Transgenic Seed Platforms: Competition Between a Rock and a Hard Place?

Addendum

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Executive Summary

Competitive and consumer concerns in the transgenic seed industry highlight the importance of pursuing a constructive public debate. In October 2009, the American Antitrust Institute (AAI) issued a White Paper titled *Transgenic Seed Platforms: Competition Between a Rock and a Hard Place* (AAI White Paper). This Addendum to the AAI White Paper furthers the discussion by focusing more closely on several issues that would likely arise in an antitrust inquiry into competitive problems in the industry. In the process, the Addendum responds to a number of flawed arguments contained in a Monsanto report (*Competition and Innovation in American Agriculture* (Monsanto Report)) that attempts to rebut the AAI White Paper. The Addendum also sets forth a policy agenda to promote generic competition.

The Addendum emphasizes that a discussion of vertical competitive issues must recognize Monsanto's monopoly in the upstream markets for genetic traits for herbicide tolerance (Ht) and insect resistance (Bt) in corn, soybeans, and cotton. An assessment of the structure of downstream markets for traited seed must also capture an accurate picture of what choices are available to farmers. This means attributing shares based on control, both for assets owned by Monsanto and its licensees. The Monsanto Report either sidesteps these issues or fails to address them effectively.

Monopolies in markets where intellectual property protection plays an important role can give rise to concerns over the potential use of patent rights to improperly control or influence competition. The tension between patent law and antitrust law is a central issue surrounding Monsanto's dominance in the markets for genetic traits. The Addendum concludes that Monsanto's review of currently available combinations of traits or "stacks" is not dispositive of harm to competition. Rather, an inquiry into what stacked combinations *could* have been developed--but were not because of restrictive or selective licensing--is necessary to answer this question. Recent price increases for transgenic seed also support the AAI White Paper's notion that farmers have more than likely been squeezed. The Monsanto Report's simplistic example that attempts to show farmers are not squeezed is easily disproved when a more realistic set of assumptions is used.

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Finally, the Addendum stresses the importance of moving forward with a policy agenda to address competition in generic competition. Such an agenda is needed immediately for Ht (Roundup Ready 1® (RR1®)) soybeans and will be required for other transgenic seed products that will come off-patent in the future. Given the small window available to jump-start generic competition in generic Ht soybeans, it is imperative to resolve these issues. Speedy resolution will give potential entrants more certainty that, in turn, will increase the probability of getting successful generic products to market so that farmers and ultimate consumers may benefit. It will also minimize market disruption that could have a broader, adverse impact on grain trade flows.

At this time, the AAI believes legislative remedies would prove too lengthy and unwieldy to promote generic competition. Other vehicles are needed to ensure: (1) development of an independent, third-party association to represent the interests of generic developers and users; (2) access to Monsanto RR1®data packages and/or access to RR1® itself in order to allow development of generic data packages to expeditiously obtain foreign registrations, with appropriate compensation to the patent-holder; (3) extension of Monsanto's foreign registrations for RR1® that would allow sufficient time to obtain registrations for generic products; and (4) removal of anti-stacking provisions in Monsanto's RR1® licenses for a period of time necessary to allow R&D to proceed at a pace that would bring generic products to market at the time the patent expires.

I. Introduction

On December 31, 2009, the American Antitrust Institute (AAI) submitted comments in "Agriculture and Antitrust Enforcement Issues in our 21st Century Economy," a forum initiated by the U.S. Department of Agriculture (USDA) and U.S. Department of Justice (DOJ). Those comments included the AAI White Paper titled *Transgenic Seed Platforms: Competition Between a Rock and a Hard Place* (AAI White Paper).[2] In the AAI White Paper, the AAI highlighted the importance of the agriculture industry, particularly the role of competition in promoting choice and quality and ensuring the safety, security, and diversity of the agricultural supply chain. The AAI White Paper examines competition in the transgenic seed industry, including trends in measures of innovation, the structure of markets for genetic traits and traited seed, and the tension between patent law and antitrust law.

The AAI White Paper suggested, in particular, that Monsanto is the dominant player in the market for genetic traits. It but did not conclude, however, that Monsanto has exercised its market power, to the detriment of competition and consumers.[3] There are very few independent, rival transgenic seed platforms comprised of technologies other than Monsanto's. Inter-platform competition is thus limited, giving farmers few choices of traited seeds that do not include Monsanto technologies. Likewise, the ability of rivals to obtain

[2] See Diana L. Moss, "Transgenic Seed Platforms: Competition Between a Rock and a Hard Place," (October 2009). Online at http://www.antitrustinstitute.org/archives/files/AAI_Platforms percent20and percent20Transgenic percent20Seed_102320091053.pdf.

[3] Information necessary to reach such a conclusion would likely be made available only in a confidential government investigation.

access to Monsanto's traits to combine with their own technologies also appears limited because of potentially restrictive or selective licensing. This impedes intra-platform competition. A central issue, therefore, is the potential use of patent rights to improperly control or influence competition.

In the USDA/DOJ comment forum, Monsanto submitted a response titled *Competition and Innovation in American Agriculture* (Monsanto Report), which attempts to rebut many of the ideas put forward in the AAI White Paper.[4] The Monsanto Report contains some useful data, including various combinations of genetic traits (i.e., stacks) currently available on the market. However, the Monsanto Report also contains numerous, significant flaws that limit its utility. In the interest of productively advancing the discussion of competition, this Addendum to the AAI White Paper pursues a number of issues that are central to an inquiry into competition concerns in the transgenic seed industry, including the development of generic competition. In the process, we will highlight and respond to a number of major flaws in the Monsanto Report.[5]

The Addendum is organized into several sections. The second section considers vertical competitive concerns regarding transgenic seed. The third section addresses the structure of markets for traits and traited seed in corn, soybean, and cotton, and questions surrounding innovation and past acquisitions. The fourth section examines arguments relating to potential competitive and consumer harm. The fifth section addresses the development of generic competition and the sixth section concludes.

II. Competitive Concerns

Competitive concerns in the transgenic seed industry are nothing new. The AAI White Paper presents statistics on both antitrust and patent litigation from 2002 to 2009, noting that Monsanto has been involved in a significant proportion of both.[6] Because innovation plays a central role in the transgenic seed industry, issues raised in patent infringement cases often overlap with antitrust concerns. On the antitrust side, private litigants have alleged harms ranging from anticompetitive agreements among competitors to monopolization, many of which revolve around the alleged use of patent rights to improperly control or influence competition. The AAI White Paper also notes the DOJ's settlements in Monsanto's acquisitions of DeKalb and Delta and Pine Land, which focused on Monsanto's patents and licensing policies.[7]

The AAI White Paper raises questions related to vertical competitive issues in transgenic seed. Such concerns revolve around Monsanto's potential ability and incentive to use its dominant market position in genetic traits to frustrate the ability of rivals to access technologies necessary to introduce new traited seed products. For example, the concept of "ability" goes to whether a firm(s) controls the inputs or infrastructure needed by rivals to produce products or services that can ultimately reach the consumer. This could include an electric transmission grid, a cable distribution system, or intellectual property such as

[4] See "Competition and Innovation in American Agriculture," (December 31, 2009). Online at http://www.monsanto.com/pdf/competition_innovation_in_american_agriculture.pdf.
[5] Our analysis is based on publicly available data and conversations with various market participants.
[6] *Supra* note 2, at 25.
[7] *Id*., at 28.

patented technologies. High market share in an upstream input market is one important indicator of a firm's ability to control critical resources. The question of "incentive" goes to whether it would be profitable for the firm to impede or cut off rivals' access to inputs.

We note that the Monsanto Report sidesteps any substantive analysis of the economic factors that underlie possible exclusionary conduct. Instead, the Monsanto Report falls back on a number of flawed arguments such as the theory of the "single monopoly rent."[8] The theory of the single monopoly rent says that the monopolist can earn at most one monopoly profit, regardless of whether it is vertically integrated. The theory, however, is well-known to hold only under a restrictive set of assumptions which do not apply in transgenic seed.[9] For example, the downstream markets for traited seeds are not perfectly competitive, and it is questionable that inputs are used in fixed proportions. Recent legal and economic research emphasizes the failure of the single monopoly rent theory.[10]

The Monsanto Report also attempts to argue that there is no evidence of foreclosure because of Monsanto's position in seed.[11] This statement focuses solely on the downstream market for traited seed, ignoring the important fact that an analysis of exclusionary conduct requires looking at other market as well, including those for genetic traits. By ignoring the upstream market for traited seed, the Monsanto Report thus glosses over Monsanto's monopoly in traits and its potentially negative implications for competition and consumers if it were to be maintained or extended to other related markets. It neither acknowledges the firm's high shares in Ht and Bt genetic traits in corn, soybeans, and cotton, nor disputes the AAI White Paper's estimates of those shares.

Finally, the Monsanto Report claims that economic theory predicts that Monsanto and other traits developers would have incentives to allow valuable stacks of traits.[12] This is because stacking allows Monsanto to meet demand for old and new traits, as well as to retain share for the older traits and avoid a loss of share for similar, rival new traits.[13] In a market not dominated by a single player, Monsanto's logic regarding stacking would make sense. But its dominance in genetic traits markets and the associated *de minimis* availability of substitutes minimizes any concern over losing share to rivals. Moreover, economic theory tells us that whether Monsanto has incentives to enforce its licenses in a discriminatory way (e.g., to prohibit or allow stacking) is determined by whether it is a profit maximizing strategy. Because the profitability of alternative licensing strategies has not been evaluated in the Monsanto Report, it is impossible to conclude (as does the Monsanto Report) that economic theory predicts that Monsanto has incentives to allow valuable stacks of traits. In sum, the Monsanto Report cannot effectively address competitive concerns--short of denying them altogether-- because it fails to acknowledge its monopoly in traits.

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[8] *Supra* note 4, at 44.

[9] For further discussion of the single monopoly rent, see, e.g., Michael H. Riordan and Steven C. Salop, "Evaluating Vertical Mergers: A Post-Chicago Approach," 63 *Antitrust L.J.* 513 (1994-1995), at 517.

[10] See, e.g., Einer Elhauge, "The Failed Resurrection of the Single Monopoly Profit Theory**,"** Harvard John M. Olin Discussion Paper Series Discussion Paper No. 664 (February 2010). Online at http://www.law.harvard.edu/faculty/elhauge/pdf/Elhauge_664.pdf.

[11] *Supra* note 4, at 45.

[12] *Supra* note 4, at 41.

[13] *Id.*, at 44.

III. Markets for Genetic Traits and Traited Seed

A. Market Structures

Much of the current public controversy over competition in transgenic seed centers on the structure of complementary markets in the supply chain. The AAI White Paper identifies these as markets for innovation, genetic traits, and traited seeds.[14] An analysis of competitive concerns in the transgenic seed industry would start with an assessment of these and other related markets (e.g., germplasm) in which Monsanto plays a role. As noted above, the Monsanto Report side-steps the question of market structure in genetic traits, namely Monsanto's high shares in genetic traits for Ht and Bt. Indeed, Monsanto's own documents, cited in the AAI White Paper, identify these shares as 97 percent for soybeans and 75 percent for corn.[15] Monsanto's share of cotton traits is about 95 percent.[16] They are—by any antitrust metric—market shares that would be considered monopolistic.

Instead of addressing the "elephant in the room" of Monsanto's dominance in genetic traits, the Monsanto Report devotes considerable attention to the markets for traited seed. It disagrees with the estimates of market shares for traited corn, soybeans, and cotton in the AAI White Paper, reported as "up to 65 percent" for corn and soybeans and 45 percent for cotton.[17] Monsanto states that its shares are only 29 percent for soybeans, 36 percent for corn, and 39 percent for cotton.[18] AAI obtained Monsanto's market shares for traited seed directly from Monsanto's June 2009 *Supplemental Toolkit for Investors*.[19] In that document, Monsanto aggregates shares of its seed business subsidiaries and its States Licensees programs. Those programs make Monsanto traits and/or germplasm available to Independent Seed Companies (ISCs) to produce branded seeds.[20]

For example, a line item titled "2008 corn market shares" reports a Monsanto share of 60 percent, comprised of DeKalb (25.5 percent), American Seeds Inc. (ASI) (10.5 percent), and Corn States Licensees (24 percent). Similarly, the document reports Monsanto's "2008 cotton market shares" totaling 45 percent, comprised of Deltapine (41 percent) and Cotton States Licensees (4 percent). Monsanto's "2008 soybean market shares" total 62.5 percent, made up of Asgrow (20 percent), ASI (9 percent), and Corn States Licensees (33.5 percent).[21] Despite this reporting in Monsanto's own documents, the Monsanto Report disputes the AAI White Paper's inclusion of shares under the States Licensees programs as part of Monsanto's shares. Including such shares, the Monsanto Report states, "...is a bit like

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[14] *Supra* note 2, at 8.
[15] *Id.*, at 13.
[16] *Id.* Cotton traits shares are based on USDA data, as discussed in the AAI White Paper.
[17] *Supra* note 2, at 13-14.
[18] *Supra* note 4, at 8-10.
[19] *Supra* note 2, at 14, note 32.
[20] See, e.g., K. Sauer, "What is Corn States?" (December 8, 2009). Online at http://www.monsanto.com/monsanto_today/2009/what_is_cornstates.asp.
[21] Note that the 2009 *Supplemental Toolkit for Investors* is no longer available on the Monsanto website. It has been replaced with the 2010 version of the same report, which states the firm's shares in corn as 53 percent, 44 percent for cotton, and 54.5 percent for soybeans. See *Supplemental Toolkit for Investors, Updated 2010*. Online at http://www.monsanto.com/pdf/investors/supplemental_toolkit.pdf.

attributing GM's market share to Toyota because GM sources some engines from Toyota."[22] Subtracting the State's Licensees shares from Monsanto's total shares in corn, soybeans, and cotton produces shares that are closer to what the Monsanto Report claims are accurate.

The Monsanto Report's quibble raises the question of whether Monsanto's traited seed shares should be measured on the basis of "manufacturing" or "brand." This is not an uncommon debate in antitrust analysis. If Monsanto has control over the pricing, marketing, and promotion of the ISC brands containing Monsanto traits under the States Licensees programs, then the higher shares reported in the AAI White Paper could well be accurate. If not--and absent any other compelling reason to attribute the States Licensees shares to Monsanto--then those shares should likely not be attributed to Monsanto. While this question cannot be fully answered on the basis of public information, reports indicate that Monsanto's licensing practices with regard to ISCs could impose the types of restrictions that would give it effective control over the States Licensees shares.[23]

B. Innovation, Acquisitions, and Market Structure

The transgenic seed industry has been characterized by changes in the pattern, quantity, and process of innovation and market structures for traited seed. The AAI White Paper identifies two major themes along these lines. One is whether Monsanto's numerous acquisitions of seed companies from the late-1990s through late 2000s have been a major determinant of increases in concentration in traited seed markets.[24] As noted in the AAI White Paper, the pattern and volume of consolidation (Monsanto's in particular) in the transgenic seed industry has generated much attention in the economic literature.

The Monsanto Report attempts to rebut the AAI White Paper's statement by a scattershot reporting of various firms' historical market shares in traited soybeans, corn, and cotton. It is impossible, however, to construct market concentration statistics—or derive conclusions about market concentration--from incomplete data on market shares. Moreover, the Monsanto Report relies on a proprietary dataset that shows changes in concentration in traited seed markets. Aside from the fact that the reader cannot evaluate the integrity, presentation, or interpretation of proprietary data, the Monsanto Report makes no effort to relate Monsanto's acquisitions to changes in the market concentration data it relies on.

Moreover, by focusing exclusively on market concentration in traited seed, the Monsanto Report again sidesteps the major competitive issue. For example, the Monsanto Report notes that: "The exchange of Stoneville for Delta and Pine Land increased Monsanto's share of cotton seed sold, but did not increase concentration."[25] While this is true, the Monsanto Report ignores the fact that the merger of Monsanto and Delta and Pine Land removed an ISC from the market, creating a large platform in cotton genetic traits and traited seed. While

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[22] *Supra* note 4, at 9.
[23] See e.g., Christopher Leonard, "Monsanto Squeezes out Seed Businesses Competition, AP Investigation Finds," (December 13, 2010). Available online at http://www.sott.net/articles/show/198898-Monsanto-Squeezes-Out-Seed-Business-Competitiors.
[24] *Supra* note 2, at 15. AAI White Paper also notes that other firms in the industry, including DuPont, Syngenta, and Dow, made acquisitions over the last 15 years. *Supra* note 2, at 14.
[25] *Supra* note 4, at 40.

vertical integration does not increase market concentration, it is important to note that the Monsanto Report ignores this aspect of the merger entirely.

A second theme noted in the AAI White Paper is the relationship between concentration and innovative activity in transgenic seed, which has also generated significant debate in the scholarly literature. The AAI White Paper reports on several indicators that could signal changes in innovative activity or its relationship to concentration, including patent grants, field releases, petitions for deregulation, changes in innovation quality, and industry "mobility."[26] Much of the Monsanto Report attempts to rebut the notion that there is a relationship between innovation and concentration.[27] But the Monsanto Report does little to support its counterclaim, citing little, if any, original analysis or scholarly research not already cited in the AAI White Paper. In the absence of any support, the reader is left to interpret the Monsanto Report as denying the findings of economic research performed by noted scholars in the field. Moreover, in its fervor to rebut almost every statement in the AAI White Paper regarding innovation in agriculture, the Monsanto Report either mis-states the AAI White Paper or highlights examples where there is, in fact, no disagreement. Many of these examples are not worth additional space but are illustrative of the how the Monsanto Report does little to advance a productive discussion regarding competition in transgenic seed.[28]

IV. Evidence of Harm to Competition and Consumers

A. Harm to Competition

As noted in the AAI White Paper, innovation has been the centerpiece of increased productivity in corn, soybeans, and cotton. Innovative activity is apparent in a number of basic measures, including patents and field releases, but also in the increasing complexity of traited seed products over a relatively short period of time. The AAI White Paper also stresses the importance of protecting innovation, stating that: "Patent protection allows innovators to reap the gains from their inventions. An inability to assert property rights over innovations would provide limited (if any) incentive for innovators to undertake risky investments in new technology, leading to underinvestment in R&D."[29]

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[26] *Supra* note 2, at 17-20.

[27] See, e.g., *supra* note 4, at 33.

[28] For example, the Monsanto Report asserts "...the AAI analysis of USDA field release data as a measure of innovation ignores the large declining trend in concentration." (*supra* note 4, at 15.) But even a cursory look at the AAI White Paper reveals a discussion that clearly recognizes declines in concentration. (*supra* note 2, at 17.) The Monsanto Report also takes issue with the AAI White Paper's discussion of downward trends in petitions for deregulation. But both the AAI data and the Monsanto data show such a trend. (*supra* note 2, at 19 and *supra* note 4, at 25, Exhibit 6.) Finally, the Monsanto Report claims: "The AAI paper's key argument for why action should be taken against Monsanto is based not on the level of its calculated market HHI (which is in a range where mergers are regulatory approved) but rather on the purported increase in the HHI over the last decade." (s*upra* note 4, at 14) This statement or conclusion does not appear anywhere in the AAI White Paper. After acknowledging that DuPont and Syngenta are also large patent-holders, and that we would expect to see less concentrated patent markets, the AAI White Paper states simply: "HHI concentration increased from the mid- to high 2,000s over the period." (s*upra* note 2, at 18).

[29] *Supra* note 2, at 5, note 8.

At the same time, there are, and ought to be, antitrust limits on the use of patents to constrain competition. Competitive issues in transgenic seed revolve primarily around the intersection between those rights and the protection of competition through antitrust enforcement. For example, conduct that results in monopoly profits on the basis of asserted patent rights outside the scope of a patent should be scrutinized by antitrust enforcers. DOJ Assistant Attorney General Christine Varney stressed this very concern in her remarks at the March 12, 2010 agriculture workshop in Ankeny, Iowa.[30]

Examples of anticompetitive conduct involving patents could include discriminatory licensing that improperly attempts to control or influence the development of innovation or competition in related markets. This includes enabling only those products that are perceived as beneficial to the patent-holder or locking out potential products that are perceived as a competitive threat. Put another way, antitrust enforcement should scrutinize decisions regarding *how to enforce* a patent in order to influence competitive developments in related markets. The more dominant a firm is in controlling critical patented inputs, the greater should be the potential scrutiny.

Unfortunately, the Monsanto Report misinterprets the AAI White Paper's discussion of the intersection between patent law and antitrust laws. For example, it asserts that "The fundamental message of the AAI paper is a call to gut the patent system as it applies to biotechnology."[31] The AAI White Paper sends no such message. At a more specific level, the Monsanto Report criticizes the AAI White Paper for not providing evidence that any stacked combination desired by growers is not available.[32] Presumably, this claim supports the idea that if there is no demand for any stacked products not already provided, Monsanto cannot be frustrating the development of alternative products.

Support for the Monsanto Report's claim that all the stacked trait products desired are available comes from a list based on proprietary data contained in Appendix 2. Stacked traits consist of combinations of more than one trait (e.g., an Ht trait and Bt trait, or multiples of such traits) that appear in traited seed. Plants from such seed express those characteristics. Despite the label "Stacked Traits in Corn, Soybeans, and Cotton," only 29 of the 45 items listed are actually stacks. The remainder are single traits, which are not relevant to the Monsanto Report's assertion that all *stacked* trait products desired by farmers are available. Of the 29 stacked trait combinations listed, Monsanto's traits are stacked with a non-Monsanto trait(s), or with another Monsanto trait(s) in 65 percent of the total. The stack data also reveal that Monsanto does not collaborate with DuPont or with Syngenta, with the exception of one Ht-Ht soybean stack with DuPont (RR-STS).

Monsanto's dominance in traited seed markets, coupled with the uneven landscape of trait combinations apparent in the Appendix 2 data emphasizes that the Monsanto Report asks

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[30] See, U.S. Department of Agriculture/U.S. Department of Justice, "Public Workshops Exploring Competition Issues in Agriculture," Transcript (March 12, 2010). In her remarks, Varney stated: "You know, patents have in the past been used to maintain or extend monopolies, and that's illegal, and you can be sure, Secretary, that we are going to be looking very closely at any attempt to maintain or extend a monopoly through an abuse of patent laws." (at 52). Online at http://www.justice.gov/atr/public/workshops/ag2010/iowa-agworkshop-transcript.pdf.

[31] *Supra* note 4, at 51.

[32] *Id.*, at 41.

the wrong question. The correct question is what stacked combinations *could* have made it through the R&D pipeline had competitors had access to Monsanto technologies, but did not because the company potentially chose to enforce its patents by disallowing stacking. This "but for" scenario would be a central part of any antitrust inquiry into the potential harm to competition. The Appendix 2 data, therefore, says nothing about the stacks that could have been valuable to farmers, were they enabled through licensing and ultimately brought to market as successful commercial products.

While this question can best be answered by information obtained in confidential disclosures, publicly available information indicates that Monsanto's licensing provisions have had the effect of preventing the development of seed products with stacked traits.[33] The AAI White Paper noted that "A single firm with control of an enormous stock of patented technology serves as gatekeeper for rivals seeking the access necessary for intra-platform competition. This gatekeeper role may extend far into the future, even if entry were to occur."[34] The Monsanto Report's failure to address the question of what stacked trait combinations could have been brought to market only punctuates the potential severity of Monsanto's gatekeeper role in constraining both competition and innovation.

B. Harm to Consumers

Recent price increases for transgenic seed have attracted significant attention in the media and sparked frustration in farmers over being squeezed by increasing input costs. To probe this issue, the AAI White Paper considers increases in seed costs over the last several years in relation to growth in the value of yields for corn, soybeans, and cotton. The analysis shows that the rate of increase in seed prices has outstripped growth in the value of yields. Without drawing any conclusions on the cause of these differential growth rates, the AAI White Paper suggests that market power in traits might be one possible cause.

Other data tell a similar story. For example, Figure 1 shows annual growth rates in real prices paid for biotech corn and soybean seed in the U.S. from 2002 to 2009.[35] Annual price increases for biotech corn and soybeans have trended upward over the last several years, with increases of 25 percent for soybeans, 28 percent for corn between 2008 and 2009. These price increases for corn and soybeans are similar to those reported by Monsanto for the same period.[36]

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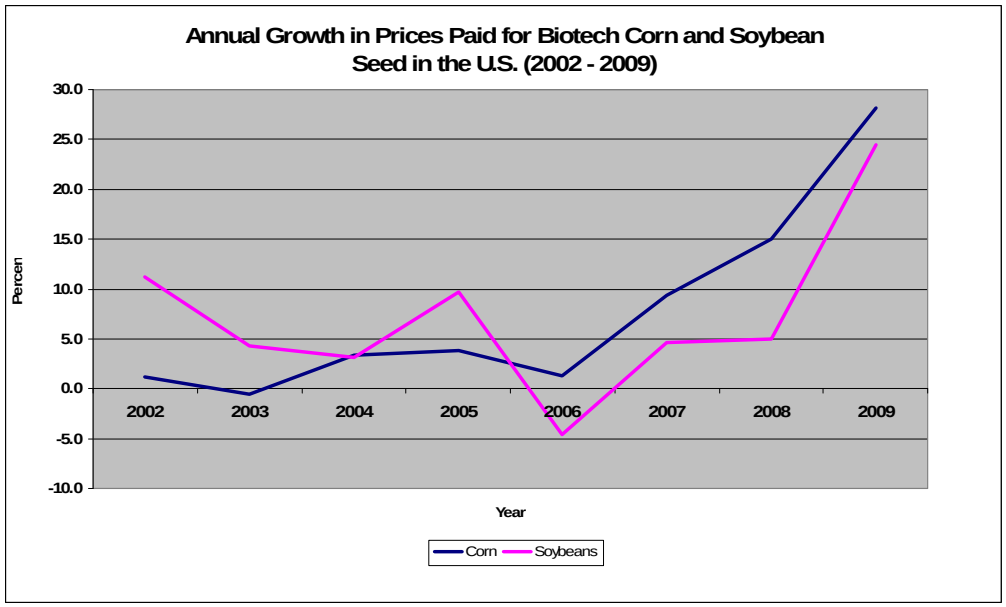
[33] *Supra* note 23.
[34] *Supra* note 2, at 19.
[35] The analysis in the October 2009 AAI White Paper notes that seed costs include traited and conventional seed. Thus, the USDA data in Figure 1 are a superior measure since they are specific to biotech crops. Cotton seed prices are not included because of incomplete data. Growth rates are derived from USDA-NASS data queried online at http://www.nass.usda.gov/Data_and_Statistics/Quick_Stats/index.asp.
[36] *Supra* note 23.

Figure 1



The Monsanto Report critiques the AAI White Paper's analysis of prices and yield values by attempting to show that even if seed costs increase at a faster rate than yield values, farmers can still profit.[37] This conclusion holds up only in the Monsanto Report's simplistic two-period example, not in a more realistic, multi-year one. The Monsanto Report's example assumes growth rates of 5 percent, 10 percent, and 0 percent per year in revenues, seed costs, and non-seed costs, respectively. If we change any of these assumptions (individually or together), farmer profits either remain constant or disappear in a relatively short time. Any of these scenarios punctuates the potential problem of large increases in seed input prices and the squeeze they could impose on farmers.

Table 1 contains four examples that extend the Monsanto Report's two-period model to eight periods. The first presents the base case contained in the Monsanto Report, the second assumes non-seed costs increase at 5 percent per year, the third assumes that seed costs increase at 25 percent per year, and the fourth assumes that both non-seed costs and seed costs increase at 5 percent and 25 percent per year, respectively. These changed assumptions are not unreasonable. For example, non-seed costs cannot be expected to remain flat over time, as the Monsanto Report assumes. And public statements by a Monsanto spokesperson indicate that corn seed prices increased by 25 percent and soybeans increased by 28 percent last year—values similar to what the USDA data show.[38]

In the first, Monsanto Report example, profits would grow, on average, at about 14 percent per year. A small change in the non-seed cost growth assumption, however, reduces this average annual growth to about 2 percent per year. In the third example, an increase in the growth rate in seed costs also reduces average annual growth in profits to about 2 percent per year, with profit growth falling to zero in Year 6. In the fourth case, when both non-seed

[37] *Supra* note 4, at 49.
[38] *Supra* note 23.

and seed costs assumption are changed from the Monsanto Report's base case, average annual growth in profits is about -7.4 percent, and profit growth is negative in all years. None of these scenarios—except the Monsanto Report's unrealistic one--would look particularly attractive to a farmer. Moreover, it is not clear if the proportions of seed and non-seed costs used in the Monsanto Report example are accurate. If they are not, then the results of the profit example could change even further.

Table 1
Monsanto Report's Flawed Profit Example
Example 1: Monsanto Report Assumptions
Growth in Non-seed Cost (0 percent), Seed Cost (10 percent), and Revenue (5 percent)

Component ($)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Gross Revenue	100	105	110	116	122	128	134	141
Non-Seed Cost	70	70	70	70	70	70	70	70
Seed Cost	10	11	12	13	15	16	18	19
Total Cost	80	81	82	83	85	86	88	89
Net profit	20	24	28	32	37	42	46	51

Example 2: Different Non-seed Cost Assumptions
Growth in Non-seed Cost (5 percent), Seed Cost (10 percent), and Revenue (5 percent)

Component ($)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Gross Revenue	100	105	110	116	122	128	134	141
Non-Seed Cost	70	74	77	81	85	89	94	98
Seed Cost	10	11	12	13	15	16	18	19
Total Cost	80	85	89	94	100	105	112	118
Net profit	20	21	21	21	22	22	22	23

Example 3: Different Seed Cost Assumption
Growth in Non-seed Cost (0 percent), Seed Cost (25 percent), and Revenue (5 percent)

Component ($)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Gross Revenue	100	105	110	116	122	128	134	141
Non-Seed Cost	70	70	70	70	70	70	70	70
Seed Cost	10	13	16	20	24	31	38	48
Total Cost	80	83	86	90	94	101	108	118
Net profit	20	23	25	26	27	27	26	23

Example 4: Different Non-seed Cost and Seed Cost Assumptions
Growth in Non-seed Cost (5 percent), Seed Cost (25 percent), and Revenue (5 percent)

Component ($)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Gross Revenue	100	105	110	116	122	128	134	141
Non-Seed Cost	70	74	77	81	85	89	94	98
Seed Cost	10	13	16	20	24	31	38	48
Total Cost	80	86	93	101	109	120	132	146
Net profit	20	19	17	15	12	8	2	-5

The Monsanto Report's failure to show that price increases in transgenic seed should not raise concern is accompanied by a number of arguments as to why high prices are justified. For example, the Monsanto Report concludes that: "If biotech traits did not benefit growers, they would not pay the price premium charged for seed with these traits."[39] This statement again exposes the Monsanto Report's repeated side-stepping of the problem of Monsanto's dominance in traits. Namely, growers may not have the ability to avoid high premiums (regardless of the benefits) because there are so few substitutes. Any firm can argue that if its product was not in demand, people would not pay for it but the point is that a monopolist has the luxury to set its price at whatever level maximizes profits.

In a related vein, the Monsanto Report asserts that prices for products that have a high innovative component may remain high because of the necessity of recouping R&D costs.[40] Presumably, this assertion challenges the AAI White Paper's statement that over time, competitive pressures should lower prices. The AAI White Paper states, for example that "…in competitive markets, technologies that enjoy widespread and rapid adoption typically experience precipitous declines in cost as innovators learn-by-doing and competitive pressures drive prices down."[41] Unfortunately, the Monsanto Report mis-states the AAI White Paper when it claims "...if companies like Monsanto set price equal to marginal cost (as AAI Suggests) it would not allow them to recoup their cost..."[42] The AAI White Paper makes no such statement regarding price and marginal cost.

V. Generic Competition

Monsanto's RR1®soybeans will come off-patent in 2014, opening the door to the development of a generic Ht soybean trait. If managed properly, this transition could stimulate competition in both a generic Ht trait and alternative stacked products containing a generic Ht trait. That competition, in turn, would deliver benefits to farmers in the form of innovation, lower prices, and choice. Industry stakeholders have recognized the urgency associated with planning for a smooth transition to competition in a generic Ht trait.[43] This process should ideally focus on two objectives: (1) developing an institutional structure for promoting and managing generic competition and (2) working with the patent-holder (Monsanto) to facilitate development of generic products.

The overriding concern behind this two-pronged strategy is to promote certainty for generic entrants in securing an ultimate path to market successful products. Certainty is necessary for developers to undertake investments in R&D and will be enhanced if the transition minimizes the possibility of a "gap" between the time RR1® goes off-patent and when products containing a generic Ht trait enter the market. Such a gap could potentially jeopardize the development of competition in generic products. This is because a next generation product has already been introduced (e.g., Monsanto's RR2® soybeans). If decisions at both the R&D and farmer levels cannot be easily reversed, a lock-in effect could stymie switching to generic Ht.

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[39] *Supra* note 4, at 51.
[40] *Id.,* at 49.
[41] *Supra* note 2, at 9.
[42] *Supra* note 4, at 50.
[43] See, e.g., American Farm Bureau Federation, letter from Bob Stallman dated February 25, 2010.

The potential development of generic transgenic traits shares a major feature with generic pharmaceuticals, namely they both require longer lead times to develop and bring new products to market. This includes development, testing, and securing necessary regulatory approvals. The implication of a longer pipeline to market is that developers require advance access to the existing patented RR1® trait to test and breed out new stacked traited products. While Monsanto has recently committed to not enforce patents against farmers (e.g., in regard to seed-saving), the company has been silent on the matter of whether it will enforce patents against developers who wish to stack the RR1® trait with their own traits for the purposes of developing products containing a generic Ht trait.[44] Non-enforcement of seed saving provisions in farmer licenses does nothing to promote the development of a generic product or products containing an Ht trait.

The practical implication of an asymmetric policy on patent enforcement is that developers could not start R&D until patent expiry in 2014. It could thus be another several years before a generic product(s) could be brought to market. On the pharmaceutical side, the Hatch-Waxman Act makes provisions to facilitate generic entry by creating a window in which there is a hiatus on patent-infringement claims. While a Hatch-Waxman-type approach on the transgenic seed side may be a potentially useful longer-term strategy, a legislative solution for current transition issues would be time consuming and unwieldy. A more expeditious method is needed for transgenic seed.

The importance of the transition process in generic seed is punctuated by the fact that there is a significant export market for U.S. seeds. Many foreign authorities require that individual traits and stacks of traits gain necessary approvals (registrations) before they can be imported. The foreign registration process requires testing and reliance on data packages to support the application. Monsanto has committed to maintaining foreign registrations for RR1®soybeans for a period of three years post-patent expiry.[45] While this is a move in the right direction, three years is unlikely to be sufficient time to allow generic developers to develop their own data packages to support foreign registrations before the Monsanto registrations expire.

A gap between expiration of Monsanto's foreign registrations for RR1®and when generics come on to the market would create perilous uncertainty and put competition in jeopardy. Developers are unlikely to undertake R&D for generic products without the certainty that the foreign registration process will be uninterrupted. A gap could also create chaos in the export and domestic markets. Because grain shipments destined for the export market and the domestic markets are not segregated, any uncertainty regarding the destiny of shipments to foreign markets will also affect domestic production decisions. Both of these possibilities would be costly outcomes, in terms of disrupting the development of generic competition and ultimately in higher prices and less choice for farmers.

A policy agenda for the transition to a generic Ht soybean platform is needed. At a minimum, that agenda should ideally address the following issues: (1) development of an

[44] See "Roundup Ready® Soybean Patent Expiration," (undated). Online at http://www.monsanto.com/choice_in_agriculture/seed_competition/patent_expiration.asp/.
[45] *Supra* note 44.

independent, third-party association to represent the interests of generic developers and users; (2) access to Monsanto RR1® data packages and/or access to RR1®itself in order to allow development of generic data packages to expeditiously obtain foreign registrations, with appropriate compensation to the patent-holder; (3) extension of Monsanto's foreign registrations for RR1® that would allow sufficient time to obtain registrations for generic products; and (4) removal of anti-stacking provisions in Monsanto's RR1® licenses for a period of time necessary to allow R&D to proceed at a pace that would bring generic products to market at the time the patent expires.

VI. Conclusion

A constructive debate on competition in transgenic seed is a high priority for policy makers and antitrust enforcers alike.[46] The Addendum to the October 2009 White Paper contributes to this discussion by setting out major questions that would likely arise in an antitrust inquiry into vertical competitive concerns and responding to a number of flawed arguments in the Monsanto Report.

The Addendum emphasizes that any discussion of vertical issues must recognize Monsanto's monopolies in genetic traits for corn, soybeans, and cotton. An accurate picture of the structure of downstream markets for traited seed is also needed. Monsanto either sidesteps these issues or addresses them inadequately. Monsanto's dominance in upstream traits markets raises the potential concern of using patent rights to improperly control or influence competition. Moreover, strong price increases in transgenic seed support the AAI White Paper's notion that farmers have more than likely been squeezed. Again, the Monsanto Report's attempts to rebut these arguments fall short.

The Addendum also stresses the importance of moving forward with a policy agenda to address generic competition. Given the short time frame involved, it is imperative to create certainty for potential generic entrants in seeking a path to market for potentially successful products and to minimize market disruption that could have a broader, adverse impact on grain trade flows.

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[46] Monsanto asserts incorrectly that the AAI White Paper was "sponsored" by DuPont. (*supra* note 4, at 52, note 233.) In the interest of veracity, AAI responds accordingly to this misinformation. The AAI is an independent, not-for profit (503(c)) corporation based in Washington, D.C. AAI's mission is to promote fair competition and consumer protection. This mission is fulfilled through a variety of activities. Over the last decade, AAI has offered analysis and opinion on a variety of issues that raise significant competition policy questions and concerns across a wide range of industries. AAI activities and analyses include amicus briefs, White Papers, scholarly articles, workshops, conferences, media contact, and public speaking appearances. AAI is funded by a variety of sources. All contributions are made to the general treasury and a list of our donors (over 150 have contributed at least $1,000) is always available upon request. We do not have clients. Much like any other non-profit organization, contributions to AAI reflect support for our core mission. Our internal decision-making process is intended to ensure that projects undertaken meet these criteria. AAI's Board of Directors approves all major work projects and publications. Given these processes, it would be infeasible for AAI to take a position as a *quid pro quo* for a contribution. Moreover, AAI has often undertaken projects and become involved in issues in which no contributor has a direct or even indirect interest. If we were to take positions that are out of synch with what AAI has consistently stood for, our hundred-plus Advisory Board would likely react negatively and resign. We have stated openly that DuPont is a contributor to the AAI. We have received information from DuPont as well as others knowledgeable about the industry. DuPont has not, however, sponsored, directed, controlled, vetoed, or otherwise interfered with our independence in the course of the preparation of our White Paper or this Addendum.