ (Fukuda-Parr 2007: 213). In China, the public sector dominates R&D in agricultural biotechnology and seed prices are kept low because R&D is publicly financed (Fukuda-Parr 2007: 204). In 2004, EMBRAPA negotiated a cooperative research project on soybean genetics with the Chinese Academy for Agrarian Sciences with the goal of increasing yields in cultivation (Valor Econômico, 15 September 2004). It involved sharing costs, knowledge and genetic material. In April 2011, EMBRAPA opened a virtual laboratory in

China coordinated through the Brazilian Embassy in Beijing to promote collaborative agricultural research. These incipient collaborative projects have the potential to reduce the control of seed technology by US and European corporations.

Nevertheless, the growing capacity of China in agricultural biotechnology might lead to the emergence of a neodevelopmental IP regime characterized by stronger protection for IP in that country. Yet, the opposition of the Chinese state to higher international standards for IP protection and its concern with domestic food security and social stability in the countryside might sustain a preference for a weak IP regime that allows Chinese farmers access to cheap seed technology. As with other issues crucial for Latin American development, a delicate balance needs to be pursued so that Latin Americans can benefit from relations with China without falling into another situation of dependency.

Another aspect of the transnational dimension of IP regimes in South American soybean agriculture that can shape future developments is transnational competition between actors from Argentina, Brazil and Paraguay for foreign technology. This would become especially important if Monsanto releases new technology in Brazil and Paraguay but not in Argentina. A possible consequence would be that the Argentine IP regime would be finally strengthened to allow Argentine soy growers regular access to new varieties of seeds. This outcome is more likely if the Argentine state continues to increase funds available to INTA, causing the country to converge to the neodevelopmental path pursued by Brazil. The global trend toward stronger IP regimes would then be fully reproduced in South American soybean agriculture. However, the Argentine IP regime might not be strengthened despite the release of new plant varieties exclusively in Brazil and Paraguay. The recent re-approximation of the Kirchner administration to organizations of small and medium rural producers could increase their power to constrain reforms to the Argentine IP regime.

If seeds of new GM varieties are smuggled into Argentina and start to be illegally cultivated in the country, a whole new series of conflicts will probably emerge as Argentine rural producers could be interpreted as 'free-riders' by soy growers from other countries and Monsanto. One could also consider the possibility of Brazilian and Paraguayan rural producers rebelling together against Monsanto

after seeing Argentine soy growers benefit from cheap technology for decades. Nonetheless, this study has shown that the transnationalization of soy growers as a class, which can be seen in the presence of 'Brasiguaios' in Paraguay and in the operations of Argentine firms such as *Grupo el Tejar* and *Los Grobo* in Brazil, has not yet led to a transnationalization of their political representation and mobilization around IP. The Federation of Rural Associations of MERCOSUR and ISGA (the International Soy Growers Alliance) did not perform a significant role in IP disputes and did not serve as a platform for concerted action on the part of soy growers from the three countries vis-à-vis Monsanto. The mobilization of rural producers around IP has been circumscribed to national boundaries, with different patterns from country to country. At this point, the process of transnational class formation that Robinson (2008: 61–2) saw in the expansion of the nontraditional agricultural export sector in Latin America is at best incomplete. However, the incipient collaboration between APROSOJA-RS (Brazil) and APS (Paraguay) in lawsuits against Monsanto suggests the potential for a transnational coalition of South American soy growers against the corporation. If EMBRAPA eventually loses its capacity to promote competition in the Brazilian soybean seed market and royalty values increase, then Brazilian soy growers will be more likely to side with their regional neighbors and rebel against seed companies.

In sum, at the present time there are social forces that operate toward the reinforcement of the global trend toward stronger IP regimes in South American soybean agriculture but also forces that work for its reversal. The future path of institutional change will depend on the strength of each of the 'seeds of change' discussed above and on how they will be combined. In the next section, this prospective analysis is extended to account not only for 'where things seem to be going' but also for 'where things could be going' because of the creative agency of soy growers and government actors in Argentina, Brazil and Paraguay.

Normative issues and policy implications

The starting point for an evaluation of possible courses of action should be a statement of the goals to be pursued on behalf of the public good. An IP regime should strike a balance between the rights

of IP-holders and the rights of users of IP goods, ensuring the widest possible diffusion of technology while 'buying off' innovators at the minimum possible cost (Chang 2001: 298). After more than three decades of a global upward ratchet of IP protection, there is growing recognition that our international IP regime is overprotecting the rights of IP-holders with negative consequences for social welfare. Among the worst consequences are higher inequality and less innovation (Stiglitz 2013a; 2013b). We can therefore assume that the relevant evaluation to be made is about strategies that would enhance the rights of knowledge-users, especially those in developing countries, without eliminating incentives for innovation. In any case, if we take IP as tool for development, we should understand that 'development is fundamentally a political matter and that it is illusory to conceive of good governance [of IP, in our case] as independent of the forms of politics and type of state which alone can generate, sustain and protect it' (Leftwich 1994: 363). Specifically, my approach strongly questions 'one size fits all' policy recommendations regarding IP that are often put forward by the seed industry and some international organizations, with the 'one size' usually meaning stronger protection for private IP.

My theory of IP regimes suggests that transnational cooperation between state agencies in public R&D and between associations of knowledge-users in IP politics can help revert the global trend toward stronger IP. In the case of South American soybean agriculture, this would minimize the negative effects that transnational competition has had over the bargaining power of rural producers vis-à-vis large seed companies. IP conflicts in South American soybean agriculture have been an asymmetrical game in which a single transnational corporation applies the same tactics in the face of a number of rural producers' associations and state agencies dispersed in three countries. There is no significant transnational cooperation between rural producers' organizations in IP and even their knowledge about IP conflicts in neighboring countries does not go beyond what is made available in the press of their respective countries. South American rural producers could gain a lot simply by sharing information and expertise in IP across national borders (not to mention by coordinating their responses to pressures from foreign seed companies). Regarding cooperation between public R&D agencies in MERCOSUR, the case of Brazil shows that a strong, public agricultural

R&D sector can help offset the control of foreign transnational companies over seed technology. Although in Brazil this was associated with a strengthening of the IP regime, a stronger role of the state in the provision of plant technology is not incompatible with assuring that at least small rural producers retain the right to save and exchange seeds as a way to tame the power of corporations and for matters of agro-ecology. Because not every country can afford a state-owned corporation like EMBRAPA, strengthening cooperation between public agricultural R&D agencies in MERCOSUR is a very strategic venture (especially for Paraguay, where a dependent IP regime prevails).

My approach to IP regimes also suggests that changes in the patterns of IP rule-making and in the patterns of mobilization of knowledge-users within countries could be effective in preventing an overprotection of private IP rights. Concerning the former, rural producers – and knowledge-users in general – should seek the creation of permanent institutionalized spaces for negotiations regarding IP. In the formulation of national IP regimes, this can take the form of corporatist committees with members representing associations of knowledge-users. In the design of international IP regimes, this could involve the participation of civil society organizations as observers and consultants in negotiations of IP treaties. It also means that interstate negotiations should be open and democratic, with governments of developing countries participating in the drafting of proposals from the beginning instead of being invited for talks only after a minimum consensus was already reached between a small group of core countries. In the formation of transnational IP regimes, this could be achieved through multi-stakeholder initiatives involving all relevant actors in an open, transparent and consensus-based decision-making process.

The same principles should be applied to rules about biosafety. Although this book focused on the making of IP rules, the production, distribution and use of agricultural biotechnology and agrochemicals is also subject to biosafety policies. For agricultural biotechnology to have a wide positive impact on the economy, society and the environment, these policies need to be formulated through rigorous and transparent processes. Just like IP policies, biosafety rules should not be shaped exclusively by the interests of transnational corporations.

In relation to the mobilization of knowledge-users around IP, organizations representing their interests should emulate the strategies and forms of organization developed by Argentine rural producers: a broad framing of IP claims to include issues of national and public interest, the coordination of actions on a national scale and the presence of independent channels for the expression of the interests of knowledge-users most sensitive to IP issues. For South American rural producers, this would involve raising issues of national sovereignty and food security and allowing small-holders to manifest their opinions independently.

At this point, we can discuss the contradictions, limits and possibilities of old and neodevelopmental IP regimes in the promotion of social welfare. An exclusive concern with the enhancement of the rights of knowledge-users can result in the problems associated with old developmental IP regimes. As pointed out by Basant (2010: 2), 'an evaluation of the IP regime and regulation in developing countries needs to be done in the context of how they facilitate capability building especially through participation of domestic firms in global R&D and production networks'. Old developmental IP regimes focus on the rights of knowledge-users and on imitation of foreign technology as a method of technological catching-up. In the long run, however, it is important to move from prioritizing cheap access to foreign technology to converting local knowledge-users into knowledge-producers. Cheap access to foreign technology can help knowledge-users become knowledge-producers only if it involves learning and the creation of indigenous technological capacity.

In Argentina, the right to save seeds is extended to all kinds of soybean producers. This means that not only small-holders but also large companies operating soybean plantations appropriate economic benefits from seed technology that would otherwise accrue to seed companies (including local firms). If the Argentine law of seeds is changed in such a way that small and medium rural producers retain the right to freely save seeds but large rural producers and *pools de siembra* have to start paying royalties over saved seeds, we will see a transfer of economic surplus from large holders to seed companies. This transfer could increase funding to the R&D of new plant varieties not only by transnational corporations but also by local firms and public agencies. This transfer is to some degree already performed by the state when it charges progressive export taxes on soy growers

and uses part of the revenue to fund public agricultural R&D at INTA. If the change in the law of seeds is paralleled by agreements between foreign companies and local actors ensuring that part of royalty revenues will be used to promote indigenous technological capacity, the results will be better. A law establishing that a share of taxes charged on agricultural exports would be used to fund public agricultural R&D would also be an improvement and could help tame the resistance of rural producers against export taxes.

With these changes, Argentina would converge toward the Brazilian neodevelopmental model that has been associated with increasing indigenous technological capacity. This could bring benefits but also disadvantages. When EMBRAPA uses part of the revenue from royalties paid by soy growers to fund research focusing on family agriculture it is ameliorating the distribution of costs and benefits of soybean production, an activity associated with concentration of land, environmental degradation and threats to food security. Nevertheless, it is not clear that the strengthening of the Brazilian IP regime has been fully compensated by technological transfer on the part of foreign companies. The contract between Monsanto and EMBRAPA was negotiated behind closed doors and the share of Monsanto's royalties that is transferred to EMBRAPA is very small in proportion to the profits made by the corporation in the country. Moreover, not only large but also small-holders producing GM soybeans in Brazil pay royalties on saved seeds. They have also faced occasional abuses by Monsanto.

Therefore, Brazil and Argentina should learn from each other to avoid their respective pitfalls and help Paraguay overcome its technological dependency. Paraguay is one of the poorest countries in Latin America. In this country, low taxes on export-oriented agriculture and a high concentration of land ownership have meant that wealth generated in agribusiness hardly trickles down to the population at large. The foreign control of agricultural biotechnology entails that royalties paid on GM seeds are appropriated by transnational seed companies, which use only a small fraction of those resources to foster indigenous R&D capacity.

Finally, one limitation affects all three models of IP regimes found in South American soybean agriculture. When the IP regimes of Argentina and Brazil are characterized as developmental, this is based on a notion of development as fundamentally a process of economic

catching-up between peripheral and core regions of the world system. However, the absence of a joint mobilization of soy growers, NGOs and rural social movements around IP issues suggests that under a broader conceptualization of development the IP regimes of Argentina and Brazil might not actually be developmental. From the point of view of NGOs and rural social movements, these regimes are part of the institutional framework of an activity that is substantially irrational because of its adverse social and environmental effects. NGOs and rural social movements have a critical view of the very idea of private IP rights on seeds. While soy growers demand legislation and policies that limit the IP rights of transnational seed companies, they accept the idea that knowledge and nature can be objects of private property and often affirm that private R&D investment should be properly compensated. Conversely, NGOs and rural social movements emphasize the communal and traditional nature of knowledge embodied in plant varieties.

In light of this, we should foster public agricultural R&D *and* the practice of saving seeds by small-holders as means to promote competition in the provision of seed technology. Ultimately, this will curb the overgrowth of the commercial seed system, which has happened to the detriment of the traditional seed system and of the public domain in agriculture. Our society should not rely exclusively on the commercial seed system – with its emphasis on private IP – to produce food in ways that are economically, socially and environmentally efficient. This system is prone to oligopolization, rent-seeking and the neglect of ‘orphan crops’.² The challenges of global food security and environmental sustainability require a flexible seed system that balances private IP rights with protection to communal property and the public domain as sources of innovations.

Appendix – List of interviews

Argentina (Buenos Aires, August 2010)

ARPOV – Argentine Association for Protection of Plant Varieties
ASA – Association of Argentine Seed Companies
CONINAGRO – Intercooperative Confederation of Agriculture and Livestock
FAA – Argentine Agrarian Federation
INASE – National Institute of Seeds
INTA – National Institute of Agricultural and Livestock Technology
SAGPyA – Secretariat of Agriculture, Livestock, Fishery and Food (Miguel Campos, former head of SAGPyA)

Brazil (several locations, 2011–2012)

ABRANGE – Brazilian Association of Producers of Non-Genetically-Modified Grains
APROSOJA-MT – Association of Soy Growers of Mato Grosso
APROSOJA-RS – Association of Soy Growers of Rio Grande do Sul
ASPTA – Assistance and Services to Projects in Alternative Agriculture
EMBRAPA – Brazilian Corporation for Agricultural and Livestock Research
FARSUL – Federation of Agriculture of Rio Grande do Sul
FETAGRS – Federation of Agricultural Workers of Rio Grande do Sul
SNPC – National Service for Protection of Cultivars, Ministry of Agriculture

Paraguay (Asunción, March 2011)

APROSEMP – Association of Seed Producers of Paraguay
APS – Association of Soy Growers
CAPECO – Chamber of Exporters of Grains and Oilseeds of Paraguay
CERI – Center of Interdisciplinary Rural Studies
IICA – Inter-American Institute for Cooperation on Agriculture, Office in Paraguay
INBIO – Institute of Agricultural Biotechnology
IPTA – Paraguayan Institute of Agricultural Technology
PARPOV – Paraguayan Association of Plant Breeders
SENAVE – National Service for Plant and Seed Quality and Health

Notes

1 Introduction

1. For an extensive discussion of the concept of the public domain from different perspectives, see Drache (2001).
2. Following Brousseau and Rossi (2009: 2), I use the term 'IP regime' to refer to institutional arrangements that include not only state-designed IP laws but also private contracts and enforcement practices.
3. Here, an IP regime is considered strong or restrictive when it provides strong protection for the rights of IP-holders, making access to knowledge on the part of knowledge-users more restricted. An IP regime is weak or permissive when it provides stronger rights for knowledge-users, making access to knowledge easier.
4. The advantage of RR soybeans is their resistance to glyphosate, which is less expensive, less toxic and easier to apply than other herbicides used on conventional soybeans. The easier management of RR soybeans also favors the use of non-tillage sowing methods, which are more efficient and cause less erosion to the soil.
5. Soy is an autogamous plant, meaning it can reproduce through self-fertilization. Autogamous plants generate seeds that keep their agronomic qualities from one generation to another, which allows rural producers to save seeds. Hybrid seeds (such as hybrid maize) do not keep their qualities from one generation to another, forcing rural producers to purchase new seeds every year. As long as farmers can save seeds, they are independent from (and actually can compete with) seed companies.
6. See, for instance, Drahos (2002), Sell and Prakash (2004), Shadlen, Schrank and Kurtz (2005), Shadlen (2009), Deere (2009) and Shadlen and Haunss (2009), Muzaka (2011).
7. The term 'South American soybean agriculture' refers here to Argentina, Brazil and Paraguay. Although this activity has been present in other countries of the region, Argentina, Brazil and Paraguay account for virtually all of soybean production in South America (97.5 per cent from 2008 to 2010 based on data from FAO).
8. Article 27 of TRIPS states that members may exclude from patentability '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.' UPOV was created in 1961 to provide an effective system of plant variety protection based on plant breeders' rights. The convention was amended in 1972, 1978 and 1991.

9. Other restrictions introduced by the UPOV act of 1991 were the extension of the minimal protection time for most species from 15 to 20 years (delaying the entrance of plant varieties into the public domain) and the discretionary nature of the right to save seeds. The right was implicitly guaranteed in the 1978 convention but became optional in the 1991 version so that signatory states could restrict it to 'reasonable limits' to protect the 'legitimate interests' of cultivar owners. Cultivar is a plant variety that originated naturally or by scientific methods and persisted under cultivation.
10. Some elements of Monsanto's IP regime for South American soybean agriculture are also found in the company's business practices elsewhere. In the US, soy growers that purchase seeds from Monsanto have to sign contracts abdicating the right to save seeds and allowing their farms to be inspected by the company. In South America, these elements and others were assembled in a more systematic way, including the collaboration of actors in other segments of the commodity chain to enforce the collection of royalties. The implementation of the system involved the acquiescence of some associations of rural producers and, later, its operation prompted the resistance of other associations of farmers, who initiated collective actions against the system as a whole.
11. For the influence of business actors, see Sell 2003; for the influence of NGOs and social movements, see Matthews 2011.
12. Compulsory licensing is when a state allows someone to produce a patented product or process without the consent of the patent owner.
13. I conducted interviews with state officials, representatives of rural producers, of the seed industry, of the crushing industry, of NGOs and rural social movements, and with experts in IP and in soybean agriculture in Argentina, Brazil and Paraguay from June 2009 to July 2011. All interviewees agreed that the content of the interview would be used for the purposes of this research. However, because interviews were about the experience of organizations (not of individuals) in IP conflicts or policy-making, references to interviews throughout the book mention only the name of organizations. Personal names are mentioned exceptionally, when the information provided by the interviewee had been previously made public. A list of the organizations visited for interviews is provided in the Appendix.

2 Argentina: The Old Developmental Model

1. Cultivar is a plant variety that originated naturally or by scientific methods and persisted under cultivation.
2. On 19 April 1996, Adelaida Harries presented a paper at a meeting held in Rome about the protection of plant varieties in which she proposed these changes. The paper, entitled 'Por qué cambia el Convenio de la UPOV? La Evolución del Convenio a raíz del Acta de 1991', was later published in Cascardo, Gianni and Piana (1998).

3. The history of Monsanto in Argentina started in 1956, when the company opened a factory in Buenos Aires for the production and commercialization of chemical products for the plastics industry. In 1978, Monsanto entered the Argentine seed industry opening a facility in Pergamino to produce hybrid sunflower seeds. In the 1980s, the factory in Buenos Aires started to produce the Roundup herbicide later used on RR soybeans. The company also came to supply transgenic cotton and maize for Argentine rural producers (Monsanto's institutional website for Argentina, retrieved 18 January 2013).
4. In this proposal, the right to save seeds with no royalty payments is restricted to rural producers operating on subsistence level and low-income small holders (see Rapela and Schötz 2006).
5. *Pools de siembra* are companies or investment funds that bring capital from the financial and urban sector to rent land, hire machine contractors and take advantage of economies of scale. They became one of the most active and influential actors of the Argentine business sector (Reveles 2008: 17). If needed, these organizations can purchase land to exploit it and sell it later, but typically they rent. They hire people to work permanently or temporarily and can move across provinces and even across countries.
6. In 2008, Congressman Miguel Bonasso presented a legislative proposal (6376-D-2008) that prohibited the use of 'terminator' technologies.

3 Brazil: The Neodevelopmental Model

1. The commercialization of cultivars developed under the second exception is limited by the rules that apply to 'essentially derived varieties'.
2. Data for the period from 2002 to 2011 retrieved from the ABRASEM website (<http://www.abrasem.com.br>; retrieved 24 January 2012).
3. This is also explained by factors other than the adoption of the RR technology, such as the expansion of the agricultural frontier and new methods of production.
4. For a study of the participation of developing countries in international negotiations about cotton and their implications for development, see Lee (2007). For a comprehensive analysis of how international rules, non-governmental policy advocacy and corporate social responsibility in the cotton industry have enabled poverty reduction and poverty reproduction in the developing world, see Sneyd (2011).
5. In 2010–2011, estimates indicate that 76.2 per cent of the area cultivated with soybeans in Brazil was sowed with RR seeds (APROSOJA-MT 2011).

4 Paraguay: The Dependent Model

1. In Brazil, however, the commercialization of cultivars developed under exception (2) is restricted by rules about 'essentially derived varieties'.
2. Data provided by APROSEMP during an interview with the author in Asunción in March 2011.

3. The proposal (collected during fieldwork in Asunción in March 2011) is entitled *Acuerdo marco sobre incorporación de biotecnología agrícola* and was signed by CAPECO, APROSEMP, CAP, FECOPROD and APS.
4. Eight-page document signed by Enrique Grazzini (Monsanto's manager of technological licensing), entitled *Acuerdo Marco* and collected by the author during fieldwork in Asunción in March 2011.
5. Letter addressed to Enrique Grazzini and Alberto Barbero (executives from Monsanto), signed by CAPECO, APROSEMP, CAP, FECOPROD, APS and UNICOOP (collected during fieldwork in Asunción in March 2011).
6. Letter addressed to Enrique Grazzini and Alberto Barbero (executives from Monsanto), signed by CAPECO, APROSEMP, CAP, FECOPROD, APS and UNICOOP (collected during fieldwork in Asunción in March 2011), p. 1.

5 Conclusion: Seeds of the Future

1. Personal observation by the author of a presentation given by Carlos Casamiquela, president of INTA, at the conference *Intercambio sobre Buenas Prácticas y Lecciones Aprendidas en la conducción y desempeño de los INIAS de la región Sur*, held by IICA in San Lorenzo, Paraguay, on 25 March 2011.
2. The term 'orphan crops' is very symbolic of how small holders have been excluded from a global agricultural R&D and IP system dominated by transnational corporations from core countries. It refers to crops that are vital for subsistence farms in the Global South and have potential to nourish the world but that are under-researched and under-supported.

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