

# Intellectual Property Protection and the International Marketing of Agricultural Biotechnology: Firm and Host Country Impacts

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## Introduction

The protection of intellectual property rights (IPR) has been a contentious issue over the last 20 years. Industrialized nations have moved to knowledge-based economies and simultaneously trade barriers have fallen, making intellectual property (IP) vulnerable. Adding to this vulnerability are conflicting international institutional environments, belief systems, and economic realities. The debate over IPR protection has become a significant global trade issue pitting the net-technology producing North against the net-technology consuming South. The North has a distinct belief system towards IP (Steidlmeier, 1993; Mittlestaedt and Mittlestaedt, 1997), maintains a comprehensive IPR institutional environment, and actively employs enforcement mechanisms. The South on the other hand, is more conflicted. While in the last ten years many Southern countries have agreed to multilateral agreements on IPR protection, enforcement and real commitment has been lagging (Thurow, 1997; Levy, 2000).

With this in mind there has been much debate about the impact of alternative IPR regimes (tight or loose) on the welfare of Southern economies. Policy makers in both the South and the North search for arguments to convince recalcitrant Southern countries to follow the Northern model of strict IPR regimes. The South faced with a dilemma, searches for arguments to justify loose IPR regimes or alternatively to convince its populace that tighter IPR regimes are better for the nation.

While there has been much analytical work, mostly theoretical, conducted on the subject, the final results are inconclusive whether a strong IPR regime is better or worse for Southern countries (Vishwasrao, 1994; Sherwood and Braga, 1996; Globberman, 1998). The lack of clarity

as to the impact of IPR regime has been due to both the complexity of problem and the form of analysis. The theoretical models while being extremely valuable highlighting the drivers of firm and social welfare are by their nature abstractions.

Writing in a 1993 survey of the empirical work to date, Helpman (1993) concludes that there exists very little evidence on the welfare effects of international infringements of IPRs. Similarly, writing in 1994 Maskus and Konan remark that there is a surprising paucity of empirical evidence concerning the most critical issues at hand. Subramanian (1995) echoes the sentiments of the lack of quantitative estimates of the Southern welfare impacts. Therefore, on the topic of understanding the phenomenon of North-South welfare impacts, the empirical attempts have not been much more successful than the theoretical models.

The empirical models to date suffer from three effects that weaken the impact of their conclusions. The first is that often firms are not able to observe their losses from weak IPR (Fienberg and Rousslang, 1990). Many times the losses are due to investments not made and need to be estimated. (Host country impact analysis too suffers from this problem.) Second, firm impacts are generally estimates from surveys of a cross section of firms, representing opinions of impact, not factual evidence (Evenson, 1990; Sherwood, 1990; Braga and Willmore, 1991; Fienberg and Rousslang, 1991). Finally, no work to our knowledge has attempted to directly measure firm and host country impacts from weak IPRs. Therefore while there has been some attempt to empiricize welfare impacts, evidence supporting or negating the theory is lagging. The end result for policy makers is there still remains much ambiguity and economic studies have yet to show where the balance should be struck (Alster, 1988; Dawson, 1987).

The objective of this research is to add some empirical clarity of the welfare impacts of

weak IPR. To this end we employ a novel methodological design and a unique context. While previous studies have used cross-sectional survey or secondary data, our research employs the critical case study approach (see Yin, 1994). The research design is deductive, in that we use the empirical setting of Pioneer-Argentina, S.A., a seller of bioengineered agricultural seeds, to test the existing theory of weak IPR impacts in a North-South context.

## Theoretical Background

The dilemma, both domestically and internationally, for IPR protection is the trade off between short-term costs and long-term benefits. The argument made by Northern countries is that while prices may rise in the short run, new technologies will be available over the long term and will, in turn, raise economic productivity (Stamm, 1993). As the result of protected property rights, the South will gain from new investment (Sherwood and Braga, 1996), the flow of technology (Sherwood and Braga, 1996), and technology spillovers (Zigic, 2000). The preferred mechanism of IPR protection by the net technology producing countries (North) is through public institutions, not product/process masking by private firms. For the net technology using countries (South) the significant short term costs may arise directly from an increase in the cost of the input due to the lack of complete substitutes and indirectly from the administrative and enforcement costs of a Northern style IPR protection system. Adding to the complexity is the fact that welfare impacts are best understood in a dynamic context, as the short-term losses of strengthening the South's IPR regime are believed to be trumped by the long-term gain from economic growth.

To address the complex question about the welfare impacts of an IPR regime, numerous theoretical models have been developed (Dollar, 1986; Chin and Grossman, 1988; Diwan, 1991;

Deardorff, 1992; Helpman, 1993; Taylor, 1993; Maskus and Konan, 1994; Grossman and Helpman, 1995; Zigic, 1998). While it is generally agreed that technology is important for an economy to grow (Dollar, 1986), the theoretical models are not completely successful making the argument that IPR protection in the South improves Southern welfare (Zigic, 2000; Gould and Gruben, 1996; Helpman, 1993; Chin and Grossman, 1990). Additionally, the argument that strong IPRs lead to greater innovation too is questioned (Gould and Gruben, 1996; Braga and Willmore, 1991). The lack of clear benefits from IPR production can be due to a fundamental difference in belief systems about private versus communal property (Steidlmeier, 1993; Mittlestaedt and Mittlestaedt, 1997; Thurow, 1997; May, 1998), the negative affects of a monopolist on future innovation (Chin and Grossman, 1990; Gould and Gruben, 1996; and Zigic, 2000), a “tit for tat” view in which the South is “owed” the technology based on a history of Northern resource extraction policies, or the South’s assessment of the extreme hardship an enforced patent system would create. Whether it is an intrinsic skepticism about Northern property right regimes or a skepticism based on the realities of the moment, the end result is recalcitrance on the part of Southern countries to actively engage IPR protection.

## Theoretical Propositions

The theory of welfare and IPR protection hinges on its theoretical propositions about how weak IPR in the South effects the welfare of firms, consumers, and Southern countries as a whole. Our research has identified nine propositions worthy of empirical analysis. In this paper we select one in particular on which to focus: IPR and host country investment. This topic captures the complexity of how the host country and the firm are impacted.

Proposition	Weak IPR reduces investment in the South. Stamm (1993) refers directly to investment and its diversion away from the South to the North.
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Vishwasrao, 1994; Globerman, 1988; Mansfield, 1994; Sherwood, 1990; and Benko, 1987 refer to lowered R&D spending in the South, and Chin and Grossman (1990); Mansfield (1994); Helpman (1993); Benko (1987); Diwan & Rodrik (1991) hypothesize about how innovation is stifled in the South. Zigic (1998) raises the issue of welfare spillovers. The effects on investment are critical components of the indirect impacts from weak IPR and are necessary for conducting benefit-cost tests. For example, a loose IPR regime might cause a firm to avoid a country. The country not only loses by not having access to the latest technology, the firm would also be withholding investment in the country in support of the innovation. These are the “pebble in the pond” effects from introducing a new product into a market. They generally do not arrive in a limited fashion but can have broad indirect impacts on the economy. To empirically measure these ripple effects, our case study compares the relative levels of R&D, investment (human (Sherwood, 1990) and physical capital) between Pioneer units whose IP is affected against those whose IP is unaffected by Argentina’s weak IPR regime.

## Methodology

### *Introduction*

The subject of our study is the firm Pioneer- Argentina. Pioneer is a subsidiary of the multinational division Pioneer Hi-Bred International that is part of Dupont de Nemours.

Pioneer-Argentina is in the business of producing and selling agricultural seed to farmers. Total sales for 2000 were \$35 million and the firm employs 105 people. The firm sells a variety of cultivars (Figure 1), but their dominant business is corn and soybean seeds. Herein lies the uniqueness of the empirical setting and its value for addressing the question of the welfare implications of IPR protection.

Corn and soybeans are complements. Agronomic convention holds that neither corn nor soybeans be grown in the same field in a continuous fashion. A producer may be able to get away with two years of continuous rotation but beyond that soil fertility suffers and weed and

disease impacts increase. Therefore corn and soybeans are grown in rotation with 50% of a farm's acreage in corn and 50% in soybeans. In any given year though relative prices and input costs may provide an incentive to move away from a 50-50 split, but as mentioned above deviating far from a rotation over a long period of time is not possible. The impact for retail seed suppliers is that offering both corn and soybean seed is a successful strategy as there are very few pure corn farmers or pure soybean farmers. A farmer needs both products. A firm can effectively offer both types of seeds because brands are important and it affords one-stop shopping.

A second feature that makes the case unique and valuable for studying the IPR issue is that Argentinean crop production is very similar to that in the US. The center of the corn and soybean area, e.g. the province of Buenos Aires, is the 32<sup>nd</sup> parallel (south) comparable to the Mid-South region of the US. Thus US varieties and agronomic practices transfer readily to Argentinean producers. This makes the preferences between the North (US) and the South (Argentina) relatively homogeneous. In the year 2000, Argentina cultivated 3,326,000 hectares of corn and 10,300,000 hectares of soybeans (Secretaria de Agricultura, Ganaderia y Pesca (SAGyP), 2000). Argentina is the world's second largest corn exporter (USDA, 1997) and the world's third leading soybean producer (Elliott, 2000).

To produce seed (for the North or South), a firm like Pioneer takes three general strategies. The first (I), involves extensive R&D to develop seed characteristics that can be introduced into adapted and successful existing germplasm. An example would be the development of transgenic events, i.e. Round Ready® tolerance, and then marketing that technology through the best varieties/germplasm. Therefore Monsanto, as an R&D company,

would purchase a company like Asgrow, a producer and marketer of seed, in order to get its technology out into market (Goldsmith, 2001). This would be the high risk-high return strategy that has dominated the life sciences industry over the last decade (Goldsmith, 2001).

A second strategy (II) and more common in markets of developing countries is for firms to take already developed seed varieties and adapt them to the local environment. This still involves significant investment in seed research trials with extensive breeding programs and field plots in the local (Southern) environment. As long as the foreign region is relatively homogeneous to that of the central R&D area of the US, Strategy I is unnecessary and Strategy II suffices. An example of this is northern Brazil where Strategy II is not applicable because of the tropical climate and high aluminum soils (Mcvey *et al*, 2000). Local investment in R&D by EMBRAPA, Brazil's agricultural research system is necessary because direct technology transfers are agronomically inappropriate.

The third strategy (III), involves essentially no investment. A seed company simply exports the seed directly from the North to the South with no adaptation. The more comparable the northern environment is to the southern environment the less likely a crop failure would arise due to poor adaptation. It is important to note that a seed firm can never know with certainty that a variety when taken out of its home region will perform exactly the same in a new region. Ex-ante the firm may be confident, but only after the seed has been purchased, planted and grown does the adaptiveness reveal itself. Thus older varieties are less risky, but represent older technology.

Strategy I (high R&D) is not pertinent to a company like Pioneer Argentina because the agronomic differences are small and market opportunities specific to Argentina are relatively



minor for new technology development. New technologies available to Northern producers in North America and Europe can be successfully introduced in Argentina. Roundup Ready® technology for example is easily introduced into the many local varieties found in the US, Europe and South America.

Pioneer does have a choice between Strategy II (moderate investment) and Strategy III (no investment) and this option is the crux of our empirical approach. Pioneer is world leader in corn and soybean seed production and sale. Farmers in Argentina need both products and Pioneer wants to offer both products. The uniqueness of the situation whereby Argentina agronomically is directly comparable to the US affords a firm like Pioneer the opportunity to choose a Type II or Type III strategy for either the corn or soybean products. They can both be Type II with significant R&D and Argentinean farmers would receive the most advanced technology adapted to their country's environment, or the firm can under-invest and choose a Type III strategy and completely free-ride off of investments made in the North. Corn and soybeans do not have to be treated the same. That is corn can be Type II while soybeans kept at Type III.

As revealed in our interviews with the company, their objective (not surprisingly) is profitability, which can be translated as return on investment (ROI). They are not wed to one strategy or another or matching a product, i.e. corn, with a certain strategy. They clearly expressed that their objective was profitability and the strategy (either II or III) would be used for the division that best achieved those objectives. Therefore as an endogenous choice problem, the corn or soybean divisions could either involve moderate or no investment. *Ceteris paribus*, according to Pioneer management, high investment is preferred to low investment. Thus if business conditions were ideal, the welfare of the firm is greatest under Strategy II, high

investment.

The empirical question of this paper is not why Pioneer chooses one strategy or another, but to compare the welfare impacts of a Type II strategy versus a Type III strategy. In order to effectively perform the welfare analysis, a comparative case is valuable. In the Pioneer situation what are the benefits and costs for both the firm and the host country of the high investment decision and what are the benefits and costs of the low investment decision?

A final unique and valuable feature of this case is the cross-country differences in institutional environments are controlled. This is because even though Pioneer's strategic choice is driven by IP concerns and Argentina has a weak IPR regime, corn is agronomically protected from IP piracy and soybeans are not. Therefore our methodology controls for the property rights environment, the market structure, and demand (farmers). The reason that the corn division can be operated differently from the soybean division is that corn is a hybrid and soybeans are not. A corn plant is pollinated only by means of another corn plant. If corn seed is saved from one year to next, the corn plant loses its hybrid (cross-pollination) vigor and performs very poorly. Therefore a farmer must return each year to the seller of seed to get a new version of the hybrid that has been properly crossed.

Soybeans on the other hand are self-pollinating and can keep reproducing in perpetuity. A farmer can take seed from the crop just harvested and replant them the following year. In this way a farmer who plants soybeans does not have to return to the seed supplier every year for new seed, dramatically lowering the cost of the seed input. In the US 25% (Hayenga, 1998) of the soybean seed is saved-seed. Most farmers still have an incentive to purchase new seed every year because new varieties perform better. Saved-seed will have a yield drag on average of 2.4%

(Purdue University in Illinois Agrinews, 2001). Also purchased seed tends to be more consistent and reliable. In the last few years an added incentive, in the US and Canada, to purchase soybean seed on a yearly basis has been Monsanto's introduction and enforcement of a grower contract that stipulates that seed can not be saved as it infringes on Monsanto's patent rights (Goldsmith, 2001). Under the weak property rights conditions of Argentina, this last incentive does not exist. Our interviews with farmers and industry representatives in Argentina feel that the yield drag from saved-seed is closer to 1% - 2% per year for them and well worth absorbing, given that seed costs are so much lower. Because of this unique agronomic feature we are able to study Pioneer's behavior where the only difference between the business of selling corn and the business of selling soybeans is that corn's IP is naturally protected while soybean's is not.

### *The Case Study Method*

To explore this unique empirical situation the case study method was selected. The lack of empirical evidence generated by previous methodologies in this area led us to believe that a more microeconomic approach was necessary. The case study method is valuable where depth of analysis is important. The ability to achieve depth is also the case study approach's weakness, in that only "one" observation is being used. In all of the studies mentioned above numerous observations were used and statistically significant results were estimated. As numerous authors have noted though, the application of those results to the phenomena has not been significantly illuminating. The case-study method used in this research greatly narrows the focus with the intent of improving the quality of the empirical evidence. The case study approach's narrow focus and lack of statistical tests are seen as weaknesses as well. Neither broad-based statistical studies nor narrowly focused case studies are the perfect empirical methodology (Yin, 1994;

Westgren and Zering, 1998; Gummesson, 2000). Both have their place and we suggest that case study method when applied to the situation of Pioneer Argentina adds important insights into the North-South debate over IPR protection.

### *Research Design*

As in quantitative research, there are numerous case study methodologies. For the purposes of this inquiry, a deductive approach is employed. That is the case study is used to help provide empirical evidence about a phenomena that to date has been understood from theoretical, anecdotal, and limited empirical perspectives. Yin calls this the critical case study model and is built upon existing theory and guided by specific propositions. Its goal is to test theory instead of creating theory. Specific questions still remain as to how IPR protection actually affects farmers, firms, supply chains, and host countries. Theory, as noted above, abounds about how we think welfare is impacted and the theory yearns for some empirical evidence.

### *Evidence*

The study used the following sources of evidence: key informant interviews, direct observation, and quantitative data (financial documents analysis and industry statistics). To conduct the interviews a semi-structured interview instrument was administered to over 30 key informants representing Pioneer and its various divisions, the Argentinean seed industry, supply chain members, and government (Figure1). Following Kumar (1989) guidelines for rapid appraisal, these interviews were qualitative and directed to carefully selected subjects.

The instrument comprised over 180 questions drawn and organized thematically from the theory. Depending on the informant's role or organization, some of the question might not have been asked. In general questions focused on business operations, investment, and intellectual

property. The theme was always comparing the corn seed business with the soybean seed business. While an attempt was made to introduce the questions in the same order, it was not uncommon for respondents to shift off topic. The interviewers did keep track of those questions that remained unanswered and worked them back into the interview so that each informant addressed as many of the same questions as possible. This technique allowed for answer triangulation so that any significant answer from one respondent was validated by other informants. Following Kumar (1989), interviews were conducted with help of a previously designed interview guide taking special care to the way questions were worded in an attempt to maintain as neutral an attitude as possible.

Maintaining an easily retrievable case study database is critical to assure the validity of a case study (Yin, 1994). In this ways it is possible to re-inspect the data by the author or from other researchers. With this in mind all interviews were recorded in both audio and digital video formats. Almost all interviews were conducted in Spanish. Spanish language transcripts were produced and were analyzed using a qualitative data analysis software program called QSR NUD\*IST- N5® (QSR International, 2000).

#### Direct Observation

Structured direct observation, according to Kumar (1989), can be an extremely useful in the data triangulation process. Armed with theoretical expectations about investment and expenditure differences between the corn and soybean divisions, analysis was made of Pioneer infrastructure, technology, human resources, and advertising and marketing. Our use of the digital video equipment as well as photographs helped to document what investments were made and what equipment was being used for each business unit. To conduct the observations of physical assets

visits were made to Pioneer R&D and production facilities and multiplier farms.

## Quantitative Data

### *Firm Documents*

Yin (1994) suggests that the best use for documents is to augment the evidence from other sources. Pioneer, Argentina provided us access to their financial records. Records are maintained separately between the two business units. Therefore an analysis of the balance sheet, income statements, and pricing data were made available to the authors. Due to the sensitivity of the material, ratios comparing the corn and soybean units will be used whenever possible. The financial data serves three purposes; first it is useful to corroborate the responses of Pioneer managers as to the state of each of the businesses; second the data can be used to analyze the propositions pertaining to the difference financial impacts weak IPR protection has on a firm; third the data helps to quantify the welfare impacts.

### Methodological Validity

As numerous authors (Yin, 1994; Gummesson, 2000; Westgren and Zering, 1998) have noted, there is no hierarchy of research methodology. Of the many tools available to researchers each has an appropriate place. There is no perfect research methodology that serves all criteria for proper empirical analysis.

Researchers offer several tests of validity with respect to the case study method. The validity test is: does the empirical evidence in fact correspond to the phenomena under study (Gummesson, 2000). Our study employs the single case approach. Therefore is the case of Pioneer Argentina and the research design valid for analyzing the phenomena of firm and host country welfare impact from weak IPR protection? In order to make the validity argument there

are numerous design options many of which this research incorporated and some of which it did not.

First, theoretical grounding adds formality and discipline to the research process. Because of our extensive use of the theoretical literature, supported by the more limited empirical evidence, we would argue that Pioneer is a valid context by which to study the phenomena. Contributing to the methodological validity is our research design and implementation such that our research could be replicated within the same context or transferred to a new context.

The second important aspect of empirical validity with respect to the single case study approach is its context. Does the study of Pioneer effectively incorporate the phenomena of question (see Westgren and Zering, 1998)? The explicit discussion above, detailing the uniqueness of the Pioneer case to study the IPR question, constitutes our argument that this case provides an excellent context by which to analyze the phenomena.

Third is the depth of the research, what Yin calls embeddedness. Cross-sectional data (i.e. USITC, 1988 Mansfield, 1994 and Braga and Willmore, 1991) provides a form of breadth of analysis. The single case study approach, on the other hand, allows depth of analysis. In our case, embeddedness was captured through in-depth interviews, multiple interviews within the firm, quantitative analysis of firm-level and industry level data.

Fourth is the issue of triangulation, which asks multiple parties the same questions to see if their responses corroborate each other. While not all answers need not be “identical,” they should be consistent. If they are not consistent, then a reason needs to be found. Triangulation was achieved by: conducting multiple interviews within the same firm; interviewing competitors, supply chain members, and third parties (i.e. government); analyzing quantitative data (firm and

industry, and national); and conducting and documenting direct observations. In this way a consistent and reliable picture of the phenomena is created.

A fifth contributor to empirical validity is the use of multiple cases to analyze the same phenomena. Additional cases demonstrate reliability and in that way contribute to the robustness of the conclusions. In this way our methodology is lacking. With multiple cases there is always the question of cost and time. More significant in our situation would be replicating the level of intimacy with the company under study. We were very lucky to have had such a high level of access. This depth of access compensates for the lack of additional cases.

Finally, case study researchers recognize that longitudinal analysis adds power to the results by limiting the possibility of serendipity. Helpman (1993) notes the importance of dynamics when assessing the welfare impacts from weak IPR. This too is a valid critique of our methodology where more time spent is studying a phenomena is usually better. Because our analysis is static we are going to have to impute the dynamic implications of the firm's behavior.



## Results and Analysis

Before exploring the behavior of Pioneer there are two important contextual issues to establish: the degree of demand homogeneity between the US and Argentina, and the level of IPR protection in Argentina.

### Demand Homogeneity

Demand homogeneity implies that a particular country does not have specific needs or preferences regarding a particular product. If in fact exists, such country would find free riding easy and as an advantageous way to obtain technology; if the inverse is true, free riding would be unlikely, since products would be unsuitable for their needs.

In the case of agricultural seeds, even among very close regions there has to be some site specific adaption. This is due to the differing climatic and agronomic conditions even within close proximities. This degree of adaptaion would map over to the notion of degree of homogeneity. A region that reuired very little adaption, say from county to county ina US setting would be condshireerd very homogeneous, while a region that reuired a lenthly R&D process to produced adapted varieties or hybrids would be considered heterogeneous. Argentina's corn and soybean production is concentrated in the Pampas, an extensive plains with abundant land suitable for agricultural and cattle production. The region has a climate similar to the U.S southeast with humid summers, mild winters and rainfall ranging from 20-39 inches (Encyclopedia Britannica, 2001)

Seeds are classified according to the days that they require to achieve maturity and this varies

depending on the geographic location. In general, cropland that is further away from the equator requires shorter maturities, due to the shorter growing season.

Pioneer corn seed offerings in Argentina, range from 100-128 days to maturity (Pioneer, 2000). The typical offering in the Southern US is 103-132 (Pioneer, 2001). In the case of soybeans the date range is a little different but the concept is the same. In Argentina Pioneer only offers soybean seed from two groups, III and IV, which have a range of maturity<sup>1</sup> (RM) of 30-39 and 40-49, respectively (Pioneer, 2000). According to the marketing manager group V is also demanded but it is not offered. Compared to the southern US the typical soybean maturity groups planted are from groups II-VIII (Pioneer, 2001). While the Argentinina environment is not completely homogeneous to that of the US, as the above description points out there is, in the business of agricultural seed a high degree of homogeneity.

### IPR Protection in Argentina

In Argentina, patent rights have existed since 1864 with the Act on Invention Patents but they have been applied to every industry but because of the Acts age was not applicable to newer industries such as software and pharmaceutical (Muir, 1993). However when patents were infringed criminal litigation seldom took place because of the complexity of the legal system. In spite of its limitations, the legal system has been efficient in discouraging patent infringers because copyright and patent holders used seizures as preventive tools to effectively put pirates out of business (Chaloupka, 1994).

The Act on Invention Patents, since its creation and until 1994 had not been amended; only slightly adjusted in order to adhere to the Paris Convention (1966) and the Stockholm Act (De las Carreras, 1994). By 1994, the Agreement on Trade-Related Aspects of Intellectual property Rights

(TRIPS) of the WTO set new standards for protection and enforcement of intellectual property. To implement the new regulations developing countries, such as Argentina, were given until January 1, 2000 and the least-developed countries until 2006. Industrialized countries were required to meet the agreement immediately (U. S. Department of State, 2000). This situation motivated substantial modifications in 1996 in Argentina. The government created the National Board of Industrial Property, extended the duration of patents to 20 years, allowed the possibility to patent microorganisms and industrial models, and codified the use of contractual and compulsory licenses (Moreno, 1996).

Despite these changes, in 1997 the Pharmaceutical Research and Manufacturers of America (PhRMA) expressed that the protection bill approved by the congress one year before, completely failed to deter piracy and it even promoted it (Chemical Market Reporter, 1997). PhRMA asked the Clinton administration to begin retaliation against Argentina. The patent law still allowed local industries to use test data from U.S. companies in order to develop its own products (Hess, 1997). The U.S administration decided to take action against Argentina in 1997, targeting some trade benefits under the Generalized System of Preferences (GSP) that allowed Argentina to have several products exempted from duties. It was not possible to take the case to the WTO because Argentina was considered a developing country at that time. Argentinean pharmaceutical officers claimed that they were not violating any agreement under the TRIPS. The U.S. was attempting to advance the implementation of the treaty ahead of the 10-year (2005) date that they are entitled to because of their developing status (Hess, 1997).

In December 1999, the United States Trade Representative (USTR) began a review of the TRIPS implementation in several countries. As a result, Argentina was found non-satisfactory and on May 1, 2000 a dispute settlement through the WTO started.

Argentina has failed to grant exclusive marketing rights for pharmaceuticals, despite being obliged to do so under the TRIPS agreement.... Argentina fails to protect confidential test data submitted to government regulatory offices.... (O)ther deficiencies are the failure to provide prompt and effective provisional measures to address patent infringement and the exclusion of micro-organisms from patent ability. (USTR, 2001)

The U.S government continued to urge Argentina for implementation of the treaty. They do recognize that the copyright law has been significantly improved in the last two years, even though enforcement is still weak (U. S. Department of State, 2000). The dispute over intellectual property rights with Argentina is critical for the U.S. Losses incurred by U.S. pharmaceutical industry due to the inefficient protection are estimated at around half a billion dollars (Hess, 1997).

In terms of agricultural biotechnology, agricultural IPR protection in Argentina is better than what it is generally assumed (Corporate Attorney, Association de Semilleros Argentinos (ASA)). This is because it is protected in part by the 1973 laws on trade secrecy protection and a strict seed law. Unfortunately, he remarks, until 1990 this law was not properly enforced until the Insituto Nacional de Semillas (INASE) was formed (Corporate Attorney, ASA/ARPOV's). In 1995 Argentina adhered to the TRIPS agreement and some patents were granted to biotech events like bacillus thurigiensis (bt). However these patents were disputed at the Argentinean antitrust agency (xxx) and the farmer/producers, serving as the plaintiffs, won. If the patent had been upheld it would have grave implications for Argentina's "brown-bag" seed sector.

But for Argentina's producers the debate about intellectual property rights does not appear to be that significant. "Looking for solutions against the crop's lack of profitability is a

priority and nobody really thinks about the intellectual property rights issues.” (Victor Trucco *La Nacion* , President of the Argentine Producers No-Till Association (AAPRESID)). He went on to clarify that in Argentina, not everybody uses black market seed, and that most of the farmers are conscious that in the long term they are better off by following the “innovator” rules, because in that way they will have the guarantee to have access to new products (*La Nacion*, 2000).

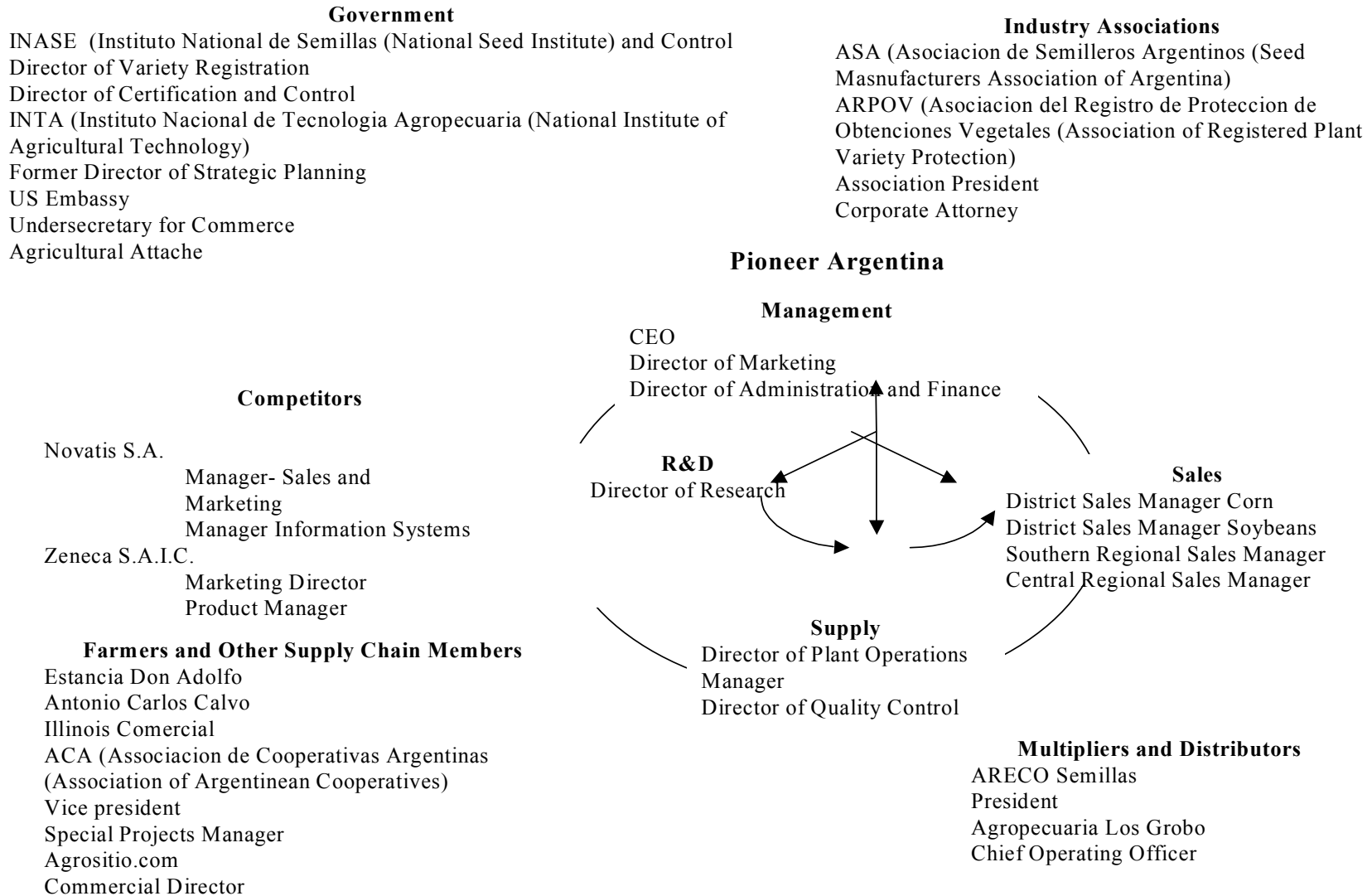
Table 1: Pioneer Product Mix

<b>Crop</b>	<b>Category</b>	<b>Number of Products</b>
Corn	Elite Hybrids	10
	Tropical Hybrids	4
	Imidazolinone Resistant Hybrids	2
	Insect Resistant (Bt) Hybrids	5
	Stacked Hybrids*	1
<b>Total</b>		<b>22</b>
<b>Other Crops</b>		
Soybeans	Roundup Ready Varieties®	7
Sunflower	Hybrids	4
Sorghum	Hybrids	4
Alfalfa	Varieties	5
<b>Total Other Crops</b>		<b>20</b>

Source: Pioneer Argentina 2000 Catalog

\* Hybrids that combine insect and herbicide (imidazolinone) resistance

**Figure 1: Overview of Key Informant Interviews**



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## Endnotes

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<sup>1</sup> RM level refers to the time it takes the plant to flower or reach maturity.