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Cargill Hybrid Seeds Mexico: A Case Study[☆]

Carlos Trejo-Pech,^a [ⓐ] Lisa House,^b and Carmen López-Reyna^c

^a *School of Finance and Management, Universidad Panamericana at Guadalajara, Sala de Profesores, Prolongación Calz. Circunvalación Pte. 49 Ciudad Granja, Zapopan, Jalisco 45010 México*

^b *Food & Resource Economics, University of Florida, 1177 McC Hall A, P.O. Box 110240 IFAS Gainesville, FL 32611-0240, U.S.A.*

^c *Agribusiness Management, Colegio de Postgraduados en Ciencias Agrícolas, Km. 36.5 Carretera Mexico-Texcoco, Montecillo, Texcoco 56230, México*

Abstract

This case study focuses on the history of Cargill Hybrid Seeds Mexico, its position in the industry and the manner in which it had grown throughout time. Details on product, facility and personnel decisions give a feel for how the company was managed and how it succeeded in growing rapidly in the 1990s. The purpose of this case study is to provide an in-depth look into the Mexican Seed industry, with a particular focus on Cargill Seeds Mexico prior to its takeover by Monsanto. Additionally, the case study allows for the discussion of how to successfully merge similar companies, in this case, three companies that are accustomed to being competitors in the market. A discussion focusing on unique human resource difficulties that come from such a merger is setup.

^{*} This case was prepared solely to provide material for class discussion. The authors do not intend either to illustrate effective or ineffective handling of a managerial situation. Some names have been disguised and some situations have been created by the authors. Due to the fact that Cargill is a privately held company some of its financial figures not published by the company have been disguised. The authors appreciate valuable comments to improve this case to Mr. Juan Pedro Silveyra, former General Manager of Pioneer Seeds Mexico, to Mr. Luis F. Cisneros, former employee of Cargill Seeds Mexico, and an anonymous former manager of Dekalb Seeds Mexico.

ⓐ Corresponding author: Tel: + 52-33-367-9 0708
Fax: + 52-33-367-9 0790
Email: ctrejo@up.mx

Other contact information: Dr. Lisa House lhouse@mail.ifas.ufl.edu Tel: 1-352-392-1826 Fax: 1-352-846-0988; Dr. M. Carmen Lopez Reyna creyna@colpos.mx Tel: + 52-595-952-0 200 Fax: + 52-595-952-0 200.

Early in the second quarter of 1999, Monsanto Mexico's top executive group was preparing to begin formal integration of seed companies acquired during the previous years. From 1996 to 1998, Monsanto Mexico acquired Asgrow Seeds, Dekalb Hybrid Seeds, and Cargill Hybrid Seeds.

F. Magaña, General Manager of Cargill Hybrid Seeds Mexico, reflected on the company he had successfully managed for a decade. Mr. Magaña had been appointed to the position of General Manager of Cargill Hybrid Seeds Mexico in 1988 after serving as the corporate controller for Cargill Mexico for a couple of years. Mr. Magaña brought a wealth of experiences when he joined Cargill – including an undergraduate degree in accounting, a Master Degree in Management, long experience with PriceWaterHouseCoopers Mexico, and employment with Ciba-Geigy Seeds or *Funks* Seeds Mexico. He knew the integration of Asgrow, Dekalb, and Cargill into one company would be difficult, but his in-depth knowledge of the industry and region would provide to be valuable.

After a few months of working within the Monsanto organization, Mr. Magaña was asked by the Monsanto Synergy Committee (MSC) to prepare a comprehensive presentation regarding the company he had represented for many years. His presentation, to be discussed with the MSC, would help define the integration strategy of the three leading seed companies in Mexico. Specifically, Mr. Magaña had been asked to include in his presentation a) an assessment of the main business strategies followed under his management period in Cargill Seeds, b) potential synergies to pursue in the integration (i.e. how Cargill Seeds should contribute into the new Monsanto organization), c) an assessment of his key personnel, and d) brand management strategies.

Cargill, Incorporated and Cargill Hybrid Seeds

Cargill, Inc. is an international marketer, processor and distributor of agricultural, food, financial and industrial products and services with 97,000 employees in 59 countriesⁱ. Cargill is organized in five business segments and units: Agriculture Services, Origination and Processing, Foods Ingredients and Applications, Risk Management and Financial, and Industrial. In 1998, Cargill achieved net revenue of \$51.4 billion, with net earnings of \$468 million and a Return on Equity (ROE) slightly below 7%ⁱⁱ, making Cargill the 16th largest company in the USA and the largest privately owned company in the world. In most of its markets, Cargill controlled a share of at least 25%, and was the largest or second largest player.

Based in Minneapolis, USA, Cargill Hybrid Seeds had researched and produced seed varieties and hybrids since the late 1940s. Cargill's first entries into Latin

America were Argentinaⁱⁱⁱ and Brazil. Cargill Seeds Mexico did not begin until the late 1980s. By 1998 the company marketed corn, sunflower, sorghum, alfalfa, soybean and canola seed in more than 50 countries. In Latin America, the four largest corn seed markets were Brazil, Argentina, Mexico and Venezuela (Exhibit 1). Cargill was the number two producer in both Argentina and Brazil markets (Exhibit 2), the number four producer in Mexico, as well as being a promising competitor in Venezuela, where Cargill Mexican corn hybrids had been successfully introduced in the last few years.

Cargill Mexico

In Mexico, Cargill started operations in the wood market in the 1920s. Due to the Mexican revolution, the company retreated from the Mexican market and did not return until the 1940s, this time trading agricultural products. In 1972 Cargill established a corporation in Mexico City. Currently, Cargill Mexico is a company with investments totaling \$184 million dollars including operations as follows^{iv}:

Animal nutrition operations in Merida, Yucatan and Irapuato, Guanajuato where Cargill processes balanced feed for pigs and cats.

Oilseed crushing and refining plant in Tula, Hidalgo, 60 miles north of Mexico City, that processes soybean meal, oils and fats to serve the feed segment in central Mexico.

A *grain* warehouse in Poncitlan, Jalisco that has the most modern technology for managing distributing and storing white and yellow corn, wheat, soybeans, rice, oats and other grains.

Cargill Seeds Mexico History

In the mid 1980s, Cargill started researching and developing hybrid seeds in Mexico, under the guidance of Cargill Hybrid Seeds International. A research station was opened in Tlajomulco de Zúñiga, Jalisco State, 30 km from Guadalajara, the second largest city in Mexico, and the home of the leading seed companies in Mexico.

By the late 1980s Cargill Seeds Mexico started selling commercial seeds. To begin, Cargill Seeds Mexico imported grain sorghum and sold it in Tamaulipas State. Cargill Seeds Mexico's headquarter was in Matamoros, Tamaulipas. During the last quarter of 1988, Cargill Seeds Mexico inaugurated its post-harvest sorghum production plant in Matamoros and Cargill Seeds Mexico moved its headquarters to Guadalajara.

In 1990, Cargill Seeds Mexico launched its first generation of commercial tropical white corn seeds, the hybrids C381, C343, and C385, which would later become only one of the best tropical corn hybrids in some geographical zones in Mexico, Central America and South America. Ten years later, the hybrids C343 and C385 remained Cargill Seeds Mexico top products. After 1990, Cargill experienced high growth rates not only in tropical corn, but also in sorghums (Exhibit 3).

However, Cargill Seeds Mexico did not have a post-harvest production plant adapted for corn, and adapting the Matamoros plant was not economically feasible due to freight costs. Thus, the post harvest production process (drying, conditioning, and packaging) was contracted with the National Seeds Producer (PRONASE), the governmental seeds company in Mexico, in its facilities at Guadalajara.

Post Harvest Seed Production Plants

Soon after Cargill launched its first generation corn hybrids, Mr. Magaña realized that a post harvest plant for corn would be necessary to support its expected growth and to have the control needed to provide the high quality seeds the market was demanding. By 1992, the “Planta Tepetates” was built in San Isidro Mazatepec, Jalisco State, close to Cargill Seeds headquarter. At 30-40 tons processing capacity per day, the Tepetates plant was a smaller plant compared with similar facilities belonging to the main seed companies in Mexico, but was equally as efficient. The Tepetates plant was built with used parts bought from other seed companies as well as with used parts (scales, silos, driers, conveyor belts, etc.) from the Matamoros plant, which was dismantled. The resulting plant allowed Cargill Seeds Mexico to provide high quality seed at a lower cost. Gross Margins increased the following years, in part explained by the economies of scale of this plant (Exhibits 4a and 4b). As part of his report to the MSC, Mr. Magaña would need to determine a sound business proposition regarding plant facilities (Exhibit 5 identifies other post harvest plant facilities in Mexico in 1999), however, he had not yet determined what this should be.

The Seed Corn Industry in Mexico

In global seed companies, corn is considered “the king.”^v Mexico was no exception; corn was the main planted crop during the 1990s (Exhibit 6). Per capita consumption of corn in Mexico is the highest of the Latin American countries, followed by Brazil and Argentina (Exhibit 7). Furthermore, potential growth in the hybrid seed corn market in Mexico was enormous, with only 20% of the total planted area currently using either improved or hybrid seeds (Exhibit 8.) Tropical and subtropical white corn represented the most important product for seed companies in Mexico (Exhibit 9). Although highland corn represented an attractive planted area, most highlands planted in corn did not use hybrid seeds.

Cargill Seeds Mexico was a very small player in the corn seeds market early in the 1990s. However, in less than ten years Cargill was able to compete closely with deeply rooted firms in this industry, such as Semillas Dekalb (Dekalb), Híbridos Pioneer de México (Pioneer), and Asgrow Mexicana (Asgrow), companies established in Mexico since the 1970s.^{vi} By 1998, more than 85% of the corn seed market in Mexico was concentrated in those four companies, with Asgrow and Pioneer in the lead, followed by Dekalb and Cargill. In some markets, such as the Southeast and the Pacific areas, Cargill was the leader or a close follower. Cargill seeds market share was estimated around 15% in tropical and subtropical combined white corns by 1997, but it lost significant market share in the 1998 seasons. Asgrow and Pioneer maintained market share around 25-30%, followed by Dekalb with a 15-20%.

Products

A hybrid seed or “improved” seed is the product of a cross among two or more families of the same plant. The challenge was to select the combination of ancestors that would produce hybrid seeds with characteristics that better satisfied the clients. The advantage of the hybrids over traditional seeds is focused on the alteration of the genetics, such as the ability to bear extreme climates, to resist insects or diseases, drought and herbicides. Hybrid seeds that possess those characteristics could produce higher yielding. Typically, several generations of research and plant growth were needed to develop a new competitive product. Cargill had at its disposal not only the ancestor plants from Mexico, but also the genetic base of Cargill International. Generally, 7 to 10 seasons of test and research, and approximately a million dollars were needed to develop a single product.^{vii}

Cargill's main products were corn and sorghum. Those products commercially classified as tropical corn in Exhibit 10, were technically tropical and subtropical corn. In addition Cargill Seeds Mexico marketed temperate and highland corn. Tropical corn sales represented the most important product category for Cargill Seeds and other seed companies. In Cargill Seeds Mexico, for instance, tropical corn represented approximately 70- 80% of net income. Exhibit 11 shows tropical and subtropical commercial corn hybrid seeds in the Mexican market by selected companies.

Distribution and Marketing

Hybrid seeds in Mexico were sold by a distribution network, which in turn had a sub-dealers network. Sales force of the seed companies (salesmen usually held an undergraduate degree in agriculture) was responsible for dealers' development, sales budgets, technical support, collection, and other marketing related activities.

Another issue Mr. Magaña knew would be important to the new company was what to do with the sales forces and dealers networks of three seed companies.

Cargill Best and Worst Years

1993-1994 was an excellent year for Cargill Seeds Mexico. Mr. Magaña received a special recognition awarded by Cargill Hybrid Seeds in Minneapolis, USA for obtaining the highest earnings level compared with all Cargill Seeds companies in the world. This was followed, however, by a terrible year for the Mexican economy. The now famous "Mexican Peso Crisis" took place at the end of 1994 and on December 24, 1994, the Mexican peso was devaluated 13% against the US dollar. By the first week of January 1995, the peso reached \$5.795 Mexican pesos/us dollar, leading to an economic depression. Some companies, with high level of dollar denominated debt and low accounts receivables in U.S. dollars failed. Cargill Seeds Mexico was not affected due to the hedging policy followed by Mr. Magaña. Cargill Seeds Mexico hedged its positions through buying futures and options through Cargill Mexico Corporation. However, 1995 was also a bad year for the seed industry in Mexico. The Mexican economic crisis and the area reduction of the corn planted in Mexico contributed to decreased earnings experienced by Cargill Seeds Mexico in the 1994-1995 fiscal year. Mr. Magaña was able to turn around quickly, showing considerable financial improvement by 1996-1997 (Exhibits 4a and 4b). One of the strategies Mr. Magaña used to facilitate the turnaround was called the personnel career development plan.

Personnel Career Development Plan

By the end of 1996 Cargill Seeds Mexico implemented the "personnel career development plan". This plan was one of the most aggressive strategies implemented by Mr. Magaña with regards to human resources. The objective of the plan was simple: to identify key employees within the organization, to identify new positions to be created in the future for which they would compete, and to place them in training programs within the organization to train for these higher positions. Often more than one employee was identified for each future position. When the new position was created the "winner" was announced without formal application procedures.

The program centered around two unique features. First, future positions likely to be opened within Cargill Seeds would depend upon market share targets, which were clearly specified; for instance, when Cargill market share grew 3 percent points, a Commercial Direction position would be created (and other positions expected to be needed to support the growth). Secondly, those people likely to occupy those positions were notified in advance, for instance, for the Commercial Direction, the names of the sales manager, the marketing manager, and the administrative manager were publicly announced as potential commercial directors

to almost all Cargill Seeds Mexico employees in a general meeting. The same was done for many positions that were expected to be created as Cargill Seeds market share increased. Thus, a virtual future organization was created with the two or three names of the potential employees. This virtual organization was linked entirely to market share goals.

This program caused different reactions among the personnel. Employees received such an implicit message: "Cargill is (is not) interested in you as a key employee in our future organization". This resulted in some highly motivated and highly demotivated employees. Ambiguous reaction among Cargill Seeds executives was experienced the following months. Groups of power were then formed within the organization, cannibalism among executives increased, and productivity increased as well.

Cargill Personnel

As Mr. Magaña had to evaluate his top management team he wondered how this evaluation could be made in a professional and objective manner. He suspected that some positions would be especially important for the MSC for which he was preparing his presentation. A sample of Cargill Seeds Mexico first level manager positions and their achievements are described as follows.

Research and Development (R&D) Manager

The R&D department in a seeds firm was a key and very sensitive department for the company's success, and was the more expensive asset in a seed company. Mr. Ramiro was in charge of the R&D department for Cargill Seeds Mexico since 1990. With a long career as a corn breeder within the Cargill organization, he worked for Cargill Seeds Brazil before joining Cargill Seeds Mexico. Mr. Ramiro reported to both the General Manager of Cargill Seeds Mexico and to the Manager of R&D department of Cargill Hybrid Seeds International, a position occupied by a Brazilian executive who used to be Mr. Ramiro's coworker in Brazil. Mr. Ramiro also maintained a close friendship with Cargill Mexico Country Director, who also had been a co-worker in Brazil. Mr. Magaña and Mr. Ramiro only maintained a work relationship. In the beginning years in Cargill Seeds Mexico, Mr. Ramiro was reluctant to accept Mr. Magaña's authority. Mr. Magaña thought that as a proxy to objectively evaluate Mr. Ramiro's work in Cargill Seeds Mexico, he could use the sales history of Cargill Seeds Mexico broken into details by hybrid (Exhibit 10).

A common criticism of the R&D department was that it had not been able to launch better hybrids than C343 and C385, a double-way cross and triple-way cross hybrid respectively developed by a Mexican breeder who left the company as a result of authority conflicts with top management before Mr. Ramiro was hired. One of the most promising corn hybrids launched under Mr. Ramiro's administration was the

C920, a single-way cross hybrid, but, this was also the most costly to produce. However, by 1998, C920 still had achieved neither the sales levels or gross margins of C343 or C385 .

Commercial Director

A commercial director position was created in 1997 under Mr. Magaña's personnel career plan. Mrs. C. Medina, an employee who had joined Cargill Seeds Mexico in 1992 as an Administrative Manager, was placed in charge of this position. Reporting to Mr. Magaña, it was the only position in the company with the category of "direction", other first level management positions titled "managers". Mrs. Medina held an undergraduate degree in accounting and had done an excellent job as a controller during her five years in this position. The Sales Manager, Marketing Manager, Account Receivables and Collection Managers all reported to Mrs. Medina. Mrs. Medina arrival to this position had created some stress among managers in the operating departments as it was uncommon for a woman to manage an operating male-oriented department in a male-oriented industry (agriculture in general). To further complicate matters, Mrs. Medina did not have a technical background in agriculture and salespeople used to comment that she was always thinking in numbers without even knowing the products and the farmers.

Sales Manager

A sales manager was in charge of the sales force of around 20 people divided by geographical areas. A. Simental, a long time employee of Cargill Seeds Mexico was in charge of this department. After working as a salesman for Northrup King Mexico in Sinaloa, he joined Cargill in the late 1980s. He had been a salesman in the Sinaloa area, a Marketing Manager and a Sales Manager for Cargill Seeds Mexico. Mr. Simental also held an undergraduate degree in Agriculture from one of the most prestigious agricultural schools in Mexico.

Mr. Simental and Mrs. Medina never understood each other. When the commercial direction position was announced in 1997, Mr. Simental and his team were disappointed, as they were expecting Mr. Simental to become the commercial director. Over time, their relationship did not seem to improve, and it was very difficult for Mrs. Medina and Mr. Simental to work together.

Marketing Manager

G. Hernández was the marketing manager for a department that was not very active. Less than five people worked in the marketing department. Although the marketing related activities in the industry were very important, especially those related with commercial trials, the sales department and distributors were more

involved on these activities. Mr. Hernández was a former Dow Agrochemicals employee who joined Cargill Seeds in 1996.

Field and Plant Production Manager

M. Vera held the position of field and plant production manager. One of the oldest Cargill Seeds employees, with experience in research and development, production and plants, Mr. Vera had received this position through the personnel career development plan in 1997. He held a Master of Science degree in Agriculture and had been successful at both field production and post harvest processing given his years at Cargill.

Others

Other management positions included Logistics, Management Information System and Budgets, Administration, and Human Resources.

Monsanto

Monsanto was a mainstream chemical company until the 1990s when it reinvented itself as a Life Sciences company, investing heavily in biotechnology. By 1999, Monsanto products included Roundup™ herbicide, an artificial sweetener named Nutrasweet, and the Roundup Ready™ family genetically modified crops.

By the mid 1990s Monsanto realized that in order to capture the value from its biotech products it had to have a way to deliver the product to the farmer and capture the value that had been added. The delivery mechanism was the seeds, as the genetically modified seed contained the traits that were of additional value to the customers^{viii}. By the second half of the 1990s Monsanto began acquiring seed companies and establishing alliances in this industry. By 1999, Monsanto had spent \$8 billion in acquisitions and joint ventures, with \$3.5 billion in acquisitions just since 1996^x. Monsanto was very active in the merger and acquisition trend in the agriculture industry (Exhibit 12).

In Mexico, Monsanto had a long tradition of marketing agrichemical products. Monsanto's "Faena" (Roundup™) herbicide was the most sold product in its category. Monsanto executives had successfully co-managed Asgrow seeds Mexico, a company with impressive grow rates in recent years with the highest market share in the country by 1999.

Monsanto Acquires Cargill Seeds

The international business press published in June 29, 1998^x the following note generated in St. Louis Missouri, Monsanto headquarters:

Monsanto Company and Cargill, Incorporated, announced today that they have signed a definitive agreement for Monsanto to purchase Cargill's international seed operations in Central and Latin America, Europe, Asia and Africa for \$1.4 billion.

The acquisition includes seed research, production and testing facilities in 24 countries and sales and distribution operations in 51 countries in the five regions.... (it) does not include Cargill's seed operations in the United States and Canada or Cargill Agricultural Merchants in the United Kingdom.

"The potential for our existing biotechnology traits outside North America is roughly double the acreage potential within North America. The Cargill international seed businesses give us quicker access to these global markets. We can accelerate commercialization through established distribution channels that will bring these and our future agronomic and quality traits to more farmers around the world in the varieties they want to grow," said Monsanto President Hendrik A. Verfaillie.

"The biotechnology revolution is rapidly changing the international seed industry, and Monsanto has been a key player in this arena," said Ernest S. Micek, Cargill chairman and CEO. "This agreement combines Cargill's excellent germplasm and international research, marketing and distribution network with Monsanto's leadership in biotechnology."

Monsanto and Cargill expect that Cargill businesses in Central and Latin America, Europe, Asia and Africa will continue to market Cargill seeds. Cargill is a leading global producer of tropical corn seed and germplasm with significant sales in the Central and Latin American, Asian and African markets. ... Its international seed businesses employ approximately 2,200 people.

A few months prior to the acquisition announcement, Mr. Magaña and his closest managers had worked gathering historical data and preparing forecasts regarding Cargill Seeds Mexico. This information was requested by Cargill Hybrid Seeds International to prepare the prospect, to value the business unit, and to promote the sale of the international seeds division. Although a time consuming task, this job was led by Mr. Magaña and prepared exclusively by Cargill employees, no external consulting companies were hired for the project. First and mid-level managers were directly involved in the project, and the "seed business" did not receive the attention it needed during those months. An example of the toll the timely preparation took on the seed business was that the first time in its history, Cargill Seeds Mexico failed to submit on time in full its budgets and business reports to the Cargill International Long Range Planning Committee (LRPC) in April 1998.

The widespread knowledge that the information was being prepared to aid Cargill Hybrid Seeds International in selling Cargill Seeds Mexico left most employees with a feeling of confusion and demotivation the months before the acquisition. As noted in Exhibit 3, Cargill's sales volume - and consequently, its net earnings -, decreased significantly during this time period, adding to the disappointment of Mr. Magaña and his management team, who were accustomed to better numbers for their division. Additionally, the "new owners" of Cargill Seeds Mexico would be Asgrow executives (Asgrow had been acquired by Monsanto in September 1996 (Exhibit 12)). In Mexico, Monsanto Seeds meant Asgrow, and Asgrow had the largest market share in the corn seeds market, lightly surpassing Pioneer in the last two years. Due to the years of competing with Asgrow, the managers of Cargill expected the leaders of Asgrow to look down on the management team of Cargill. Furthermore, Monsanto acquired Dekalb Genetics in May 1998 (a month before the Cargill acquisition); Dekalb, in turn, was one of the oldest players in the Mexican seeds market, with a market share superior to Cargill's. Thus, Cargill top management were speculating that in the integration process of Asgrow, Dekalb, and Cargill, their company would be seen as weakest one, and that they would not be able to contribute as much to the development of strategy, not to mention maintaining their jobs. Finally, as had been suggested in the business press, Monsanto corporate culture was different than Cargill's potentially making the integration process even more difficult.

Brands Management

Suddenly Monsanto Mexico owned three well-positioned seed brands under a common germoplasm base. The next question would be how to manage these brands efficiently. As part of the agreement, Cargill Incorporated had granted use of the Cargill name for two years following the acquisition.

Cargill C343, C385, and C920 were well known brands in many regions in the country. Typically, in the Mexican seeds corn market, private companies used to call its hybrids using the first letter of its name followed by a number, such as C343 from Cargill, P3066 from Pioneer, D865 from Dekalb or A7520 from Asgrow. Asgrow was one of the first companies to change this tradition with the introduction of animal names such as Pantera, Jaguar and Lince. Dekalb with its well know logo (a corncob flying) was a highly positioned brand in the middle of the country.

Additionally, C343 and C385 were well-accepted hybrids in Central America and Venezuela. Marketed with another name, C343 was the leading corn product in Venezuela. Cargill Seeds Mexico was producing high levels of C343 finished products and supplying the growing Venezuelan market. Mr. Magaña was once criticized for pushing these hybrids into foreign markets because the gross margins were very low compared to those in Mexico. However, Mr. Magaña was convinced that those markets would grow to such levels that the entire Cargill organization

would grow as well. He was “making the market for Cargill there”. By 1998, Cargill Venezuela was the leading company marketing Mexican tropical corns. Cargill Venezuela was trying to produce these hybrids there but it was still buying high volumes from Cargill Mexico.

Monsanto wanted to hear Mr. Magaña’s proposition on how to manage the brands. Mr. Magaña knew there were a number of different options. Monsanto could create a new brand (i.e. Monsanto Seeds) to compete against Pioneer; they could create three brands for three different market segments (such as elite, medium and low profile markets); or they could create a new brand only for the Cargill hybrids (they kill C343, C385, and so on). Other possibilities existed also. Once these decisions were made, he would have to think about how to communicate the branding strategy to the market, both to dealers and final customers, and the timing of such communications.

Synergies and the Future

1998 had been a difficult year for Cargill Seeds Mexico. Market share, revenues and net earnings had decreased, and Cargill had been acquired by Monsanto (Asgrow) seeds. F. Magaña knew that the position of Cargill Seeds was the weaker compared with Asgrow and Dekalb. Although he was proud to grow Cargill Seeds Mexico from nothing to be a top seed business in Mexico, he was afraid that his job and that of his team were not fully appreciated. He wanted to communicate that in a professional way, highlighting not only the successes of Cargill Seeds under his administration but also his failures. He was also worried due to the fact that his executives’ careers were in danger when presenting his results. The MSC was really interested in Mr. Magaña’s views, despite the fact that they had already gathered and analyzed some data. Mr. Magaña knew that even his future within the Monsanto organization could depend on his ability to demonstrate his knowledge of the industry.

The MSC already had many ideas on how to integrate the three leading seed companies into one and capture some synergies. However, the committee knew Mr. Magaña’s opinion would be very valuable. As Mr. Magaña started to prepare his presentation he realized the seeds industry in Mexico would be very different in the new millennium.

Exhibit 1 Composition of maize seed sales, Latin America, 1996 (000 t)

	Public seed agencies			Private seed companies *		
	Varieties	Hybrids	Total	Varieties	Hybrids	Total
Central America	33	23	56	962	4,382	5,344
Costa Rica	3	0	3	0	110	110
El Salvador	15	2	17	10	2,010	2,020
Guatemala	15	21	36	145	1,363	1,508
Honduras	0	0	0	389	574	963
Nicaragua	0	0	0	377	95	472
Panamá	0	0	0	41	230	271
Caribbean	1,057	194	2,051	311	0	311
Cuba	612	194	1,606	0	0	0
Dominican Republic	445	0	445	50	0	50
Haiti	0	0	0	261	0	261
Mexico	1,728	2,314	4,042	427	28,125	28,552
C America, Caribbean and México	2,818	2,531	6,149	1,700	32,507	34,207
Andean Zone	391	402	793	3,202	16,577	19,779
Bolivia	21	0	21	1,081	1,088	2,169
Colombia	50	0	50	716	2,469	3,185
Ecuador	181	367	548	276	1,988	2,264
Perú	139	35	174	528	762	1,290
Venezuela	0	0	0	601	10,270	10,871
Southern Cone	126	0	126	8,655	223,723	232,378
Argentina	0	0	0	1,236	76,762	77,998
Brazil	0	0	0	7,391	144,370	151,761
Chile						
Paraguay	126	0	126	28	2,591	2,619
Uruguay						
South America	517	402	919	11,857	240,300	252,157
Latin America	3,335	2,933	7,068	13,557	272,807	286,364

* Including non-governmental organizations (NGOs)

Source: Morris , M.L., and M.A. López Pereira. 1999. Impacts of Maize Breeding Research in Latin America, 1996-97. Mexico, D.F.: CIMMYT

Exhibit 2. Leading maize seed producers, Latin America, 1996

	# 1 seed producer	# 2 seed producer	# 3 seed producer	Combined market share(%)
Central America				
Costa Rica	Piscis	Desarrollos del Futuro Nima	Agrocosta	90
El Salvador	Semillas	Prosela	Lombardia	85
Guatemala	Cristiani	Seminal	ICTA	78
Honduras	Cadelga	Hondugenet	Segovia	68
Nicaragua	SAGSA	Agrosemillas	Gurdian	70
Panamá	Melo	Semillas Superiores	Margarita	95
Caribbean				
Cuba	Ministry of Agriculture			100
Dominican Republic	Ministry of Agriculture	Prod. de Semillas Dominicana	National University	97
Haiti	ORE	Agrotechnique		100
Mexico	Pioneer	Asgrow	Dekalb	68
Andean Zone				
Bolivia	Agrocerec	Cargill	Pioneer	68
Colombia	Valle	Pioneer	Cargill	68
Ecuador	Agripac	Senaca	Emsemillas	84
Perú	Cargill	Semillas Peruanas	Maize Program	70
Venezuela	Seminaca	Sehiveca	Sefloarca	62
Southern Cone				
Argentina	Dekalb	Cargill	Pioneer	62
Brazil	Agrocerec	Cargill	Pioneer	70
Chile				
Paraguay	Cargill	Agrocerec	Pioneer	76
Uruguay				

Source: Adapted from Morris , M.L., and M.A. López Pereira. 1999. Impacts of Maize Breeding Research in Latin America, 1996-97. Mexico, D.F.: CIMMYT

Exhibit 3. Cargill Seeds Mexico Historical Sold Volume by Products

Year (june to may)	1990	1991	1992	1993	1994	1995	1996	1997	1998
Corn	189	894	1,993	3,611	5,631	3,900	4,045	6,974	6,169
Sorghum	1,424	1,699	794	447	1,075	1,251	2,415	2,191	1,511
Total	1,613	2,593	2,787	4,058	6,706	5,151	6,460	9,165	7,680

Note: Cargill Fiscal year ends on May. For instance, 1993 values correspond to May 1992 - June 1993.

Estimates prepared by the authors.

Cargill Seeds Mexico Historical Sold Volume by Products (Ton)

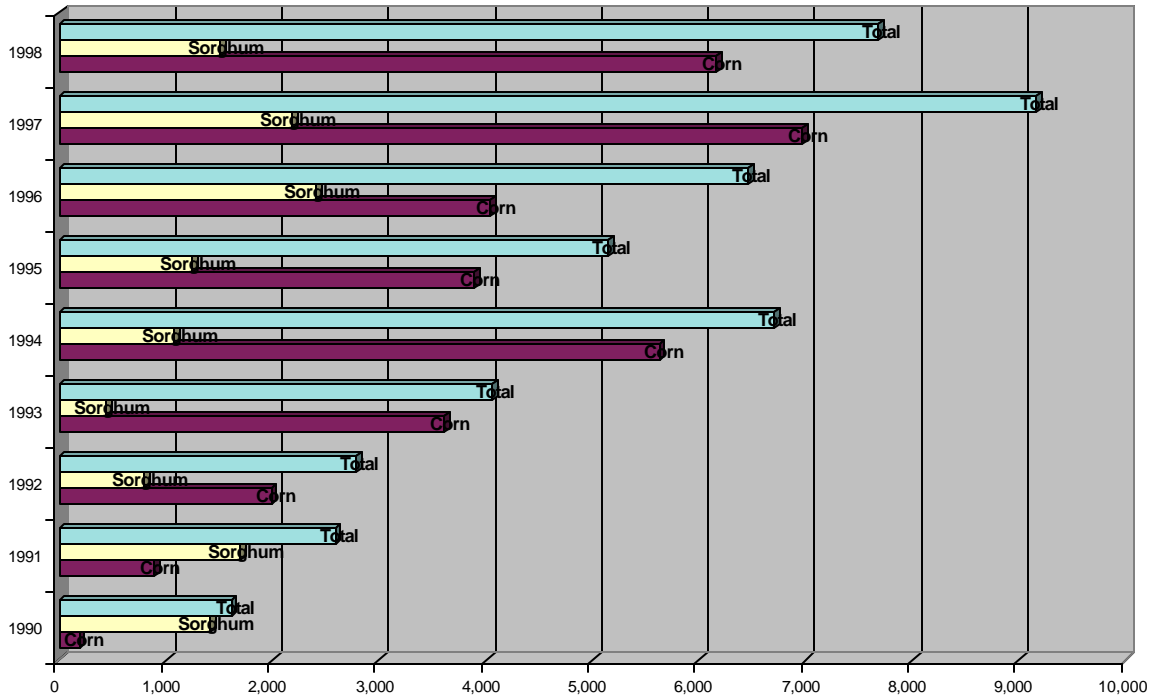


Exhibit 4a. Cargill Seeds Mexico Common Size Net Income Statement Summary

	1992		1993		1994		1995	1996		1997		1998	
	budget	Actual	budget	Actual	budget	Actual		budget	Actual	budget	Actual	budget	Actual
Revenues	100%	100%	100%	100%	100%	100%	NA	NA	100%	100%	100%	NA	100%
COGS	49%	50%	50%	46%	35%	40%	NA	NA	46%	50%	52%	NA	49%
Gross Margin	51%	50%	50%	54%	65%	60%	NA	NA	54%	50%	48%	NA	51%
Net Income	6%	11%	9%	19%	28%	25%	NA	NA	11%	14%	22%	NA	7%

Note: Cargill Fiscal year ends on May. For instance, 1993 values correspond to May 1992 - June 1993.

Estimates prepared by the authors.

Exhibit 4b. Cargill Seeds Mexico Common Size Net Income by crops, 1997

	Revised Budget	1st Qtr		2nd Qtr		3rd Qtr		4th Qtr		Final P/L		Final P/L By Corp		
		Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	%	Diff	Corn %	Sorgh %	
Net Sales	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	22%	80%	20%
Cost of Sales	41%	40%	38%	33%	34%	38%	40%	47%	53%	43%	28%	74%	26%	
Waste/Unsaleable Seed	7%	3%	2%	3%	4%	7%	5%	9%	9%	6%	4%	81%	19%	
Warehousing Expenses	3%	4%	4%	3%	4%	4%	4%	2%	2%	3%	41%	83%	17%	
Gross Margin	50%	53%	56%	61%	58%	51%	52%	42%	36%	48%	18%	86%	14%	
Sales and Marketing	9%	11%	8%	16%	7%	9%	7%	6%	5%	7%	-13%	80%	20%	
Research	4%	6%	6%	8%	5%	4%	4%	2%	4%	5%	26%	90%	10%	
Administrative Local	8%	10%	11%	15%	7%	9%	13%	4%	5%	8%	19%	80%	20%	
Country Allocation	2%	3%	2%	3%	2%	2%	2%	1%	1%	2%	1%	80%	20%	
Total General Expenses	24%	29%	27%	42%	21%	23%	26%	14%	14%	21%	6%	82%	18%	
Interest Income/(exp)	-4%	-7%	-7%	-6%	-4%	-4%	-4%	-3%	0%	-3%	-19%	80%	20%	
Other Income/(exp)	1%	1%	2%	1%	1%	0%	1%	1%	2%	1%	156%	80%	20%	
Profit Before Tax	22%	18%	23%	14%	35%	24%	23%	26%	23%	26%	43%	94%	6%	
Income Tax	2%	3%	2%	3%	2%	2%	2%	1%	-5%	-1%	-135%	80%	20%	
Net Profit Af Tax & Bf Trans	20%	15%	21%	11%	34%	22%	21%	24%	28%	26%	61%	89%	11%	
Translation gain/(loss)	-6%	-9%	-6%	-3%	-4%	-7%	-9%	-5%	-1%	-5%	-8%	80%	20%	
Net Profit Af Tax & Trans	14%	6%	14%	8%	29%	15%	12%	19%	27%	22%	91%	91%	9%	

Metric-Tons	Revised Budget	1st Qtr		2nd Qtr		3rd Qtr		4th Qtr		%	Total Dif
		Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual		
Maize	5,750	1,100	1,155	868	1,598	1,283	1,260	2,499	3,001	76%	22%
Sorghum	1,937	631	587	22	28	730	760	554	798	24%	12%
Total	7,687	1,731	1,742	890	1,626	2,013	2,020	3,053	3,798	100%	20%

Gross Profit by Crop (in %)	Revised Budget	1st Qtr		2nd Qtr		3rd Qtr		4th Qtr		%	Final P/L Diff
		Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual		
Maize	86%	76%	81%	102%	106%	77%	72%	90%	82%	86%	0%
Sorghum	14%	24%	19%	-2%	-6%	23%	28%	10%	18%	14%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	0%

Note: Cargill Fiscal year ends on May. For instance, 1993 values correspond to May 1992 - June 1993. Estimates prepared by the authors.

Exhibit 5. Post harvest seed production plants in Mexico, main seed companies.

Cargill Seeds	Tepetates plant for corn and sorghum. Jalisco State. Estimated capacity 30-40 tons per day.
Dekalb Seeds	1- Nestipac Plant for corn and sorghum. Jalisco State. One of the most efficient in the industry Estimated capacity twice or three times Cargill's. 2- Sorghum plant Sinaloa, State
Asgrow Seeds	1- Los Mochis for corn and sorghum Sinaloa, State Capacity similar to Dekalb plant 2- Bajío Plant Guanajuato State The most modern in the industry Similar capacity
Pioneer	1- Culiacán Plant Sinaloa State 2- Reynosa Plant Tamaulipas State

Source: Prepared by the authors.

Exhibit 6. Selected main crops planted in Mexico (ha)

	1,990	1,991	1,992	1,993	1,994	1,995	1,996	1,997	1,998
Corn	7,917,518	7,730,038	8,002,675	8,247,607	9,196,478	9,079,636	8,638,735	9,133,074	8,514,912
Wheat	958,929	1,006,910	954,260	899,314	1,018,790	968,575	853,096	721,243	789,271
Bean	2,271,620	2,198,857	1,860,880	2,151,020	2,385,562	2,353,750	2,195,840	2,319,561	2,376,929
Soybean	296,748	348,255	326,895	241,390	299,230	150,801	55,505	165,183	100,407
Sorghum (grain)	1,915,717	1,509,351	1,457,811	974,280	1,434,665	1,584,394	2,344,767	2,123,185	2,198,945

Source: Prepared by the authors with original data from the Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación, The Mexican Department of Agriculture.

Exhibit 7. Maize consumption, Latin America, 1992-94

	Consumption (million ton)	Consumption Per capita (kg)
Central America	3.57	117.1
Caribbean	1.09	43
Mexico	18.46	209.8
Central America, Caribbean, and Mexico	23.11	178.8
Andean Zone	5.95	61.8
Southern Cone	39.79	189.4
Argentina	5.61	165.7
Brazil	32.28	208.6
Chile	1.28	93
Paraguay	0.43	92.8
Uruguay	0.2	61.8
South America	45.74	149.3
Latin America	68.86	158.1

Source: Adapted from Morris , M.L., and M.A. López Pereira. 1999. Impacts of Maize Breeding Research in Latin America, 1996-97. Mexico, D.F.: CIMMYT. Pp 6.

Exhibit 8. Area planted to local varieties, improved open polinized varieties, and hybrids, Latin America, 1996 (% of total maize area).

	Area Planted to local varieties	Area planted to Improved germplam		
		Improved OPVs	Hybrids	Total Mvs
Central America	78.3	3.3	18.5	21.8
Costa Rica	58	1.1	40.9	42
El Salvador	51.8	0.5	47.6	48.1
Guatemala	82.8	1.7	15.4	17.1
Honduras	84.3	7.2	8.6	15.8
Nicaragua	93.1	5.6	1.3	6.9
Panamá	57.1	0.6	42.3	42.9
Caribbean	68.7	18.5	12.8	31.3
Cuba	5.5	36	58.5	94.5
Dominican Republic	24	76	0	76
Haiti	92.7	7.3		7.3
Mexico	79.7	1.1	19.2	20.3
Central America, Caribbean and México	79	2.2	18.8	21
Andean Zone	55.6	8.2	36.3	44.5
Bolivia	47.9	27.1	25.1	52.2
Colombia	73.7	6.6	19.8	26.4
Ecuador	73.2	5	21.8	26.8
Perú	75.3	11.7	13	24.7
Venezuela	1	0	99	99
Southern Cone	37.1	6.1	56.8	62.9
Argentina	12.7	2.4	84.9	87.3
Brazil	43.4	7.3	49.3	56.6
Chile				
Paraguay	64.5	1.7	33.9	35.6
Uruguay				
South America	39.2	6.3	54.5	60.8
Latin America	52.1	5	42.9	47.9

Source: Morris , M.L., and M.A. López Pereira. 1999. Impacts of Maize Breeding Research in Latin America, 1996-97. Mexico, D.F.: CIMMYT. Pp 34

Exhibit 9. Estimated distribution of maize production by ecological zone, Latin America, late 1990s (000 ha)

	Lowland tropical	Subtropical/mid-altitude	Highland	Temperate	Total
Central America	1,555	50	37	0	1,642
Caribbean	366	0	0	0	366
Mexico	3,000	1,554	3,043	0	7,597
Central America and Mexico	4,921	1,603	3,079	0	9,604
Andean Zone	1,363	415	539	0	2,317
Southern Cone	9,904	4,326	0	2,729	16,729
South America	11,267	4,740	539	2,729	19,275
Latin America	19,188	6,344	3,619	2,729	28,879

Source: Adapted from Morris , M.L., and M.A. López Pereira. 1999. Impacts of Maize Breeding Research in Latin America, 1996-97. Mexico, D.F.: CIMMYT. Pp 5

Exhibit 10. Cargill Seeds Mexico sales volume (ton) detailed by tropical corn hybrids

	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total Sorghum	1424	1699	794	447	1075	1251	2415	2191	1511
C-385	62	330	748	1335	2829	1661	1397	1910	1757
C-343	20	388	764	1554	2436	1837	1504	2307	2117
C-381	33	31	68	215	217	38	113	100	24
C-221			6		17	27	8	31	6
C-223									6
C-891					29	70	141	50	21
C-921					6	29	72	3	1
C-220					25	107	79	150	70
C-520					20	26	93	66	58
C-820					17	38	61	109	63
C-920					6	46	260	1246	1048
C-525								11	15
C-526								34	142
C-922							-1	58	226
C-923								12	73
C-805									46
C-701									28
Total Trop. Corn	115	749	1586	3104	5602	3879	3727	6087	5701
Total Temp. Corn	74	145	407	506	12	8	294	871	466
Total haititud Corn				1	17	13	24	16	2
Grand Total	1613	2593	2787	4058	6706	5151	6460	9165	7680

Summary by Crop

Year (june to may)	1990	1991	1992	1993	1994	1995	1996	1997	1998
Corn	189	894	1,993	3,611	5,631	3,900	4,045	6,974	6,169
Sorghum	1,424	1,699	794	447	1,075	1,251	2,415	2,191	1,511
Total	1,613	2,593	2,787	4,058	6,706	5,151	6,460	9,165	7,680

Source: Estimates prepared by the authors

Exhibit 11. Selected tropical and subtropical commercial corn hybrid seeds in the Mexican market by companies



C343
C385
C920
C526



A7573
A791
A7520
JAGUAR
PANTERA



D870
D865
D867
D869



P3066
P3086
P30G40

Source: Prepared by the authors

Exhibit 12. Selected major mergers and acquisitions in the worldwide corn seed industry announced between 1996 and 1999

1996

?? **Monsanto** invested \$340 million in **Dekalb Genetics Corp's** equity
September 25 **Monsanto** acquired **Asgrow Agronomics (Seminis / Empresas La Moderna)** for \$240 million

1997

Jan 6 **Monsanto** acquired Holden's Foundation Seeds for \$945 million. A corn germoplasm company
Jan 6 **Monsanto** acquired Corn States Hybrid for \$75 million. A corn germoplasm company

1998

May 11 **Monsanto** agreed to buy for **\$2,300** million the 60% of **Dekalb Genetics Corp.** it did not already owned. Dekalb Genetics Corp. was the USA's second largest marketer of genetically altered seed corn.

June 28 **Monsanto Company** and **Cargill, Inc.** signed a definitive agreement for Monsanto to purchase Cargill's international seed operations in Central and Latin America, Europe, Asia and Africa for **\$1,400 million**. The acquisition did not include Cargill's seed operations in the USA and Canada or Cargill Agricultural Merchants in the UK. Cargill was a leading global producer of tropical corn seed and germplasm with significant sales in the Central and Latin American, Asian and African markets.

DuPont paid **\$1,700** for the 20% stake in Pioneer

1999

March 15 **DuPont** and **Pioneer Hi-Bred International, Inc.**, announced that they have signed a definitive agreement that will result in DuPont's complete ownership of Pioneer. The total equity value of the transaction was estimated to be approximately **\$7,700 million** for the 80 percent of Pioneer did not already owned by DuPont. (The merger was completed on Oct. 1st)

Prepared by the authors.

Original sources: Companies' press releases. Ann Leamon under the supervision of Michael Watkins, 2001. *Robert Shapiro and Monsanto Case Study*. Harvard Business School Publishing. Case # 801-426, Revised by authors in January 2, 2003.

End Notes

ⁱ Cargill's web site

ⁱⁱ Cargill fiscal year ends on May. According to the financials disclosed by Cargill, from 1998 to 2002, its ROE averaged 7.3%, and its Assets Turnover did 1.86x

ⁱⁱⁱ Cargill introduced hybrid grain sorghum seed to Argentina in 1958

^{iv} Adapted from <http://www.cargill.com/prodserv/country/mexico.htm>

^v Xin X. He, and Paul Clark, under the supervision of Francis Aguilar, 1998. *Pioneer Hi-Bred International, Inc –Supply Management*. Harvard Business School Publishing. Case # 9-898-238.

^{vi} Although some seed companies officially started operations in Mexico later, they had precense in the country. For instance, Pioneer officially started operations in Mexico as Híbridos Mexicanos in 1983 and then as Híbridos Pioneer de Mexico SA de CV, but it was present in the country since the 1970s marketing hybrid seeds by authorized dealers such as “La Hacienda” and others in Tamaulipas.

^{vii} Adapted from Xin X. He, and Paul Clark, under the supervision of Francis Aguilar, 1998. *Pioneer Hi-Bred International, Inc –Supply Management*. Harvard Business School Publishing. Case # 9-898-238.

^{viii} Thomas Urban under the supervision of Ray A. Goldberg, 1995. *Monsanto Company: The Comming of Age of Biotechnology Case Study*. Harvard Business School Publishing, Case number 9-596-034.

^{ix} Ann Leamon under the supervision of Michael Watkins, 2002. *Robert Shapiro and Monsanto*. Harvad Businees School Publishing. Case # 801-426.

^x Originally published in both Cargill and Monsanto's web site