

# Executive Summary

The seed industry has quickly consolidated. The U.S. Department of Justice (DOJ) announced in August 2009 that it would investigate alleged anticompetitive conduct in the seed industry largely because a few dominant firms now control much of the seed supply.

Ten companies account for about two-thirds (65 percent) of the world's proprietary seed – that is, branded varieties subject to intellectual property protections – for major crops. Economists say that an industry has lost its competitive character when the concentration ratio of the top four firms (CR4) is 40 percent or higher. In seed, the top four firms account for 50 percent of the proprietary market alone, and 43 percent of the commercial market, which includes both proprietary and public varieties. This level of concentration has proven problematic, reducing choice and increasing prices for the average American farmer.

Several factors have contributed to concentration in the seed industry. Extensive concentration is a consequence of weak antitrust law enforcement and Supreme Court decisions that allowed agricultural biotechnology and other plant products to be patented. Together, these factors have created unprecedented ownership and control over plant genetic resources in major field crops.

Federal policy has also contributed to concentration. The 1980 Bayh-Dole Act allowed universities – for the first time – to patent inventions that result from publicly funded research projects on the theory that the law would increase innovation. With passage, industry funding of public research surged and public funding dropped dramatically. The result has been the privatization of public research, leading to restrictions on the free exchange of basic research, less public analysis of new varieties, and diminished innovation. Though industry funding of universities may not be something to criticize on its own, these trends are troubling.

Dozens of mergers and acquisitions followed the expansion of agricultural biotechnology. Many smaller companies could not compete with large firms that owned much of the genetic resource base in seed, and licensing genetics from these firms was costly. At least 200 independent seed companies have been lost in the last thirteen years alone. Furthermore, biotechnology research demands financial resources that most smaller, family-owned companies do not have. Large firms investing in these technologies and earning royalties from licensing agreements quickly achieved a market advantage that led to numerous buy-outs.

As smaller, independent companies vanish from the landscape, farmers see fewer options and higher prices in the marketplace. This report documents these trends in corn and soybeans using industry sources, government data, and personal interviews with farmers and seed industry representatives.

Discussions on seed industry concentration typically center on the dominant firm, the Monsanto Company, which achieved the No. 1 position in less than a decade by capturing the markets for corn, soybean, cotton, and vegetable seed. Its position is most evident when looking at acreage. Today, its genetically engineered (GE) traits are planted on more than 80 percent of U.S. corn acres and more than 90 percent of soybean acres.

Three major trends have emerged in the Monsanto-dominated seed marketplace that prove challenging to farmers.

## 1) Historic price increases in seed driven by royalty fees for GE traits

USDA figures show that the most substantial price increases occurred parallel to the rise in GE crop plantings, with the most significant price increases occurring within the last few years. Corn seed prices in 2009 were more than 30 percent higher, and soybean seed nearly 25 percent higher, than 2008 prices. These mark the steepest year-to-year increases to date.

Monsanto's dramatic price increases are unmatched. The company's traits and the technology (royalty) fees tied to them stand out as the driving force behind increased seed costs. These fees vary by crop type, but all have increased substantially over the years. The Roundup Ready trait in soybeans added \$6.50 per bag in 2000 and has nearly tripled since then, now costing \$17.50 per bag for the same trait – sometimes attributing to nearly half the price of a bag of Roundup Ready soybean seed.

## 2) The biotechnology industry's push for greater market penetration of stacked traits in corn

Higher seed prices have also resulted from Monsanto leveraging its market share to stack various traits into single varieties. In 2008, Monsanto executed an “expanded trait penetration” plan to increase sales of seed comprised of, or “stacked,” with three different traits. The strategy is aggressive and effective: First capture ample market share through attractive pricing structures and then increase prices once “penetration goals” are met. Because each trait fetches a separate royalty for Monsanto, as seed traits are stacked, prices grow.

## 3) Lack of conventional corn and soybean seed options

Monsanto also boosts triple-stack seed sales by effectively eliminating other options in the marketplace. As the industry consolidates, seed options narrow, and farmers lose access to important varieties they once relied on. Conventional (non-GE) options have diminished, and single and double trait corn varieties are also more difficult to locate. Farmers report that it is increasingly hard to find Bt corn without the Roundup Ready trait. Monsanto's data confirms this trend.

To drive farmers toward triple stack varieties, Monsanto implemented more dramatic price increases for single trait and double stack varieties while reducing single trait and conventional options in its own brands and subsidiary companies. Little attention has been given to this emerging trend, where demand does not factor in as much as a lack of choice.

To be sure, there is great demand among farmers for GE corn and soybeans. Yet demand for conventional varieties is growing at the same time that farmers are seeing these varieties slip away as the industry consolidates. Higher Roundup Ready soybean seed prices have sparked renewed interest in conventional soybeans. In 2009, numerous university extension agents reported that conventional soybean sales had doubled and demand could not be met. In fact, this year marked the first reduction of GE soybean acres since their introduction in 1996.

This report explores how the renewed demand for conventional soybeans is a result of various factors: high seed and glyphosate costs, glyphosate-resistant weeds, high premiums for conventional soybeans, and the ability to save non-patented varieties of conventional seed. Taken together, buying conventional soybean seed leads to cheaper production costs, access to more profitable markets, and the ability to save and improve seed.

All of these impacts to farmers are best understood by examining the role patent law has played in encouraging concentration. Over the course of decades, Congress has visited intellectual property protection for breeders of living organisms and consistently argued that sexually reproducing plants should not be awarded patents for fear of curtailing innovation, threatening the free exchange of genetic resources, and increasing market concentration. When Congress passed the 1970 Plant Variety Protection Act (PVPA) the law represented a compromise. It provides plant developers a temporary, legal protection of plants while exempting farmers and plant researchers.

But in 1980, the Patent and Trademark Office (PTO) awarded the first “utility” patent – patents for inventions – to a living organism. The Supreme Court upheld the PTO decision, holding that patent law is not specifically excluded in the PVPA but leaving the door open for Congress to make PVPA the exclusive protection for sexually reproducing plants.

Because patents remove a farmer’s right to save seed – an important form of competition – they have led to investigations of farmers for patent infringement (illegally saving patented seed) that at times infringe upon privacy and property rights.

Some of the concerns identified in this report are not new. They have been the focus of several antitrust cases targeting large firms. These cases provide valuable context and affirm this report’s findings. For example, *Texas Grain Inc. v. Monsanto Company* alleges that Monsanto’s licensing agreements with hundreds of seed companies restrain competition and future innovation by turning smaller seed companies into exclusive licensees of Monsanto products. Seed companies enter into these licensing agreements to access limited use of Monsanto’s technology, such as the Roundup Ready trait. The lawsuit points to financial disincentives for selling competitors’ products, which, if proven in court, means these businesses are essentially forced to maintain Monsanto’s market share or risk being financially penalized.

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We hope this report spurs the federal government, seed industry, and farmers to acknowledge and confront the issues resulting from a highly concentrated seed industry. The DOJ’s August 2009 announcement that it is inviting input on competition issues affecting U.S. agriculture – including industry concentration and issues relating to patents and intellectual property – is a necessary examination long overdue.

Our recommendations go beyond the examination of anti-competitive conduct in the seed industry, but they do start there. Our specific recommendations include:



- 1) **The Department of Justice should closely examine anticompetitive conduct in the industry.** Biotechnology firms have merged with or acquired a significant number of competitors, and though some have drawn antitrust scrutiny, no meaningful action has been taken to deal with anticompetitive players.
- 2) **Change patent law and establish Plant Variety Protection Act as sole protection.** By establishing the PVPA as the sole means of intellectual property protection over plants, farmers could regain the right to save seed and the right to choice, as plant breeders would have better access to plant genetics that are currently off limits to innovation because of patents.
- 3) **Change the Bayh-Dole Act (Patent and Trademark Law Amendments Act).** The Bayh-Dole Act as applied to seed patenting and agricultural innovations should be re-evaluated and reformed to prohibit mandates for seed patenting and exclusive licenses relating to technologies and innovations developed through publicly funded research.
- 4) **Rebuild public plant breeding and public cultivar development programs.** Now is the time for the USDA to make this major recommitment to reinvigorating our public breeding and public cultivar development programs so we can ensure that the needs of farmers and the general public are met and that research is conducted in an open and honest way.
- 5) **Remove the restriction on research from licensing agreements.** Independent research relies on access to protected products for purposes of innovation and information sharing. Patent owners should not have the power to prevent performance and safety testing of their products.
- 6) **Enact farmer contract reforms and establish a federal “Farmer Protection Act.”** Restoring fully the federal rights of farmers to negotiate fair contracts, and including explicitly the right of farmers to negotiate collectively, would greatly contribute to restoring a fair and open playing field and better ensure future competitive and transparent market behaviors.