

# Strategic Report for Monsanto Company



**Kevin Yamazaki  
Anastasia Dialynas  
Jed Cullen**

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## Executive Summary

At the beginning of 2010, Monsanto Company's executive management retained Vector Strategy Group to provide strategic advice. Monsanto is the leading biotechnology-driven agricultural products company in the world. The company operates two business segments: Seeds and Genomics, and Agricultural Productivity. The company's extensive biotech patent portfolio and aggressive marketing strategies have given the firm a significant competitive advantage in its industry segments. With \$11.7 billion sales and an expanding bottom line, Monsanto's success has provided a strong long-term return for its shareholders. However, the company currently faces a series of issues, including the expiration of key patents, a sudden increase in industry competition, and a highly publicized antitrust case. Monsanto must address these issues as it shifts strategic focus to expanding the Seeds and Genomics segment; this is a necessary transition for the company to decrease the financial dependence on its former flagship product, Roundup herbicide.

This strategic report will identify and analyze the key issues currently affecting Monsanto and provide strategic recommendations. The report consists of five main sections: Company Background, Competitive Analysis, Financial analysis, SWOT Analysis, and Strategic Recommendations.

Vector recommends that Monsanto focus on the following initiatives:

- Aggressively market Roundup Ready 2 Yield before the patent expiration of the original Roundup Ready traits in 2014.
  - Temporarily lower Roundup Ready seed prices while raising its patent licensing fees on contracts that allow competitor development of its trait technology. Price promotions will alleviate the current frustrations of farmers, and help limit market share loss to DuPont into 2011.
  - By achieving high traction of Roundup Ready 2 traits and raising first generation trait royalty fees, Monsanto will be able to offset the minor market share losses from new competing substitute technologies.
  - Indirect promotion: obtain partnerships and program approvals to help

lower farmer insurance costs if they plant the most efficient and advanced Monsanto seeds.

- Allocate more capital and effort towards the completion of their drought-resistant seed trait development project.
  - Success in being first to market would greatly improve company image, allow the company to increase its technological advantage, and provide marketing leverage through the trait's contribution to solving world hunger and climate change issues.
- Aggressively extend presence into China to achieve an early competitive advantage in producing genetically modified (GM) rice seeds.
  - A proactive initiative will better position Monsanto to dominate the Asian GM rice market. China's gradual approval of biotech seeds and its increasing global influence have made the country an important player in the movement towards greater worldwide GM crop adoption and public acceptance.

## Company History

### **Monsanto's Beginnings (1901-1960)**

In 1901, John Francis Queeny started Monsanto Company to explore the potential for the artificial sweetener Saccharin. Monsanto first supplied its product to beverage companies, and was lucky enough to become Coca-Cola's main Saccharin supplier. As Coca-Cola's success grew, so too did Monsanto's, and by the 1920's the company decided to expand its production to include basic industrial chemicals. Monsanto's operations were handed over to Queeny's son, Edgar Monsanto Queeny, who became the CEO in 1928.

Monsanto entered the field of agricultural products in the 1940's, and thus began a period of rapid expansion in which the company became one of the top U.S. chemical companies. Monsanto also became a leading manufacturer of synthetic fibers and plastics (including polystyrene), and DDT (a well-known synthetic pesticide). These products were heavily criticized by environmentalists due to the negative side effects they produced.

While the media focused on Monsanto's reputation for releasing harmful toxins, the firm's senior management focused on the operational side and began exploring innovative manufacturing processes. This exploration eventually resulted in new technology facilities, the first computer-controlled ammonia plant in the world, and the development of the 'E-2 process', which kept ammonium nitrate fertilizer granules from sticking together.

### **The Birth of Monsanto's Agricultural Division (1960-1997)**

By the late 1950's, it was estimated that weeds, insects, and plant diseases accounted for \$13 billion worth of damage to seeds and crops. In an effort to capitalize on this problem and further expand its agricultural product portfolio, Monsanto established the Agricultural Division, for which it built 25,000 square feet of labs, offices, libraries and greenhouses.

In addition to DDT, Monsanto began to produce other agricultural chemicals (“agrochemicals”), such as herbicides 2,3,5-T, Lasso, and Agent Orange (a carcinogenic defoliant used in the U.S. Herbicidal Warfare program during the Vietnam War). In its early stages, the agricultural division was underperforming and struggling to turn a profit. However, in 1968, the herbicide Lasso was commercialized and became the primary corn and soybean herbicide in the U.S. for the next 20 years, thereby establishing Monsanto as a first tier agricultural producer.

By 1970, the company became the target of many protests due to rising global concerns for the environment. The newly formed Environmental Protection Agency similarly criticized the effects of Agent Orange and Lasso. In response, Monsanto began developing a new, environmentally friendly weed-killer. One of the company’s greatest advances came when a Monsanto chemist discovered a molecule called glyphosate, a synthesized compound that would go on to become the active ingredient in their herbicide product, named “Roundup”. Roundup herbicide, which killed most weeds by attacking their underground roots, proved to be safe for animals and naturally decomposed.

The company began to explore the potential of Animal Agriculture with the acquisition of Farmer's Hybrid Companies and the creation of a Monsanto cell biology research program. Monsanto also purchased a small equity position in Genentech, one of the first companies to explore biotechnology. As part of the new partnership, Genentech co-developed a product called POSILAC (bovine somatotropin), a synthetic hormone meant to increase the amount of milk dairy cows produce. Genentech’s research had a substantial impact on Monsanto’s strategic trajectory, and motivated CEO, John Hanley, to form an internal Molecular Biology Group. The effort of this group quickly became established as Monsanto's primary strategic research focus.

Monsanto continued to be the subject of a series of fines and lawsuits throughout the 1980’s. The success of Roundup helped to ease the growing costs of environmental lawsuits and clean-up programs, but it was obvious that Monsanto’s legal expenses and court-related costs were building quickly. The company’s bottom-line was

deteriorating and the threat of bankruptcy pointed to the desperate need of a complete company transformation.

In 1982, Monsanto scientists became the first to genetically modify a plant cell, marking the birth of agricultural biotechnology. With a significant first-mover advantage in place, the firm quickly began investing heavily into new biotech initiatives (e.g. facilities, research centers, hiring scientists). After billions had been spent, shareholders anxiously waited for marketable products to materialize. Despite the impatience from Wall Street, Monsanto continued to apply biotechnology to the new seed division by transferring the best traits from one plant generation to another, hoping to sell the resulting seeds as a premier agricultural product line.

In 1995, the U.S. government approved Roundup Ready soybean seeds, NewLeaf insect-protected potato seeds, and Bollgard insect-protected cotton seeds, making them the first commercial seed products resulting from Monsanto's biotech research. The agriculture division expanded their product portfolio over the following years, eventually surpassing the performance of the highly profitable chemical division. The Roundup products had expanded Monsanto's operating income margins, but forced the firm to become increasingly dependant on a single commercial brand name.

### **The 'New' Monsanto (1997-2009)**

During the late 1990s, the 'original' Monsanto began to sell off several portfolio companies that were essential to the firm's core businesses. Through a series of transactions from 1997–2000, the 'original' Monsanto entity that existed from 1901–2000 became a legally separate corporation from the current Monsanto Company. By 2001, it had spun off the industrial chemical and fibers divisions as a new entity, called Solutia Inc. and had entered a merger with Pharmacia, effectively making the 'old' Monsanto a subsidiary of Pharmacia Corporation. This subsidiary was then spun off of Pharmacia, creating the 'new' Monsanto that is currently operating.

Following the corporate restructuring, Monsanto quickly expanded the seed division through acquisitions, spending \$10 billion globally. The firm's buy-then-build

strategy pushed Monsanto to become the leading biotech seed company; consistently introducing first-in-kind genetically modified (GM) seed and trait technologies. By 2007, Monsanto's genetically modified seeds commanded a global market share of 90 percent. Roundup continued to be the world's best-selling pesticide, driving Monsanto to become the world's fifth largest agrochemical company, as well as the world's largest seed company. Monsanto continued to divest portfolio companies outside of its new seed division and officially sold off all animal-related businesses in 2008.

In an effort to further extend the company's dominance in the seed industry, Monsanto formed an investment holding company, International Seed Group, Inc. (ISG), providing growth capital to specialized vegetable and fruit seed companies. In the same year, Monsanto and Bayer CropScience AG announced a series of long-term business and licensing agreements related to key agricultural technologies.

Monsanto has recently pledged its commitment to sustainable agriculture and joined the Chicago Climate Exchange (CCX), North America's only voluntary, legally-binding greenhouse gas emissions program, and in 2009, announced a sustainable yield initiative to improve farmer lives in India, called Project SHARE (Sustainable Harvest– Agriculture, Resources, Environment). Monsanto has identified the Seeds and Genomics business segment as the most promising growth market.

Today, the company primarily focuses on the production of conventional and GM seeds and traits through several leading seed brands, including Asgrow, DEKALB, Deltapine, Seminis, and De Ruiters. Monsanto's seed products range from large-acre crops such as corn, cotton, oilseeds and wheat, to small-acre crops such as fruit and vegetable seeds. These seeds are bred to produce higher yields and are genetically modified to combat insects and control weeds. Monsanto has successfully built an agrochemical empire around its Roundup brand, and has primarily thrived in the seeds and traits industry through the success of several Roundup Ready seed and trait products, which make crops resistant to their own Roundup herbicide.



## Competitive Analysis

FORCE	Seeds and Genomics	Agricultural Productivity
<b>Internal Rivalry</b>	High	High
<b>Supplier Power</b>	Low	Low
<b>Buyer Power</b>	Medium	Low
<b>Entry and Exit</b>	Low	Medium
<b>Substitutes</b>	Low	High
<b>Complements</b>	Medium	High

Monsanto is the world's leading biotechnology-driven agricultural company and operates two primary business segments: Seeds and Genomics, and Agricultural Productivity. Both businesses are contained in the agricultural industry but are in different life-cycle stages and therefore offer separate growth opportunities. These two operating segments are classified as SIC 0119: agricultural production of cash crops, and SIC 2879: pesticides and specialty chemicals industry. Monsanto's genomics research, which is the scientific development of genetically engineered plant genes and traits, is widely recognized as the industry's first research team to successfully explore the potential of biotechnology-based agricultural products, causing an industry-wide transformation. This transition has proved to be a catalyst for a rapid trend toward consolidation within the agricultural industry and farming industry.

The agricultural industry has been largely affected by the growth of the human population. Given the limited supply of arable land, the agricultural industry has been able to develop new productivity tools and products to capitalize on the global need to expand the food supply in order to meet a growing future demand. The combination of these two factors has made crop growers more concerned with improvements to efficiency in the form of a product's 'yield per acre' ratio. In an effort to remain competitive and maximize profitability, farmers and growers began consolidating with the goal of growing more with less input. Thus, firms within the biotech agricultural industry compete on the basis of their seeds and chemical products' ability to increase crop production yields, capturing customers by offering a

maximized use of farming acreage and effectively lowering their cost of growing. Monsanto leads the industry with the best product portfolio and productivity technologies.

Only a few companies can be considered direct competitors to this agrichemical giant. Key industry players such as DuPont, Syngenta, BASF, and DOW AgroSciences, are mostly considered conglomerates that are diversified across several agricultural product and chemical businesses. As a result of this concentrated industry, leading firms often have a large product portfolio that changes over time as firms shift focus to new growth markets while divesting businesses in mature industries with limited opportunities.

As noted in the company history, Monsanto has recently lost their competitive advantage in the specialty chemical market with the expiration of the Roundup herbicide patent. In response, it has shifted the company's focus to the seeds and traits industry. Therefore, this competitive analysis will have an emphasis on the seeds and traits industry. The following review of Porter's Five Forces provides a summary of Monsanto's competitive positioning as well as key drivers of the biotechnology agricultural industry.

## **Internal Rivalry**

The biotech agricultural industry has a low level of internal rivalry due to the presence of strong patent protection in most core markets. This reliance on patent protection is a byproduct of the industry's acceleration into biotechnology in the 1990's. Patents are necessary because firms are forced to make significant investments into their research and development (R&D) in order to remain competitive. The industry has also seen an increasing rate of consolidation, resulting in a highly concentrated industry dominated by a few large firms with large intellectual property portfolios.

Since the biotech transformation, Monsanto has aggressively pursued patents for key innovative product developments in its Agricultural Productivity segment and has

maintained its industry leadership position by accumulating incremental market share in its Seeds and Genomics segment. This is primarily a result of inorganic growth through the acquisition of smaller seed companies, whose products add to Monsanto's constantly evolving product portfolio by offering a diverse set of growth opportunities. Monsanto expects to increase its seed industry market share and maintain an aggressive goal doubling its 2007 gross profit of \$4.2 billion by 2012, despite the fact that the company has been the world's largest seed company since their acquisition of Seminis in 2005.

The company's licensing and marketing practices have increased the firm's purchasing power and achieved a strong global reach that can only be matched by a few firms in the industry. Despite the fact that there are over 6,000 corn and soybean seed varieties and almost 180 independent corn and soybean companies in the U.S. alone, the direct competition and rivalry among the seed industry's top firms is very high. When presented with the demand for an unpatented technology, the largest industry players will often compete in being the first to market. This is a serious issue for the sustainability of Monsanto's market dominance. Due to the difficulty of consistently developing new technological advancements through in-house resources, large firms often compete for partnerships with research organizations that may have a developing technology useful for seed or chemical production. These partnerships come in the form of licensing contracts as well as acquisitions of corporate research arms.

It is estimated that Monsanto accounts for almost 90 percent of the world's genetically modified organisms (GMOs). Most of these GMO seeds are produced to resist the firm's own Roundup herbicide, which has allowed the firm to continually extract the benefits of their Roundup brand by building a vast moat of complementary products around it. The company is known for employing aggressive marketing and licensing practices to ensure widespread adoption of their Roundup Ready traits and platform products. This has given Monsanto a competitive advantage for several years, but has recently sparked an antitrust inquiry by the U.S. department of justice. The antitrust inquiry was initiated by its rival, DuPont, to

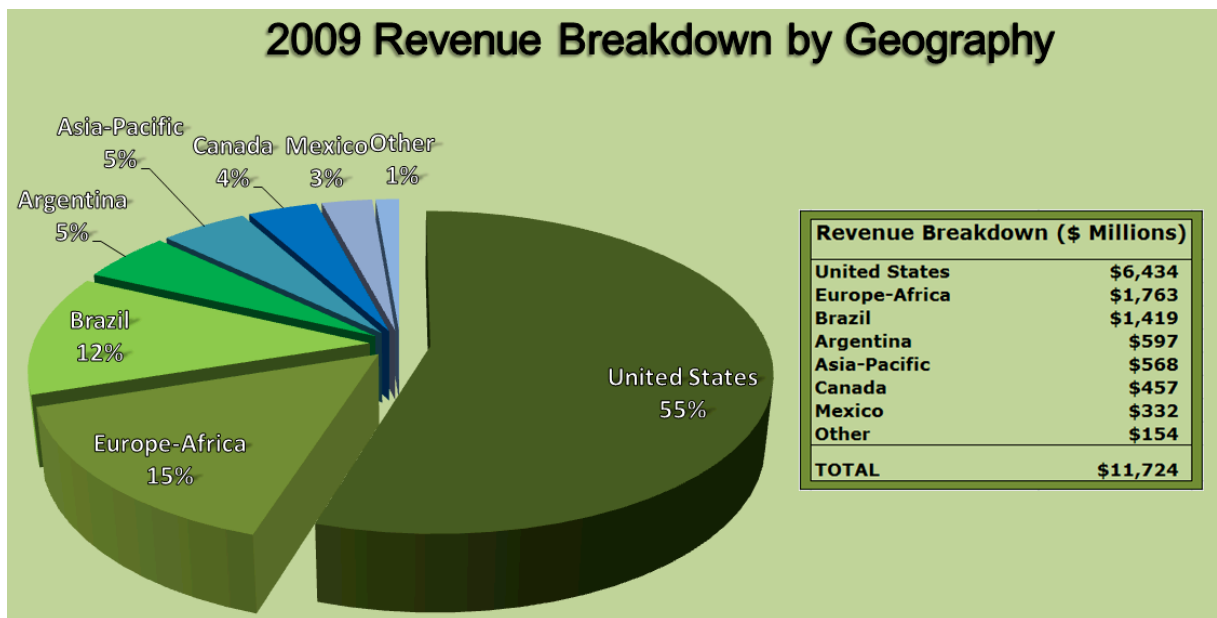
examine Monsanto's alleged 'anti-competitive marketing practices', suggesting that Monsanto may be abusing their market power by setting unreasonable limits in its patent licensing contracts. These recent developments have intensified industry competition and created great uncertainty regarding the future competitive environment for Monsanto, as well as the entire agricultural industry.

## **Entry Threat**

The threat of entry in this biotechnology-driven industry is low due to the many capital-intensive requirements necessary to remain competitive. The leading firms compete in developing new biotechnology-based products, as well as their speed to market, both of which make the industry highly dependent on significant levels of R&D investment. Companies like Monsanto also compete on a global level and gain substantial competitive advantages through broad international reach and a deep knowledge of the various regulatory and political environments. Industry entrants will not be able to gain these capabilities without extensive industry experience and capital investment. While research grants are the most likely form of entry for smaller firms, it is implausible for a small firm to gain the critical mass necessary to compete directly with companies like Monsanto. However, there is a threat of larger biotechnology firms making a lateral entry into the agricultural industry. These firms are well capitalized and have the capabilities to develop new technologies in the agricultural products space. In this situation, biotechnology firms have historically sold the technology or partnered with a larger, more experienced agricultural company. Similarly, Monsanto's lateral entry into the biotechnology field was achieved by initially partnering with Genentech, the first biotechnology company.

Large firms have substantial advantages over the smaller players in this industry. Monsanto has built a strong global reach and has developed the capabilities to scale their operations to several international markets. These international markets have presented new opportunities to penetrate fresh emerging markets and obtain major distributors in new regions. Monsanto's entry into Brazil and Argentina has served as an important source of revenue and profitability when the company's core markets

underperform relative to projections. By targeting a diverse set of international markets, Monsanto has been able to protect itself from the recent unpredictability of its core markets. These international regions help the company avoid extreme overall profitability losses of core markets due to various problems such as recessionary environments, regional commodity price fluctuations, or a shift in cultural food preferences. Monsanto's expansion has also created cost advantages, such as highly automated production processes and efficient cross-product marketing for complementary products. Only large, highly profitable firms have the ability to make large annual investments into R&D on a regular basis; industry entrants will find it difficult to remain competitive without these significant advantages. The chart below identifies Monsanto's international markets and shows each region as a percentage of the company's total revenue.



The industry's regulatory scrutiny specifically targets key players in the market. A tightening of the agricultural industry's regulations would focus on restricting the potential for anti-competitive practices by dominant firms, which could subsequently create new opportunities for entrants. Much of the existing scrutiny is concerned with the industry's patent protection laws and the potential for large firms to abuse their intellectual property rights. These patent protection rights offer the owner market power by allowing the exclusive production of the technology or by licensing the

technology to other companies for them to produce it. Regardless, this market power is a significant underlying driver of the biotech agricultural industry's competitive landscape. Despite the emphasis on a product's yield and productivity gains, product brand names do have traction in the commercial consumer segments of this industry. However, these only accounts for an insignificant percentage of the industry. The core customer segment, large crop growers and distributors do not have much preference in brand names and make purchasing decisions based on the indirect demand of consumer food preferences as well as productivity advantages.

## **Buyer Power**

The bargaining power of farmers and distributors is typically low, but, this varies across the different regions that Monsanto serves. In developing countries, farmers and distributors have almost no bargaining power as they are often fragmented across the region and thus purchase in limited quantities. To address this problem, Monsanto has set up a widely used system of financing for capital-constrained farmers to purchase the higher priced GM seeds. These programs tend to limit the subsequent buyer bargaining power in future purchasing periods. The consolidation of the domestic farming industry has increased the bargaining power of the company's large North American customers, both distributors and growers. Their increased size has not affected Monsanto, who has continued to charge technology premiums on their seeds and specialty chemicals without much actionable response. Monsanto justifies the price premium as the customer's investment in the company's development of more innovative and productive Monsanto seeds and chemicals.

While no single customer accounts for more than ten percent of Monsanto's 2009 net sales, the three largest U.S. agricultural distributors and their affiliates represented 18 percent of their worldwide sales and 33 percent of U.S. net sales. These top distributors have the potential to take advantage of their buyer power in the short-run by demanding advantageous terms on contracts. The Scotts Miracle-Gro Company has significant bargaining power as Monsanto's primary agent for the marketing and distribution of all consumer Roundup herbicide products. While this contractual arrangement has proven to be advantageous for both firms in the past, the Scotts

Company has recently demanded higher production and commission fees, forcing Monsanto to find more profitable drivers in their lawn-and-garden business to offset these increasing costs. However, these demands are likely a response to the poor performance of Roundup in 2009, which left distributors with excess Roundup inventory after the market was flooded with the launch of generic substitute glyphosate formulas.

Monsanto has exhibited its extended control over several levels of the food supply chain. In an effort to extract the maximum benefits of its technology developments, the company has targeted customers that have illegally extracted consumer surplus at the cost of the firm's profits. As a consequence for their aggressive practices, Monsanto has been criticized for taking small independent farmers to court for planting their patented seeds; several of the plantings were insignificant amounts and were claimed to be unintentional. A few years ago, Monsanto was successful in collecting a "voluntary indemnification fee" from Brazilian farmers after 70 percent of Rio Grande do Sul's Roundup Ready soybean seeds were illegally planted. These indemnification fees were collected through the use of a point-of-delivery (POD) system, implemented by forcing a network of grain companies that purchased these Brazilian soybeans, to act as Monsanto collection 'agents'<sup>1</sup>. The company has been able to limit buyer power by retroactively extracting lost profits from specific customer groups through aggressive litigation and network leverage.

While conventional seed and chemical products do not have many differentiating factors by nature, the biotechnology generation of agricultural products has created patented differentiating properties that are not realized or observable until at least one harvest season has passed. Farmers that are unfamiliar with the science behind selective herbicides and genetically modified seeds and traits will have some degree of switching costs. Since most of Monsanto's products offer the highest crop yields in the industry, farmers have not had much choice in selecting a reliable and cost effective seed product.

## Supplier Power

For Monsanto, supplier bargaining power mostly comes from the labor market. A strong demand for talented researchers and scientists is inherent to firms with an emphasis on producing first-in-kind products. Their commitment to extensive R&D investment requires advanced facilities and a diversity of specialized scientific talent. Monsanto has employed alternative routes of obtaining outside resources and scientists by establishing partnerships with research-based firms, acquiring firms with desirable employees or facilities, or even purchasing in-process research and development (IPR&D) from other research groups. Monsanto's strong capital position, superior facilities, and innovative track record attract world-class employees.

Both of Monsanto's business segments purchase raw materials from several suppliers. While the Seeds and Genomics segment directly produces its own supply of GM seeds, it also contracts with third-party growers for the supply of conventional seeds (corn, soybean, vegetable, cotton, canola). The cost and availability is primarily dependent on the seed yields, weather conditions, and global supply and demand. Individually, these third party growers do not have any supplier power over the Seeds and Genomics segment.

The Agricultural Productivity segment purchases a significant amount of basic and intermediate raw materials, including energy, through long-term contracts with several suppliers; overall, current agrochemical raw material pricing is substantially higher than existing pricing under its contracts<sup>2</sup>. Only a few major suppliers provide important specific raw materials, but the market for these materials has been balanced and is expected to remain so.

Monsanto also manufactures key chemical ingredients for its own Roundup herbicide, including disodium iminodiacetic acid (a key ingredient for glyphosate herbicide), and produces its own global supply of elemental phosphorus. The firm owns multiple mineral rights that provide the necessary resources to maintain a long-term supply of phosphate ore for any future product needs. The company's vertical



integration of key material production is not highly profitable; it presents new expansion opportunities for the company as the performance of the agricultural productivity segment continues its downward trajectory.

## **Substitutes**

There are few differentiating factors of conventional seed and chemical products that warrant a strong consumer preference. However, among biotech agricultural firms, seed and chemical products have technologically advanced properties that are patented. Biotechnology patents, which cover agricultural biotechnology discoveries, provide protection to the owner for 17 years in the US. During this time, the owner is allowed to exclude competitors from “making, using, offering for sale, or selling“ an invention<sup>3</sup>. Patent owners are also able to license the rights to other companies, sometimes allowing competitors to use the technology in their products and/or further research. Monsanto has taken advantage of several patents all over the world, and has employed a broad licensing strategy for its Roundup Ready traits and other seed technologies. This has resulted in Monsanto owning the rights to a majority of the GM seed products, many of which are directly competing seed lines.

The threat of substitution for these patented products is low until the patent expires and generic substitutes begin to flood the market, resulting in depressed market prices and a severe narrowing of the product’s profit margins, which is especially damaging to the patent holder. The industry observed this scenario unfold with the expiration of Monsanto’s Roundup patent. The product is currently facing a global flood of generic substitute supply and price pressures. The firm has been forced to downsize the entire Agricultural Productivity segment by cutting 1,800 jobs, or 8% of the firm’s staff and changing the SG&A cost structure. The expiration of the Roundup patent and the following substitute threat, was the catalyst for a large scale corporate restructuring. The table below illustrates Monsanto’s ability to maintain a high market share after the expiration of its Roundup herbicide patents. The recent saturation of the generic substitute market has created an unexpected shift away from their brand name glyphosate product.

**National Market Shares After Patent Expiration**

Country	Patent Expiration	2001 Market Share
Argentina	1984	75%
Australia	1988	91%
Brazil	1983	82%
Canada	1990	95%
France	1991	85%
United States	2000	98%

Source: Salomon Smith Barney

The largest substitute threat stems from the food preferences of end consumers. Certain regions of the world have a strong negative perception of genetically modified food, even in the form of its originating seeds. The movement towards all natural, organic, and locally-grown food consumption is aggressive in some regions and has the ability to directly influence the overall demand of the farmers that produce food. If these movements do gain momentum in Monsanto's targeted markets, then there is the potential for a gradual demand shift among end-consumers. This shift would be transferred to the farmers and growers, forcing their distributors to carry conventional seed products as a substitute to the genetically altered seeds. As mentioned earlier, conventional seeds are clear substitutes to GM seeds but have almost entirely disappeared from the U.S. market. While this does not pose a large threat to the GM seed industry, it serves as a well-known default product, should the GM seed industry suddenly become unattractive to farmers or end consumers. This situation is entirely possible, especially given the number of studies that indicate possible adverse environmental and health side effects of certain GM seeds and specialty chemicals. The debate between natural food and GMO adoption is largely based around the various economic and agricultural productivity benefits, as well as weighing the health and environmental costs. The debate has fueled an abundance of studies and scientific trials with very few reliable results; this is because the composition of GM and natural crop food varies across several growth and agronomic condition factors. This results in hundreds of GMO studies that often 'indicate' or 'signal' potential toxicity or environmental harm, while the long-term effects are still largely unknown due to large gaps in the necessary data. It is extremely important to note that, GMOs have only been broadly commercialized for 14 years, meaning there could be multiple adverse long-term effects as the industry

progresses. This is the first mover disadvantage. Monsanto was the first to venture into a highly profitable industry and dominate the market, but it also acquires the many risks inherent in a completely new field of high-technology food supply. If a significant health side-effect were discovered, all regulatory officials around the world would attempt to phase out GMO usage, and eventually replace them with conventional seeds. It is an unbelievable situation, but it is important to consider that after only 14 years, there are already several GMO health concerns that might only require more data to prove. Within the past few years, studies have revealed that DNA does not always fully break down in the digestive tract, which could lead to the possibility of some altered GMO DNA causing widespread antibiotic resistance in the human body.<sup>4</sup> All new developments concerning GMO side-effects are highly publicized in the media and information spreads quickly through a large global network of anti-GMO organizations, applying pressure on regulators to actively protect consumer health and to be cautious in approving new GM crops. While conventional seeds would not be an active catalyst for these threatening scenarios, the industry would quickly become a superior alternative and would regain its place in the traditional food chain.

Monsanto's failed penetration of the European agricultural market in the early 2000's is a complex example of the underlying power of cultural preferences and government regulations. It makes sense that the untapped European market would serve as a challenging but substantial growth opportunity for Monsanto. The European Commission is the regulatory agency responsible for protecting the European Union (EU) citizens. They regularly conduct consumer polls, called Eurobarometers, in order to better understand the tendencies of consumers. In the late 1990's, European consumers largely viewed GMOs as 'Frankenstein Foods', which led to extremely low demand and public outcry over the possibility of GMO biotech products entering the commercial market, and eventually contaminating all other natural foods.

Monsanto's initiative was untimely, as it launched shortly after the BSE (Bovine Spongiform Encephalopathy, a.k.a. Mad Cow Disease) and dioxin-in-food scandal that was highly publicized; these scandals served as a platform for many Greenpeace and all-natural food organizations to spread their message and gather a following.

The overwhelming opposition to the entry of biotech agricultural companies pressured (EU) policymakers to take an active role in protecting the public's health, and strongly influenced the European Commission's decision to initiate a six-year de facto moratorium on all GMOs in 1999.<sup>5</sup> This regulatory restriction strengthened and spread the EU's anti-GMO sentiment. By 2001, the Eurobarometer opinion poll showed that 94.6 percent of EU consumers demanded the right to choose between natural and GMO, 85.9 percent wanted to know more details before eating GMOs, and 70.9 percent did not want any form of GM food.<sup>6</sup> Monsanto is still unable to take advantage of the large growth opportunity that the European market offers due to the European government's further movement away from GM crop adoption. This failed initiative was seen as a warning of the strong influence that these natural food movements are capable of having on the public's GM acceptance and regulatory decisions.

One of Monsanto's primary goals is to consistently launch products that are on the leading edge of the industry's high technology. If a company develops a new biotech product with an immensely superior technology, it can achieve significant market power, and thus, the ability to raise prices without losing much demand. Monsanto has been successful in achieving this goal several times over, and have continued to raise their prices accordingly. Within the last three years, U.S. seed prices have increased 64 percent, and Monsanto's licensing royalty fees have increased the price of Roundup Ready soybean trait to \$15.65 per bag, from only \$6.50 in 2000. Additionally, Monsanto has just introduced 'Roundup Ready 2 Yield', the firm's second generation of Roundup Ready traits, which are priced at \$39.75 per bag<sup>7</sup>. These dramatic price increases have slowly begun to frustrate growers and have caused some to look for GM seeds of lower quality and price as a viable high-technology substitute. A recently released 35-year study by the Organic Center on seed pricing indicates that until 1997, farmers spent 4% – 8% of their farm income on seeds, while farmers are currently spending an average of 16.4 percent of their incomes on genetically modified soybeans<sup>8</sup>. Farmers have expressed their frustration with the seed price increases and have resorted to collective bargaining by bringing the issue to state-level officials. This collective frustration has caused seven U.S. state

attorneys general to investigate Monsanto's anticompetitive actions, which seem to be the source of the 'increasingly unreasonable' seed prices throughout the industry. Growers that are concerned with cost-savings may still see the crop yield advantages as a sufficient justification for the growing price, but Monsanto should be worried that DuPont's new low-priced seeds are expecting to gain 1%-2% market share. This shift away from high-priced superior technology may be a result of the widespread recessionary commodity prices in the agriculture industry. Regardless, Monsanto must quickly address this emerging substitute threat before competing firms have a chance to build upon the demand shift and gain traction with a new market offering.

## **Complements**

Monsanto's seed and chemical products have many complements within the industry. In fact, the firm has successfully built several seed product lines around their Roundup herbicide to enhance the productivity of both products, and the company plans on gaining traction with their second-generation platform trait, Roundup Ready 2 Yield.

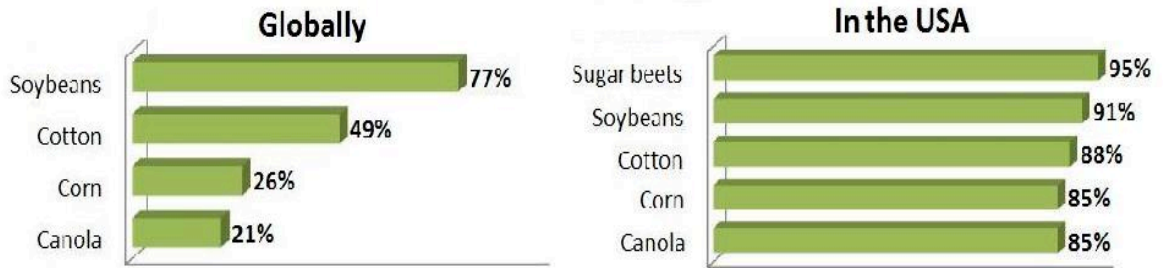
Monsanto's strong brand recognition in the farming community has allowed them to create alternative partnerships in an effort to reduce customer costs. They have recently made key agreements with farmer insurance companies, distribution agents, and local governments as new marketing channels, built around the cost-saving and efficiency advantages of their products. Earlier this year, Monsanto marketed their new products platforms under a USDA's Risk Management Agency program to lower farmer's crop insurance premiums for growers planting 75 percent of their corn acreage with YieldGard VT or Roundup Ready Corn 2<sup>9</sup>. Entrants will find it difficult to obtain the scale necessary to make these competitive partnerships.

For Monsanto's main businesses, demand is directly driven by weather and environmental expectations for the next growing season, as well as the health of the region's crop export market. While these forces affect the overall performance of the agricultural industry, biotech agricultural firms must worry about several other

complimentary forces concerning the genetic alteration of the world's food supply. For these firms, general demand is indirectly driven by the end consumer. The end consumer has their choice of a wide variety of food that is produced with several different types of ingredients, and it is obvious that the general population varies greatly in their food preferences. For firms that use biotech, the most important consumption choice an individual can make is their stance on consuming genetically-modified foods. Many people, and certain cultures, only consume foods that are produced with 100 percent natural ingredients. This food preference has evolved into a highly publicized debate between those that fear the negative long-term effects of unnatural food consumption on the human body and those that are concerned with our ability to meet the future needs of a growing population.

It is understood that that the preferences of the end-consumer has a diminishing effect on the industry's product demand as you move further upstream in the food supply chain. However, underlying food consumption trends and cultural food movements have a significant influence on the success of any biotech-driven industry in food supply chain. For large firms like Monsanto, long-term financial performance is greatly affected by the global balance of these GM and biotech issues. The U.S. has almost completely adopted the use of GM crops, while regions like Europe and Germany have rejected all genetically altered food, claiming that they pose long-term ecological and health problems<sup>10</sup>. Nevertheless, the global debate has been shifting as other governments are beginning to accept GM crops. In November, China announced the approval of biotech rice and corn varieties, which has potential to gain momentum towards increasing the adoption rates of Asian countries. China's growing influence on the world and its increasing activity in the GM markets will continue to support a global shift in GM acceptance. The worldwide adoption of GM crops increased by seven percent last year, providing further evidence that these crops are being adopted at a rapid rate<sup>11</sup>. Below is a chart of the U.S. and global adoption rate.

Percentage of major crops that were genetically engineered in 2009:

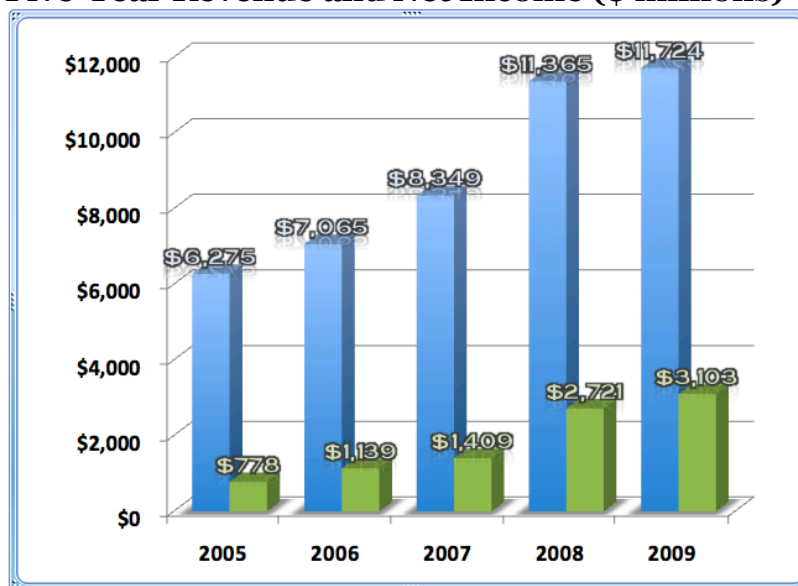


Sources: International Service for the Acquisition of Agri-biotech Applications and the U.S. Department of Agriculture

## Financial Analysis

Monsanto is considered a powerful R&D engine, and dominates the seeds and traits market with a vast majority of the market share. The company has a market capitalization of \$39.4 billion, the largest in the industry, and grossed \$11.7 billion in revenue with a net income of \$2.1 billion. Monsanto's main competitors are DuPont, BASF, Syngenta, and DOW AgroSciences. These companies are large conglomerates involved in agriculture, applied BioSciences, specialty chemicals, and several other product lines. DuPont is Monsanto's most direct competitor in terms of size and global reach, with sales of \$26.8 billion, more than doubling Monsanto's revenue. The chart below shows the company's consolidated revenue and profit levels over the past five years.

**Five-Year Revenue and Net Income (\$ millions)**



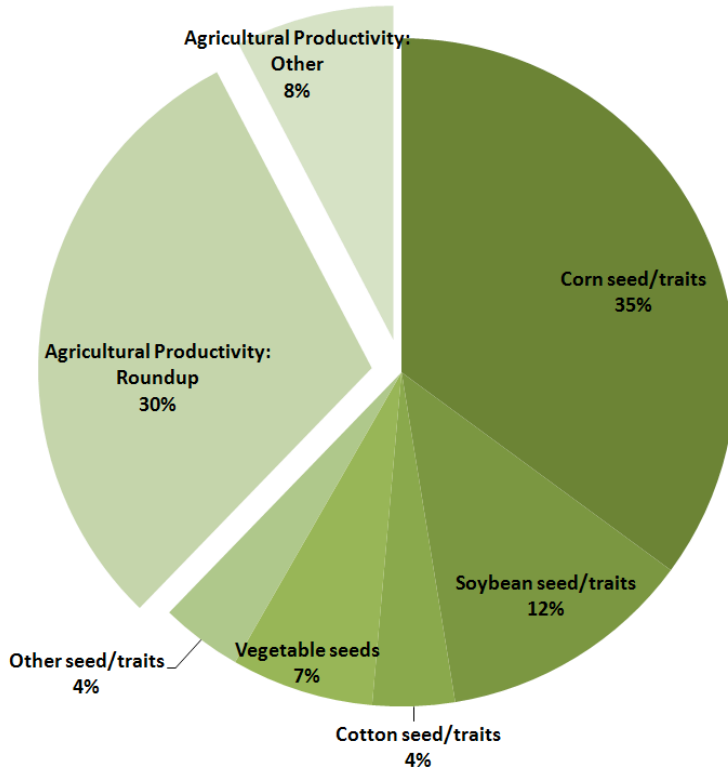
Monsanto's financial success is highly dependent on the approval and performance of a few first-in-kind products. Additionally, the firm's speed to market with the adoption of new technologies is essential in maintaining a leading industry position. To fund the development of these new products, Monsanto spent approximately \$1.1 billion on R&D expenses last year, representative of their reinvestment target of 9% – 10% of total revenue. The stock market has historically valued the R&D product pipeline as the core driver of sustainable growth. The firm's current product pipeline



has seen consistent regulatory approvals and is poised to launch new product platforms that will expand the seeds and traits business into 2012<sup>12</sup>.

Monsanto's premier herbicide, Roundup, has been the main source of revenue for the past decade, but has suffered substantial losses due to the expiration of Roundup's key patents and a saturated market of generic substitutes. The firm has recently restructured the Agricultural Productivity business, in order to minimize the overall impact of the segment's negative performance. The company's drop-off in the Agricultural Productivity sales and profitability performance was due to the unexpected transition of the global Agro-Chemical market that followed the Roundup patent expiration. The restructuring, or downsizing, of their Roundup division includes cutting 1,800 jobs and two annual expense charges totaling \$550-\$600 million, which was initially announced as a \$350-\$400 million restructuring reserve to cover the financial obligation of terminating 900 employment contracts. Despite the fact that the job cuts have doubled to eight percent of their workforce and the required amount for the restructuring reserve has increased by \$200 million, analysts and investors in the market see this structural change as an appropriate complement to the shift in the firm's corporate strategy to a focus on Seed and Genomics. The restructuring will allow the company to reduce future selling, general and administrative (SG&A) costs by \$200-\$250 million a year, realizing about a third of the benefits in FY2010 and reaching full cost-saving potential in FY2011.<sup>13</sup> These cost saving efforts will help reduce the Agricultural Productivity segment's decline in profitability over the following years.

2009 Revenue Brakdown by Segment



	<b>2009</b>
Corn seed and traits	\$4,113
Soybean seed and traits	\$1,448
Other Seeds and Traits	\$462
<b>TOTAL Seeds and Genomics</b>	<b>\$7,297</b>
Agricultural Productivity: Roundup	\$3,527
Agricultural Productivity: Other	\$900
<b>TOTAL Agricultural Productivity</b>	<b>\$4,427</b>

A new seeds-and-traits strategy has shifted Monsanto’s focus to developing and growing their seeds portfolio by gradually acquiring smaller seed companies to inorganically gain market share. As part of their revised strategy, Monsanto extensively licenses and markets their seed patents to competitors, allowing them to include patented Roundup Ready traits in their own branded products. While foregoing the higher-margin monopolistic profits that come with an owner-exclusive patenting strategy and little competition, the firm has achieved incredible industry-wide adoption of their branded technology which has resulted in their Roundup Ready seed traits embedded in 82 percent of the corn and 93 percent of the soybeans produced worldwide last year<sup>14</sup>. This marketing strategy has led to revenues of \$7.3 billion from sales and licensing of seeds and seed traits, accounting for approximately 62% of the firm’s total 2009 consolidated revenues<sup>15</sup>. Analysts expect the success of the Seeds and Genomics product portfolio to extend over the long term.

### Five-Year Revenue and Net Income Growth

(\$ Millions)	2005	2006	2007	2008	2009	TTM	CAGR
<b>Sales</b>	\$6,275	\$7,065	\$8,349	\$11,365	\$11,724	\$10,772	17%
<b>Growth</b>	13%	18%	36%	3%			
<b>Operating Income</b>	\$778	\$1,139	\$1,409	\$2,721	\$3,103	\$2,317	41%
<b>Growth</b>	46%	24%	93%	14%			
<b>Income Tax</b>	\$104	\$330	\$403	\$899	\$845	\$639	
<b>Net Income</b>	\$255	\$695	\$993	\$2,024	\$2,109	\$1,534	70%
<b>Growth</b>	173%	43%	104%	4%			

Source: Monsanto Company 2009 10k

Monsanto's balance sheet and liquidity positions are extremely strong. Cash from operations has averaged 24% of sales over the past 5 years, allowing the firm to consistently reinvest in product R&D and grow inorganically through the regular acquisitions of seed and chemical companies. Monsanto can easily cover their debt obligations of \$1.72 billion with \$2.23 billion in cash at the end of FY2009. Even through the recession, Monsanto has expanded their top-line and bottom-line figures at an average annual rate (five-year CAGR) of 17% and 41%, respectively. It is important to note that there is seasonality in the sales cycle of Monsanto's agricultural businesses and, as a result, the firm has a fiscal year end of August 31<sup>st</sup> to synchronize quarterly and annual results. In fiscal year 2009 (FY2009), approximately 72% of Seeds and Genomics sales occurred during the second and third quarter.

Analysts expect earnings of \$1.73 per share for the most recent Q2 FY2010, lowered from \$2.16 the prior year, while revenue likely fell 2.5%<sup>16</sup>. Monsanto recently announced that Q1 FY2010 revenue fell 36%, year-over-year, to \$1.7 billion, implying that the firm will have to find expandable areas within their business segments in the subsequent quarters in order to maintain their promise of consistent earnings growth for shareholders<sup>17</sup>.

International business has accounted for 60% of the Agricultural Productivity segment's total sales, and 36% of the Seeds and Genomics' total sales. Monsanto has already extended their presence into many international markets and continues to see strong potential growth opportunities outside of the U.S. The company expects to

penetrate these markets as they have with Argentina and Brazil in the hopes of realizing similar results in the long term. The adoption of the region is usually entirely dependent on the approvals of individual GM seeds by its government. China is one of these attractive regions, as the use of biotech agriculture and GM seeds have seen a recent increase of regulatory approvals<sup>18</sup>. Despite the near-term pressure to perform on the back end of FY2010, Monsanto has reaffirmed its annual forecasts. Analysts have been confident that the company has gained enough momentum in progressing with their medium-term strategic plan into 2012, but several investors have doubts as to whether the company can meet its ambitious five-year goal of doubling profit by 2012 to \$8.4 billion to \$8.8 billion.

Recent concerns over the regulatory environment in the agricultural industry may have a direct impact on the company's patent licensing strategy. An increasing likelihood of regulatory actions against Monsanto could quickly increase court-related expenses and undermine the core strategies that built the company's seed empire, leaving the company with a diminished competitive position. These concerns are becoming increasingly real as the U.S. Department of Justice has recently initiated an antitrust investigation of Monsanto. DuPont, who requested the investigation, argues that Monsanto has used restrictive patent licensing strategies and aggressive litigation practices in the dominance of its Roundup Ready brand to prevent competitors from bringing innovations to market. The rival company claims that these strategies have created an ongoing cycle of Roundup Ready traits dominating the market offerings while thwarting all efforts for others to compete with the technology<sup>19</sup>.

Aside from Monsanto's long-standing reputation for its involvement in a variety of highly publicized legal cases, both as a plaintiff and defendant, the company also lobbies multiple governmental departments regarding several important regulatory issues. Monsanto spent \$8.5 million on lobbying in 2009 in order to maintain their influence on domestic political and regulatory decisions. The recent antitrust case, as well as other regulatory implications of the transition to the Obama administration, has pressured the firm into spending \$2.5 million on lobbying in Q4 FY2009<sup>20</sup>. Overall, the shift in the U.S. political setting has created a difficult situation for

Monsanto, where existing intellectual property rights are being challenged to prevent predatory competitive behavior by dominant firms. Given the company's influence on the GM food movement and their deep knowledge of the global industry, it is not surprising that several former Monsanto employees have been appointed as U.S. public officials. Last year, former Monsanto lobbyist Michael Taylor became a senior adviser to the Food and Drug Administration (FDA) Commissioner on food safety<sup>21</sup>. Similarly, Monsanto has hired FDA and EPA officials as key executives on multiple occasions.<sup>22</sup>

### Five-Year Stock Performance: Monsanto vs. Syngenta vs. DuPont vs. S&P500



Source: Google Finance

Monsanto's stock price has been significantly depressed from its 2008 high of \$140 and is currently fluctuating around \$73 per share. The price decline is primarily due to the worse-than-expected performance of Roundup and the market's uncertainty in assessing the company's dramatically altered focus and strategy. There has been a large amount of activity and discussion among options traders, making straddled bets on an anticipated increase in Monsanto's stock price volatility. These traders are hoping to take advantage of the company's April 7<sup>th</sup>, Q2 FY2010 earnings announcement, when analysts are expecting the company to report earnings per share of \$1.76, compared to the \$2.16 per share the company made last year. Shares have fallen about 15% in this year's bull market.<sup>23</sup>

## SWOT Analysis

### Strengths

- ◆ Industry leader with the best technological capabilities and seed products
  - Superior profitability and market capitalization → Global market power and strategic international opportunities
  - Several firms eager to partner and co-develop new technologies
- ◆ Strong revenue growth through steady market share gains and pricing strategies
- ◆ Consistent market penetration of new products/technologies
  - Robust pipeline of developing products (platform products and next generation developments)
  - R &D commitment to leverage existing intellectual property portfolio (target of 10% of sales reinvested)
- ◆ Strong brands through aggressive marketing, patent litigation, and licensing practices
  - Capabilities to build product portfolios around a platform product or technology which provides brand protection
- ◆ Superior lobbying practices
  - Strong relationships with key U.S. officials and large investments into lobbying (2009: \$8.5 million)

### Weaknesses

- ◆ Negative public perception (Genetically modified food, Past litigation)
- ◆ Poor adjustment to Roundup's patent protection expiration
  - Inventory hangover and diminished profitability has caused the firm to squeeze other segments for 'required' earnings growth
  - Earnings are expected to decline solely from the commodity chemical business
- ◆ Poor forecasting of cultural differences in food preferences
  - Initiative to European market penetration was a costly failure

## Opportunities

- ◆ New strategic plan building momentum
  - Largest platform product launch and corporate restructuring
- ◆ Room for international growth- Seed division finding success in developing markets
  - Commitment to replicating North America's success in Brazil, Argentina, and India
  - Recently approved for their soybean seeds in China
- ◆ Top production & distribution capabilities attracts best partnerships for co-development of new technologies

## Threats

- ◆ Potential demand shift to lower-priced GM seeds
  - New high-priced seed marketing strategies will have to be modified
- ◆ Possible increase in regulatory actions will result in unpredictable costs (Anti-competitive and Consumer/environmental lawsuits)
  - DuPont's antitrust case has intensified industry competition among top firms
- ◆ High potential for discovery of adverse environmental and health effects could reverse GMO adoption momentum and trigger regulatory bans and usage blocks
  - Bacterial DNA from GM crops have the potential to remain in the digestive tract and cause resistance to antibiotics
  - Weeds are becoming increasingly resistant to herbicides, diminishing the functionality of Roundup and creating further environmental problems
- ◆ Generic Roundup substitutes expected to continue to cut into earnings
- ◆ Failure to move products to market quickly will diminish competitive advantage and market share
  - New seed and trait technologies are expected to cause a large industry shift in the near to medium term
- ◆ Negative public perception

- Further shift away from transgenic food will cause an industry shock
- Movement for local and organic foods could gain momentum
- ◆ High exposure to weather and commodity grain prices

## Strategic Issues and Recommendations

Vector will address the strategic issues for Monsanto's businesses, as they currently face a series of obstacles in the short-term, medium-term, and long-term. This section will present the current setting of each issue and provide strategic recommendations that we believe to be feasible options, taking Monsanto's existing corporate strategy into account. Our recommendations are based on allocating capital and strategic focus to potential growth areas within the company's operations.

### Near-Term

The agricultural industry has recently experienced several changes: a surge in consolidation, wide-spread frustration over increasing seed prices for farmers, and an increase in regulatory lawsuits. These new developments are specifically focused on Monsanto, and have created an especially difficult situation for the company in the near term.

Under the Bush administration, Monsanto operated as a very successful dominant firm, but Christine Varney, head of antitrust division in President Obama's administration, recently explained that she plans to be more aggressive in penalizing firms engaging in anti-competitive behavior<sup>24</sup>. In August of 2009, DuPont requested an investigation on Monsanto's licensing and marketing strategies for the Roundup Ready products, accusing the company of illegal anti-competitive practices. As previously mentioned, Monsanto has licensing contracts in place with several competitors, allowing certain Monsanto-owned seed technologies and traits to be used in the production of the competitor's product. This has created a highly competitive environment in the GM seed industry, but has also guaranteed seed sales or licensing revenues to Monsanto on approximately 90 percent of the seeds planted



worldwide.

Monsanto's contract with DuPont's Hi-Bred Pioneer seed brand allowed the use of the Roundup Ready seed technology but excluded DuPont from using the Roundup Ready gene in the development and further research of new DuPont platform products. The lawsuit claims that Monsanto has engaged in other predatory licensing restrictions with their distributors, including cash incentives for switching their inventory of other seed brands to Monsanto's, or similar royalty fee rebates for inventories with over 90% Roundup Ready seeds<sup>25</sup>. Additionally, the U.S. Justice and Agriculture departments are holding a series of workshops to see if the seed-industry's consolidation is harming crop growers and agriculture competition. The workshops were organized to explore the flood of complaints from farmers, claiming that firms like Monsanto are responsible for unreasonable increases in the pricing of GM seeds. The company has just recently felt the financial impact of these frustrations as a decline in demand for higher-priced GM seeds has cut into the firm's profits. Meanwhile, DuPont's Hi-Bred Pioneer seed unit is expected to gain 1%-2% market share by promoting its lower price point.

Vector Strategy Group proposes that the company continue to establish licensing contracts while avoiding any explicit predatory terms, and aggressively market its new Roundup Ready 2 Yield at a discounted price, before the original Roundup Ready's patent expires in 2014. Monsanto's monopoly over the Roundup Ready platform has intentionally halted the further development of new traits by competitors, supporting a strong argument for anticompetitive behavior. The antitrust investigation will determine whether Monsanto has abused its market power and patent protection rights to systemically keep competitors from gaining market share. DuPont classifies the competitive situation as a classic platform monopoly, where competitors need access to a facility (or technology platform) in order to compete against the monopolist. Thus, Monsanto must be proactive in gradually allowing competitors to develop their first generation of Roundup Ready traits while aggressively marketing the second generation Roundup Ready 2 Yield seeds at a lower price. At the same time, the firm should also lower the prices of the original

Roundup Ready trait while dramatically raising the licensing royalty fees, which should be justified as a premium that allows competitors to build off of the Roundup Ready trait technology. The company's high price point and technology premium fees are posing problems for its product demand as Monsanto attempts to obtain high market penetration. A discounted price on the newest generation of seeds should be a short-term offering to regain market share and stop the shift away from the Roundup Ready brand, but the company should keep a close eye on the gradual market share loss to DuPont's new low priced seeds.

With this pricing and licensing strategy in place, competitors will be able to develop and launch new seed products in the near term. Monsanto may risk losing a small portion of their original Roundup Ready market share but these losses will be balanced by higher royalty fees. The price reductions will alleviate customer tension with farmers and effectively provide competitors with new trait development potential at a higher price. Given the high margin nature of the industry, these competing firms can afford to justify a large fee increase with the offering of relaxed contractual terms. Competitors will also be better able to absorb the bundled price increases than farmers and growers, many of whom watched the price of GM seeds increase 64 percent over the past three years. It is essential to achieve similar traction with Roundup Ready 2 Yield in order to maintain a high adoption rate of the most advanced Monsanto technology. Keeping a high sales volume will be necessary to make up for the product's lower profit margins. While the lower pricing points will hurt the bottom-line, the current demand shift to lower-cost seeds may prove to be a disastrous long-term trend for Monsanto, currently claiming that its high price is reasonable and completely justified by superior technology. By lowering price and allowing looser contractual terms, Monsanto will be able to retain customers, increase licensing revenue, and allow competing products to enter the market, all of which will be at least a generation behind in development.

To promote Roundup Ready 2 Yield's superior productivity gains and cost-saving potential, Vector recommends that the company launch an initiative to obtain more insurance partnerships that provide insurance premium discounts to farmers,

contingent upon planting a high percentage of Roundup Ready seeds. These can be done through direct contracts or regulatory programs, similar to the partnership with USDA risk management, which encouraged growers to plant a majority of Monsanto's high yield seeds for an insurance fee discount. These additional discounts act as purchasing subsidies for participating growers and provide effective incentives to help gain traction among growers that are concerned with Monsanto's expensive seeds.

Should the antitrust case rule that Monsanto engaged in anticompetitive behavior, the firm will face substantial costs that could be extremely detrimental to the firm's near-term financial flexibility and would require a reassessment of their competitive advantage, especially in an industry without extensive intellectual property protection. Monsanto should also continue to lobby Congress, the department of Agriculture, the Environmental Protection Agency and other agencies concerning issues for which they have previously lobbied, including patent reform, clean energy, environmental litigation, global food security, international tax reform, labor issues, antitrust law, domestic and foreign trade and health care reform. To compliment Monsanto's quarterly lobbying expenses, the company should similarly continue to develop their executives and affiliate members into attractive public official candidates.

### **Medium-Term: Drought-Resistant Trait Technology**

Despite the pressure and distraction of the anti-trust case, Monsanto's operations should be directed towards moving ahead to develop the next drought-resistant seed product. The company has already made claims of owning the industry's first GM drought-tolerant seed project to move into the regulatory phase of R&D. This development would revolutionize the biotech agricultural industry, more so than the development of Roundup herbicide, and would be recognized as a step towards solving world hunger issues. However, other firms are quickly engineering the gene to be superior to Monsanto's, and some of these research groups are using different breeding techniques that have eliminated genetically modification in the seed's

production process. While management is obviously aware of the profitability potential of this technology, Vector Strategy Group believes that Monsanto should allocate more resources and capital into developing the existing drought-resistant gene project and form an initiative towards partnering with a diverse group of specialized research firms. There is also the option of assessing competitors' superior drought-resistant projects, and acquiring the project's in-progress R&D (IPR&D), a strategy that Monsanto has employed in the past. A buy-or-build analysis will indicate if the price of acquiring the IPR&D is worth forgoing the development obstacles. However, it is incredibly difficult to estimate the asking price of a technology with varying levels of importance across firms and groups.

Aside from the financial benefits of obtaining the patent rights or being first to market, this development would have a large positive impact on the global acceptance of genetically modified seeds. This specific drought-resistant gene is expected to help the poorest farmers in the world grow and feed their local markets or villages, causing most to view the potential trait as more of a scientific accomplishment than a successful seed product.

Seeing as the world's poorest farmers will never be a lucrative customer target group, large additional investments cannot be justified on a stand-alone basis. However, Monsanto would be able to benefit from trait licensing and seed sales, an improved image through philanthropic marketing, and a further shift towards global acceptance of GM seeds and food. While many of these benefits would help the GM seed industry as a whole, Monsanto would realize a larger share of the profits given its industry leadership position. Aside from the global respect that would come with solving major world hunger and climate change issues, the accomplishment of developing a commercially available drought-resistant trait would serve as a worldwide marketing platform that Monsanto would be provide substantial leverage in most areas of the company's operations. Given the company's tendency to broadly license their exclusive technology patents, the trait would also present a wide range of partnership opportunities that could lead to Monsanto's next business venture (i.e. their initial partnership with Genentech). Monsanto should divest the lowest performing business

subsidiaries and hold off on any high-priced acquisitions for the remainder of 2010, and possibly into 2011. This will provide a significant pool of capital for research efforts, as well as a necessary shift away from non-performing segments. The main concern moving forward will be Monsanto's ability to manage an additional, high growth product line.

### **Long-Term: Aggressively move into China**

Monsanto has valuable experience in entering a new market, including domestic product launches and ventures into new international regions. The company has successfully penetrated international markets such as Canada, Brazil, Mexico, Argentina, Vietnam, India, and Indonesia<sup>26</sup>. These governments have adopted the use of GM crops and more governments are slowly exploring the benefits of GM technology as a solution to larger national concerns. As mentioned earlier, there is a global debate concerning biotech foods and the campaign for worldwide GM crop adoption and biotech GMO acceptance. The split between the critics and proponents is largely balanced, but heavily dependent on a handful of key government and regulatory decisions; the U.S. has almost completely adopted the use of GM crops, while regions like Europe and Germany have rejected GM crops, claiming that they pose long-term ecological and health problems<sup>27</sup>. China's growing population and increasing activity in the GM markets seem to support a global shift towards GM acceptance. The world-wide adoption of GM crops increased by seven percent last year, which supports recent evidence that indicates these crops are being adopted at a rapid rate<sup>28</sup>.

Since China relaxed its import rules in 2004, the country has approved the use of genetically altered cotton and vegetables, including tomatoes and peppers<sup>29</sup>. Biotech rice traits have extreme potential for the region, as China is the largest producer of rice in the world (178 million tons of paddy). Since the Chinese government approvals of GM foods are providing the necessary momentum for broad GM adoption, Monsanto has proactively obtained a limited amount of patent rights on GM rice lines that are now being developed in China, and has gradually moved into the country as a

public supporter of China's biotech research. The company has recently established a \$1 million RMB scholarship to encourage biotech research at the Huazhong Agricultural University in China<sup>30</sup>. These incremental efforts to penetrate the Chinese market must be complimented with several production partnerships and aggressive marketing and lobbying.

The practical need for GM rice has been established by the International Service for the Acquisition of AgriBiotech Application (ISAAA) and has already estimated that 75 percent of China's rice supply is infested with the rice-borer pest, which GM rice varieties are able control. China's government also recognizes the benefits of the increased productivity and affordability that GM rice seeds would provide. China is aware of its need to maintain a self-sufficient increase in food supply in the face of harsh yield constraints (including drought, salinity, pests, and dropping water tables). The approval of the rice trait would benefit the 110 million rice-growing households that would be able to take advantage of this farming technology, while China's 1.3 billion rice consumers provide a significant market for expansion<sup>31</sup>. Nonetheless, China's ministry of Agriculture has only issued safety certificates for two biotech rice varieties in November 2009, which means that Monsanto still must wait for an official approval for its production and commercial use<sup>32</sup>. There are multiple Chinese Greenpeace and organic movement groups that are determined to represent Chinese residents that have been resisting the GMO movement in China. This has obstructed its path toward countrywide GM crop adoption.

Monsanto has struggled with anti-GMO, including anti-Monsanto groups, for 16 years, and has spent a significant amount of money to overcome the legal obstacles and approval delays caused by these groups. From a long-term perspective, as the global GMO debate moves away from the beliefs of these concentrated groups, their influence on government and public acceptance will continue to diminish. An aggressive entry into China, accomplished through supportive biotech partnerships and collaborative research initiatives, will help convert a large previously "undecided" portion of the global GMO debate. The company would also be able to achieve lower labor costs for regional production, which will become increasingly advantageous as

Monsanto expands into other Asian countries.

The company's management has already initiated a gradual move into China, but Vector Strategy Group strongly recommends that Monsanto aggressively increase their presence and work with various organizations to ease the public anxiety. Since China represents the world's largest potential consumer market, it is also essential for the industry to build upon the momentum of the government approvals. If the rice variety is approved, firms will compete in being the first to market and gaining the highest possible product penetration. This intensified competitive environment will favor whichever company is well positioned to partner with local distributors and suppliers. The firms that gain strong product traction will also be well positioned to be a market leader in the many Asian countries that are expected to follow China's lead<sup>33</sup>.

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## Endnotes

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