

OWNING ALL THE SEEDS: CONSOLIDATION AND CONTROL IN AGBIOTECH

BY

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“For the public and nature such mergers are marriages made in hell”¹

I. INTRODUCTION

What if one company owned all the seeds for all the food crops planted around the world—all the corn, all the soy, all the wheat, all the rice—all owned by one corporation? What if that same company also owned all the fertilizer and all the pesticides? Would it matter? Would that kind of consolidation make food security more or less likely? What if it were two corporations instead of one? What if it were four companies instead of one? We are about to find out.

In the space of roughly one year, the so-called “big six” agbiotech companies² announced three mega-mergers. First, in December 2015, Dow and DuPont announced a ‘merger of equals’ combining the two United States-based chemical firms into a new \$130 billion company.³ Less than two months later, in February 2016, Basel-based Syngenta announced that it had agreed to be purchased by the Chinese National Chemical Corporation (ChemChina) for \$43 billion.⁴ Syngenta made the ChemChina agreement after fending off repeated purchase offers from

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¹ Foo Yun Chee, *Asset Sales Plan Secures EU backing for \$130 bln Dow, DuPont merger*, REUTERS (March 27, 2017) <http://www.reuters.com/article/us-du-pont-m-a-dow-eu-idUSKBN16Y16O> (quoting Adrian Bebb, Friends of the Earth Europe.)

² Civil society groups have coined the term “the Big Six” to refer to Dow, DuPont, Bayer, Monsanto, Syngenta and BASF. See e.g., *Big Six Pesticide and GMO Corporations*, SourceWatch <http://www.sourcewatch.org/index.php/%22Big+6%22+Pesticide+and+GMO+Corporations>; Hope Shand, *The Big Six: A Profile of Corporate Power in Seeds, Agrochemicals, and Biotech*, SeedSavers (2012) http://www.seedsavers.org/site/pdf/HeritageFarmCompanion_BigSix.pdf. The term has been picked up by the popular press.

³ Press Release: *DuPont and Dow to Combine in Merger of Equals* (December 11, 2015) <http://www.dow.com/en-us/news/press-releases/dupont-and-dow-to-combine-in-merger-of-equals>.

⁴ *ChemChina Cash Offer to Acquire Syngenta at a Value of Over US\$43 Billion*, PR Newswire (February 3, 2016) <http://www.prnewswire.com/news-releases/chemchina-cash-offer-to-acquire-syngenta-at-a-value-of-over-us-43-billion-300214306.html>.

Monsanto.⁵ Then, in mid-September 2016, Monsanto announced its own deal—the company had accepted a \$66 billion merger proposal from Bayer.⁶ When the dust settles, the world will be left with four extremely large ag-biotech companies: Dow/Dupont, ChemChina/Syngenta, Monsanto/Bayer, and BASF. As the lone non-merging company, BASF is the most likely purchaser of any agricultural units the other companies are forced to spin off in order to obtain regulatory approval for their proposed mergers.⁷

The primary justifications advanced for these mergers are efficiency and enhanced shareholder value. Dow and DuPont, in particular focused largely on the relatively prosaic business justifications of “synergies,” and “strong industrial logic”⁸ for their merger. However, the other companies were not above suggesting that these mergers were necessary to feed a growing global population. For example, Bayer CEO Werner Bauman characterized his company’s proposed merger with Monsanto as “the kind of revolutionary approach to agriculture that will be necessary to sustainably feed the world....”⁹ Similarly, Monsanto’s press release announcing the merger described it as responsive to “one of the greatest challenges of our time: how to feed an additional 3 billion people in the world by 2050 in an environmentally sustainable way.”¹⁰ The media conference call announcing the Bayer-Monsanto merger explicitly linked the merger to food security, describing the combined company as “benefitting from macro trends”

⁵ Alison Rice, Syngenta, *Monsanto in Merger Standoff*, AGWEB (June 24, 2015) <http://www.agweb.com/article/syngenta-monsanto-in-merger-standoff-naa-alison-rice/>. Monsanto apparently wanted Syngenta pretty badly—making three take-over offers over the course of four years. Jack Kaskey, *Monsanto to Focus on Technology as Syngenta Slips Away*, BLOOMBERG (February 3, 2016).

⁶ *Bayer and Monsanto to Create a Global Leader in Agriculture* (September 14, 2016) <http://news.monsanto.com/Bayer-Monsanto-acquisition>.

⁷ *Bayer Monsanto Start \$2.5 Bln Asset Sale to Get Merger Clearance—Sources*, REUTERS (March 9, 2017) <http://af.reuters.com/article/energyOilNews/idAFL5N1GM398>. Syngenta has also expressed an interest in any seed assets that the other companies are forced to divest. *SpinOff Opportunities About Amid Ag’s Meger/Acquisitions*, BLOOMBERG (March 29, 2017) <http://www.agprofessional.com/resource-centers/crop-protection/spinoff-opportunities-abound-amid-ags-mergersacquisitions>

⁸ Investor Presentation: *Dow DuPont Merger of Equals Update*, 15-16 (June 16, 2016) <http://www.dowdupontunlockingvalue.com/for-shareholders#faqs>.

⁹ Press Release: Media Conference Call Address by Werner Baumann 6-7 (May 23, 2016) [http://www.presse.bayer.de/baynews/baynews.nsf/id/8F5DEC7CA456C399C1257FBB007519F6/\\$File/Speech%20\(2016-1504e\).pdf?open&mod=30.08.2016_11:18:59](http://www.presse.bayer.de/baynews/baynews.nsf/id/8F5DEC7CA456C399C1257FBB007519F6/$File/Speech%20(2016-1504e).pdf?open&mod=30.08.2016_11:18:59)

¹⁰ *Bayer and Monsanto to Create a Global Leader in Agriculture* (September 14, 2016) <http://news.monsanto.com/Bayer-Monsanto-acquisition>.

including rapid population growth, and “biophysical effects of climate change shocks on yield.”¹¹ One Monsanto spokesman took this save-the-world rhetoric up a notch, commenting “I find it difficult to see how an acquisition of a company whose seeds help feed the world by a company whose products help keep us all healthy longer could be anything less than saintly.”¹²

Striking a similar note, ChemChina described its merger with Syngenta as “not confined to our mutual interests” but also as a way to “respond to and maximize the interests of farmers and consumers around the world” and “to deliver safe and reliable solutions for the continued growth in global food demand.”¹³ This framing seeks to advance a narrative of social necessity—that feeding the world in an era of climate change requires the products these companies produce, and the level of consolidation these companies represent.

But this ‘our products will save the world’ narrative is characterized by some as a myth.¹⁴ There is another narrative emerging—one that places the kind of industrial agriculture these companies represent squarely on the problem side of the ledger, rather than on the solution side. In this alternative narrative, the type of industrial-scale monoculture that these companies supply helps to drive climate change rather than combat it, and stands as an obstacle to food security rather than as its mainstay. Glimmers of this alternative narrative are increasingly common in official reports. For example, one major international report recently characterized the extravagant, save-the-world-esque claims made for the genetically-engineered crops these companies produce as “unproven.”¹⁵ The United Nations Conference on Trade and Development

¹¹ SEC, Monsanto Schedule 14 A, Media Conference Call (September 14, 2016) at 7 <https://www.sec.gov/Archives/edgar/data/1110783/000119312516712356/d243622ddefa14a.htm>.

¹² Aoife White, Bayer, Monsanto Must Overcome Incredibly Hulk, Regulators, Bloomberg (August 23, 2016) <https://www.bloomberg.com/news/articles/2016-08-23/bayer-must-overcome-incredible-hulk-regulators-in-monsanto-bid>.

¹³ ChemChina Cash Offer to Acquire Syngenta at a Value of Over US\$43 Billion, PR Newswire (February 3, 2016) <http://www.prnewswire.com/news-releases/chemchina-cash-offer-to-acquire-syngenta-at-a-value-of-over-us-43-billion-300214306.html>.

¹⁴ ETC Group, *Putting the Cartel Before the Horse...and Farm, Seeds, Peasants, etc.*, 4 (September 2013) <http://www.etcgroup.org/sites/www.etcgroup.org/files/CartelBeforeHorse11Sep2013.pdf> (making the case that small holder farmers, using traditional methods not only feed most of the world, but also represent the best hope to continue to do so in an era of climate change).

¹⁵ International Assessment of Agricultural Knowledge, Science and Technology for Development [IIASTD], AGRICULTURE AT A CROSSROADS. SYNTHESIS REPORT: A SYNTHESIS OF THE GLOBAL AND SUB-GLOBAL IIASTD

expressed concern that “concentration in agricultural biotechnology is giving the largest corporations unprecedented power vis-à-vis growers and other stakeholders” with “far-reaching implications for food security.”¹⁶ Similarly, the Food and Agriculture Organization recently noted that successful development of the more compelling advances claimed by technology touted by these companies has “been anticipated several times . . . [but] has had very limited impact so far.”¹⁷ Writing specifically about pesticide use, Olivier de Schutter, the UN Special Rapporteur on the Right to Food, recently lambasted the very products these companies are touting as “solutions” on the ground that pesticides are “undermin[ing] the right to adequate food and health for present and future generations.”¹⁸ Indeed the Special Rapporteur cautioned that the model of agriculture these companies represent “is highly problematic, not only because of damage inflicted by pesticides but also their effects on climate change, loss of biodiversity and inability to ensure food sovereignty.”¹⁹ He described the industry as an oligopoly with enormous power, and highlighted the conflict of interest in allowing the same handful of companies to dominate global seed and pesticide sales.²⁰

This competing agricultural narrative adds a compelling social justice edge to the ongoing antitrust examination of these mergers. The United Nations Conference on Trade and Development expressed a concern that “concentration in agricultural biotechnology is giving the largest corporations unprecedented power vis-à-vis growers and other stakeholders.”²¹ This concentration of the agricultural input market “has far-reaching implications for global food

REPORTS *at* 8 (2009), [http://www.unep.org/dewa/agassessment/reports/IAASTD/EN/Agriculture%20at%20a%20Crossroads_Synthesis%20Report%20\(English\).pdf](http://www.unep.org/dewa/agassessment/reports/IAASTD/EN/Agriculture%20at%20a%20Crossroads_Synthesis%20Report%20(English).pdf); see also, E. Toby Kiers et al., *Agriculture at a Crossroads*, 320 SCIENCE 320 (April 18, 2008) (explaining the Report conclusions).

¹⁶ Olivier Matringe and Irene Musselli Moretti, United Nations Conference on Trade and Development (UNCTAD), *Tracking the Trend Towards Market Concentration: The Case of the Agricultural Input Industry*, (April 20, 2006).

¹⁷ HUGH TURRAL, JACOB BURKE AND JEAN-MARC FAURÈS, FOOD AND AGRICULTURE ORGANIZATION, CLIMATE CHANGE, WATER, AND FOOD SECURITY xxiii (2011), <http://www.fao.org/3/a-i2096e.pdf>.

¹⁸ Human Rights Council, *Report of the Special Rapporteur on the Right to Food* ¶2, A/HCR/34/48 (January 24, 2017).

¹⁹ *Id.* at ¶105.

²⁰ *Id.* at ¶86.

²¹ Olivier Matringe and Irene Musselli Moretti, United Nations Conference on Trade and Development (UNCTAD), *Tracking the Trend Towards Market Concentration: The Case of the Agricultural Input Industry*, (April 20, 2006).

security, as the privatization and patenting of agricultural innovation (gene traits, transformation technologies and seed germplasm) has been supplanting traditional agricultural understandings of seed, farmers' rights, and breeders' rights." Yet, most of these weighty questions will not be directly on the table in the myriad reviews these mergers will face. There will be no wide-ranging inquiry into the public's interest that would encompass environmental sustainability concerns and food security issues, despite the urgency of those questions.

Regulators deciding whether to approve these mergers have a relatively narrow purview. The Clayton Act requires that regulators focus exclusively on whether the effect of the mergers "may be substantially to lessen competition, or to tend to create a monopoly."²² In other words, the focus of the antitrust regulator is on making sure that "[m]ergers should not be permitted to create, enhance, or entrench market power or to facilitate its exercise."²³ As a result, regulatory analysis of these mergers will focus on arcane calculations of market concentration. While wading through technical analyses of HHI²⁴ and SSNIP²⁵ and CRs²⁶ that make up an antitrust assessment, it can be easy to lose sight of what is at stake—whether three or four companies

²² 15 U.S.C. § 18. Section 7 of the Clayton Act prohibits mergers if "in any line of commerce or in any activity affecting commerce in any section of the country, the effect of such acquisition may be substantially to lessen competition, or to tend to create a monopoly."

²³ DOJ Merger Guidelines *supra* n. 24 at 2.

²⁴ The Herfindahl-Hirschman Indexes (HHI) is a commonly accepted measure of market concentration. HHI is calculated by summing the squares of the individual firms' market shares, and thus gives proportionately greater weight to the larger market shares. When using the HHI, the DOJ and other regulatory agencies consider both the post-merger level of the HHI and the increase in the HHI resulting from the merger. Based on their experience, markets are generally classified into three types: 1) Unconcentrated Markets: HHI below 1500; 2) Moderately Concentrated Markets: HHI between 1500 and 2500; and 3) Highly Concentrated Markets: HHI above 2500. U.S. Dep't of Justice & Fed. Trade Comm'n, *Horizontal Merger Guidelines* 18-19 (2010), <https://www.justice.gov/sites/default/files/atr/legacy/2010/08/19/hmg-2010.pdf>. According to the American Antitrust Institute, the pre- to post-merger increase in concentration in corn seed for the Dow/DuPont merger will be over 400 HHI points, producing a post-merger concentration of over 3,000 HHI, for soybeans it will be a 350 HHI point increase, for a post-merger level of about 2,700 HHI. The Monsanto-Bayer merger would produce a 1600 HHI point increase in concentration in the cotton seed market, for a post-merger level of about 3,750 HHI. BEFORE THE SENATE JUDICIARY COMMITTEE "CONSOLIDATION AND COMPETITION IN THE U.S. SEED AND AGROCHEMICAL INDUSTRY" TESTIMONY OF DIANA L. MOSS, PH.D. PRESIDENT, AMERICAN ANTITRUST INSTITUTE (SEPTEMBER 20, 2016) <https://www.judiciary.senate.gov/imo/media/doc/09-20-16%20Moss%20Testimony.pdf>

²⁵ SSNIP stands for "a small but significant and non-transitory increase in price" is a methodological tool for identifying the relevant products and market to be used to test post-merger market power. *Id.* at 8-9.

²⁶ CR stands for concentration ratio. CRs are used to demonstrate market control and to identify oligopolies.

should be permitted to control the global agriculture, and to determine the priorities and direction of agricultural research.

Yet, even for the questions that are central to antitrust laws—the impacts on competition and innovation—the answers seem troubling. In general, when four firms control 50% or more of a market, that market is no longer considered competitive.²⁷ By that matrix, seed markets in the United States are already not competitive. In 2014-15, the share of seed sales in the United States controlled by the four largest firms had was 91% for cotton, 82% for corn, and 76% for soybeans.²⁸ The numbers are not much better on the global scale. A combined Bayer/Monsanto would single-handedly controlling 29% of the world's seeds and 24% of its pesticides.²⁹ This level of concentration creates real concerns about the effects these mergers will have on farmers, and on those of us who choose to eat food. Among the concerns are the possibility of price increases and loss of choice, both for farmers and consumers, as well as the ramifications of increasingly consolidated control over the production of agricultural knowledge.³⁰

This Article will consider each of these concerns in turn. Part II offers a general background on the rise of genetically-modified crops and the accompanying consolidation in the agricultural industry. Part III then describes the three merger proposals, surfacing some of the key regulatory concerns. Part IV draws on past experience with agricultural mergers to

²⁷ See e.g., Fredrick M. Scherer and David Ross, *Industrial Market Structure and Economic Performance* 3d. Ed. (1990)

²⁸ Texas A&M Food Policy Center, *Effects of Proposed Mergers And Acquisitions Among Biotechnology Firms on Seed Prices 1*(September 2016) https://www.afpc.tamu.edu/pubs/0/675/WP_16-2.pdf. For perspective, in 1998, the four-firm concentration ratio was 67% for corn seed, 49% for soybean seed, and 87% for cotton seed. Statement of Keith Collins, Chief Economist US Department of Agriculture, Before the US Senate Committee on Appropriations Subcommittee on Agriculture, Rural Development and Related Agencies (May 17, 2001) <https://www.usda.gov/oce/newsroom/archives/testimony/2005-1997files/051701co.html>

²⁹ Brad Plummer, *Why Bayer's Massive Deal to Buy Monsanto Is So Worrisome*, Vox (September 15, 2016) <http://www.vox.com/2016/9/14/12916344/monsanto-bayer-merger>.

³⁰ This is not an exhaustive list of the range of concerns raised by these mergers. There are real concerns about the effect these mergers will have on food security, sustainability, and biodiversity. Sadly, these questions are not even on the radar screen of the antitrust regulators who will approve or reject the mergers. I have written elsewhere about the role that genetically-engineered crops, and pesticides play in food security and environmental sustainability. Rebecca Bratspies, *Hunger and Equity in an Era of Genetic Engineering*, 7 *U.C. Irvine L. Rev.* 7 (2017); *Food, Hunger and Technology*, 19 *L. Culture and Humanities* 212 (2014). This Article will focus on the competition and innovation concerns within the purview of antitrust regulators.

demonstrate how these mergers will negatively impact the ability of farmers to select and plant non-genetically-modified seeds. This Section makes the point that loss of farmer choice will result in a concomitant loss of choice for consumers, and will tighten the grip that the remaining agribusiness conglomerates will have on the production of agricultural knowledge. Again drawing on past experience, this Part shows how this consolidation of knowledge is contrary to the public interest. Finally, in Part V, the Article concludes that, should these mergers go through as proposed, the resulting consolidation may jeopardize the burgeoning agroecology movement, and will make food security and sustainability even more difficult to achieve, resulting in a net loss of public welfare.

II. A BRIEF HISTORY OF AGBIOTECH MERGERS

Until fairly recently, seeds were considered a common resource,³¹ and there were hundreds of relatively small seed companies. A few key legal and technical milestones marked the end of this era, and the beginning of consolidation. In 1980, the United States Supreme Court began allowing patenting of genetically-modified organism.³² A few years later, the United States Patent Office followed up by extending those same intellectual property rights to plant varieties—giving patent holders the ability to curtail the traditional farmer’s right to save seeds.³³

These legal and scientific developments unleashed a flood of new genetically-engineered crops.³⁴ Within a decade, roughly 52% of all the corn acreage in the United States, 79% of the cotton, and 87% of the soybean acreage was planted with new, genetically-engineered seeds.³⁵

These new products in turn sparked a wave of mergers. At the same time Monsanto was applying for approval of *Bt* corn³⁶ and Roundup Ready soybeans,³⁷ it was also purchasing nearly

³¹ Philip H. Howard, *Intellectual Property and Consolidation in the Seed Industry*, 55 CROP SCI. 1 (2015).

³² *Diamond v. Chakrabarty*, 447 U.S. 303 (1980)

³³ *Ex parte Hibberd*, 227 U.S.P.Q. 443 (PTO 1985). The Supreme Court upheld this decision in *J.E.M. Agricultural Supply, Inc. v. Pioneer Hi-Bred International, Inc.*, 534 U.S. 124 (2001).

³⁴ Clive James, and A.F. Krattiger, *Global Review of the Field Testing and Commercialization of Transgenic Plants, 1986 to 1995: The First Decade of Crop Biotechnology*, ISAAA Briefs No. 1. (1996) (documenting thousands of field trials).

³⁵ National Agricultural Statistics Service, Acreage 24-25 (June 30, 2005) <http://usda.mannlib.cornell.edu/usda/nass/Acre/2000s/2005/Acre-06-30-2005.pdf#page=24>

40 seed and biotech companies, including industry giants Asgrow, DeKalb and Delta Pine Lands.³⁸ Dow Chemical began purchasing seed companies, including the seed biotech company Micogen, before reforming itself as Dow Agrosciences.³⁹ DuPont responded by acquiring Pioneer, the world's largest seed company.⁴⁰ Hoechst and Rhone Poulenc merged to form Aventis.⁴¹ After the StarLink corn fiasco⁴² Aventis merged with Sanofi,⁴³ selling off its agricultural unit, Aventis CropScience, to Bayer.⁴⁴ Chemical conglomerates AstraZeneca and Novartis merged and spun off their agricultural division as Syngenta.⁴⁵ Cumulatively, this wave of mergers transformed what had been a sector composed primarily of small, family-owned firms into a \$100 billion global industry that integrated seeds, fertilizers and pesticides.⁴⁶ The current crop of mergers must be evaluated against the backdrop of an already concentrated industry.

The new merger proposals differ from the past wave of mergers in that the primary drivers are external to the companies themselves. Over the past four years (2013-2016) farmers around the world have produced record harvests of corn, soybean, and wheat.⁴⁷ As a result, food

³⁶ USDA/APHIS, Monsanto Co: Addition of Two Genetically Engineered Insect Resistant Corn Lines to Determination of Non-Regulated Status, 61 FED. REG. 10720 (March 15, 1996) http://www.aphis.usda.gov/brs/aphisdocs2/96_01701p_com.pdf

³⁷ USDA/APHIS, Availability of Determination of NonRegulated Status of Monsanto Co. Genetically Engineered Soybean Line, 59 FED. REG. 26781 (May 24, 1994) https://www.aphis.usda.gov/brs/aphisdocs2/93_25801p_com.pdf.

³⁸ Barnaby J. Feder, Monsanto to Acquire Two Seed Companies, N.Y. Times (May 12, 1998) <http://www.nytimes.com/1998/05/12/business/monsanto-to-acquire-2-seed-companies.html>.

³⁹ About Dow Agroscience, <http://www.dowagro.com/en-us/about-dow-agrosciences>

⁴⁰ Steven Lipin, Scott Kilman and Susan Warren, *DuPont Agrees to Purchase Of Seed Firm for \$7.7 Billion*, WALL STREET JOURNAL (March 15, 1999).

⁴¹ *Hoechst & Rhone-Poulenc Merge To Create Aventis*, The PharmaLetter (January 12, 1998), <https://www.thepharmaletter.com/article/hoechst-rhone-poulenc-merge-to-create-aventis>

⁴² See Rebecca Bratspies, *Myths of Voluntary Compliance: Lessons from the StarLinkCorn Fiasco*, 27 WM. & MARY ENVTL. L. & POL'Y REV. 593 (2003). *Aventis to Dump AgBiotech in Wake of Starlink Corn Scandal* (November 15, 2000) https://www.organicconsumers.org/old_articles/corp/aventissale.php

⁴³ Nita Raghavan, John Carreyrou, and Gautam Naik, *Sanofi to Swallow Aventis in a Deal Set at \$65 Billion*, Wall Street Journal (April 26, 2004)

⁴⁴ *Bayer Buys CropScience*, CNNMoney (October 2, 2001) <http://cnnfn.cnn.com/2001/10/02/europe/bayer/>.

⁴⁵ Steven Lipin, Anita Raghavan, and Stephen D. Moore, *AstraZeneca, Novartis Confirm Plans To Merge, Spin Off Agrochemical Units*, WALL STREET JOURNAL (December 2, 1999).

⁴⁶ See Dean V. Cavey, *Reflections on Consolidation in the Seed Industry*, VERDANT PARTNERS (June 13, 2016), <http://www.verdantpartners.com/reflections-on-consolidation-in-the-seed-industry/>.

⁴⁷ Andrew Hecht, *Consolidation in the Agricultural Sector*, THE BALANCE (December 5, 2016) <https://www.thebalance.com/consolidation-in-the-agricultural-sector-4117481>.

stockpiles have risen, and prices have fallen dramatically. Current prices for these commodities are less than half the prices the crops commanded during the 2008 food crisis.⁴⁸ These low prices are good news for consumers, but have cut farmer profits, forcing them to cut back spending on seeds and pesticides.⁴⁹ Those farmer cutbacks in turn dragged down profit margins for agricultural companies. Lower sales and reduced margins created a downward pressure on Big Six stocks. It is this vulnerability of stock prices to weak commodity prices,⁵⁰ coupled with pressure from activist investors to take steps to maximize shareholder value, that is driving these mergers.⁵¹ It turns out that ownership of these companies had been consolidating too. In 2016, large asset management firms owned anywhere from 14.65% to 33.36% of the big six companies.⁵² These institutional investors, along with hedge fund activist investors,⁵³ pushed the companies for mergers as a way to boost returns.⁵⁴

If these mergers go forward, Dow/DuPont, and Monsanto/Bayer will have a duopoly that controls 75% of the United States market for corn seeds, 65% of the market for soybeans, and more than half of the market for crop chemicals.⁵⁵ Chem/China will hold 8% of the seed market, and 25% of the agrochemical market.⁵⁶ While the extreme level of consolidation these mergers

⁴⁸ *Id.*

⁴⁹ Brooke Southerland, *Its Hard to Be a Saint in M&A, But Bayer-Monsanto is Trying*, BLOOMBERG (September 15, 2016) (<https://www.bloomberg.com/gadfly/articles/2016-09-15/bayer-monsanto-mega-merger-tries-for-saintly>)

⁵⁰ Nate Birt, *Why Agriculture is Consolidating, Top Producer* (November 18, 2106) <http://www.verdantpartners.com/top-producer-why-agriculture-is-consolidating/>.

⁵¹ See e.g., Jacki Pucci, *The Path Ahead for M & A, Agribusiness Global* (December 29, 2016) <http://www.verdantpartners.com/agribusiness-global-the-path-ahead-for-ma/> (quoting agricultural consultant Partner Garrett Stoerger)

⁵² See, Jennifer Clapp, *Bigger is Not Always Better: Drivers and Implications of the Recent Agribusiness Megamergers*, (2017) at 10.

⁵³ James Fontanella-Khan, Ed Crooks, and Arash Massoudi, *Dow Races to Fend off Loeb with DuPont Merger*, FINANCIAL TIMES (December 9, 2015) <https://www.ft.com/content/7897ad0e-9e95-11e5-8ce1-f6219b685d74>; Stephen Gandel, *Why Dow and DuPont Have to Merge*, Fortune (December 8, 2015) (asserting that “the market was not prepared to wait.”)

⁵⁴ See e.g., Jacki Pucci, *The Path Ahead for M & A, Agribusiness Global* (December 29, 2016) <http://www.verdantpartners.com/agribusiness-global-the-path-ahead-for-ma/> (quoting agricultural consultant Partner Garrett Stoerger)

⁵⁵ David McLaughlin, *Bayer, Monsanto Confront Global Review as Farm Options Shrink*, Bloomberg (September 14, 2016)

⁵⁶ Clapp, *supra* n. 52 at 23. It is worth noting that the precise estimates of market share differ from different sources, but regardless of the specific numbers, the theme of market dominance remains constant.

would represent is unprecedented, it continues two decades of agricultural companies merging to form ever-larger agricultural conglomerates.

Before the latest merger proposals, the market was already astonishingly consolidated, both horizontally and vertically. Just six companies controlled 75% the global agrochemical market, 60% of the global seed market, and conducted more than 75% of private sector agricultural research on seeds and pesticides.⁵⁷ The proposed mergers would reduce that number even further—down to four. The companies looking to merge are currently in the same market, thus the mergers would increase horizontal control. The deals would also extend control vertically along the supply chain by integrating within the remaining companies a vast array of intellectual property rights over traits, germplasm, breeding programs, technologies, and crop protection products. Describing the newest consolidation wave as a “tsunami” Iowa Senator Charles Grassley mused in hearings before the Senate Judiciary Committee about when the “size of companies and concentration in the market reach[es] a tipping point, so much that a market becomes anti-competitive.”⁵⁸ In the European Union, Green Party was more blunt, characterizing the ostensible aim of the mergers to be market dominance.⁵⁹

III. DETAILS OF THE MERGER PROPOSALS

A. Dow/DuPont

The Dow/DuPont ‘merger of equals’⁶⁰ would result in the two chemical giants combining into one company. The plan is that within two years, that one company would divide into 3 separate companies. With regard to the agbiotech holdings of both companies, this merger would

⁵⁷ See *Breaking Bad: Big Ag Mega-Mergers in Play* 1, 4, ETC GROUP (Dec. 2015), http://www.etcgroup.org/sites/www.etcgroup.org/files/files/etc_breakbad_23dec15.pdf; Philip H. Howard, *Visualizing Consolidation in the Global Seed Industry: 1996-2008*, SUSTAINABILITY 1266, 1267 (2009); Clapp, *supra* n.52.

⁵⁸ Prepared Statement of Senator Chuck Grassley of Iowa, Chairman, Senate Judiciary Committee Hearing on Consolidation and Competition in the U.S. Seed and Agrochemical Industry, (September 20, 2016) <https://www.judiciary.senate.gov/imo/media/doc/09-20-16%20Grassley%20Statement.pdf>

⁵⁹ White, *supra* n. 12.

⁶⁰ Jack Kaskey and Simon Casey, DuPont, Dow Chemical to Combine in Merger of Equals, Bloomberg (December 11, 2015) <https://www.bloomberg.com/news/articles/2015-12-11/dow-chemical-dupont-agree-to-combine-in-merger-of-equals>.

result in the spin-off of a “pure play agriculture company” that would combine DuPont’s and Dow’s seed and crop protection businesses.⁶¹ This new agriculture company is projected to have \$16 billion in revenue,⁶² and to control 40% of the United States corn and soybean markets.⁶³ The agricultural share of the merger synergies, projected to be \$1.3 billion dollars,⁶⁴ will be achieved through elimination of “duplicative R&D programs including breeding, traits and chemical discovery”⁶⁵ even as the companies tout the combination of their germplasm, traits and crop protection portfolios.⁶⁶ At the same time, the merger would “rationalize and prioritize spending as it relates to breeding, biotechnology and discovery programs”⁶⁷ while “increas[ing] cross sell opportunities.”⁶⁸ Overall, the merger projects a 10% decrease in research and development spending.⁶⁹

European Union regulators raised serious concerns about the Dow/DuPont merger, focusing specifically on the merger’s impact on research and development, concerns about higher prices for consumers, and the potential for unreasonably high barriers to entry.⁷⁰ Indeed, in December 2016, the Commission presented Dow/DuPont with a 700 page statement of objections. In response, Dow and DuPont committed to asset sales and the transfer of research and development activities.⁷¹ These efforts paid off, and the EU granted conditional approval on

⁶¹ Press Release: Merger of Equals, *supra* n. 3.

⁶² See *Dow DuPont S4-Investor-Presentation* (March 2, 2016), at 15, available from <http://www.dowdupontunlockingvalue.com/for-shareholders#faqs>

⁶³ Sam Thielman, *Chemical Giants Dow Chemical and DuPont Announce \$130bn Merger*, THE GUARDIAN (Dec. 11, 2015), <https://www.theguardian.com/business/2015/dec/11/dow-chemical-dupont-merger-dowdupont>; John Cassidy, *A Dow DuPont Merger Would Raise Big Questions*, NEW YORKER (Dec. 9, 2015), <http://www.newyorker.com/news/john-cassidy/a-dow-dupont-merger-would-raise-big-questions>.

⁶⁴ *Id.*

⁶⁵ See *DuPont and Dow to Combine in Merger of Equals Slide Show* (December 11, 2015) at 8, available from <http://www.dowdupontunlockingvalue.com/for-shareholders#faqs>.

⁶⁶ *Id.* at 22.

⁶⁷ *Id.* at 16.

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ European Commission, *Mergers: Commission opens in-depth investigation into proposed merger between Dow and DuPont* (August, 11, 2016) http://europa.eu/rapid/press-release_IP-16-2784_en.htm.

⁷¹ On March 31, DuPont announced that it will sell most of its research and development pipeline to chemical giant FMC. Joyce Hansen, *DuPont Divests Crop Unit In \$1.6B Asset Swap With FMC*, LAW360 (April 3, 2016) <https://www.law360.com/foodbeverage/articles/908420/dupont-divests-crop-unit-in-1-6b-asset-swap-with->

March 27, 2017.⁷² The conditions focused on divestments intended to “preserv[e] price and innovation competition in pesticide markets.”⁷³ Among the more notable requirements is the sale of DuPont’s global research and development organization.⁷⁴ The Commission concluded that this set of divestments would adequately preserve competition on price and choice, and would maintain innovation.⁷⁵ Surprisingly, the EU did not require any divestitures in the combined seed holdings of the two companies.⁷⁶ However, India’s antitrust regulator, the Competition Commission, has raised similar concerns, and instituted a full comment process after concluding that the Dow/DuPont merger was “likely to have an appreciable adverse effect on competition.”⁷⁷

B. Bayer/Monsanto

The Bayer/Monsanto merger raises similar concerns about overlap, even though the merger is pitched as combining Bayer’s expertise in pesticides with Monsanto’s capacity in seed genetics and biotechnology. Throughout the promotional literature, Monsanto and Bayer have been careful to describe the merger, which they project will save the combined company \$1.5 billion per year,⁷⁸ as combining complementary rather than competitive businesses.⁷⁹ Indeed

fmc?nl_pk=61c529df-105e-4c03-ac99-062925367e94&utm_source=newsletter&utm_medium=email&utm_campaign=foodbeverage

⁷² Foo Yun Chee, *Asset Sales Plan Secures EU backing for \$130 bln Dow, DuPont merger*, REUTERS (March 27, 2017) <http://www.reuters.com/article/us-du-pont-m-a-dow-eu-idUSKBN16Y16Q>; Foo Yun Chee, *EU Regulators to Clear Dow, ChemChina Next Week*, Reuters (March 23, 2017)

⁷³ Press Release, *Mergers: Commission clears merger between Dow and DuPont, subject to conditions* (European Commission, March 27, 2017) http://europa.eu/rapid/press-release_IP-17-772_en.htm (quoting Competition Policy Commissioner Margrethe Vestager as saying that the conditional approval “ensures that the merger between Dow and DuPont does not reduce price competition for existing pesticides or innovation for safer and better products in the future.”)

⁷⁴ *Id.*

⁷⁵ The Commission noted that this transaction was one of three proposed mergers in this industry. However, according to its practices, the Commission assessed the proposed Dow/DuPont merger independently, based on the current market situation. This is because the Commission uses a priority rule to assess parallel transactions. In other words, “first come, first served.” *Id.*

⁷⁶ Foo Yun Chee, *Asset Sales*, *supra* n. 72 (quoting Bernstein analysts as saying “The main surprises here are the inclusion of the pesticides and the exclusion of any kind of seed assets”).

⁷⁷ *CCI Seeks Comments on Dow Chemical and DuPont Merger*, LiveMint (March 23, 2017) <http://www.livemint.com/Companies/npW0etffwoEEA2G0hY9bDP/CCI-seeks-comments-on-Dow-Chemical-Du-Pont-merger.html>.

⁷⁸ Monsanto Schedule 14A, *supra* n. 11 at 11.

Monsanto CEO Hugh Grant even went so far as to claim that there is “very little overlap” between the two companies.⁸⁰ And yet, one need barely scratch the surface to find serious antitrust and anticompetitive ramifications from this proposed merger.

For example, in its official merger proposal materials, Monsanto uses Soybeans in Brazil as an example of how the combination will “fully address farmers’ needs” at every stage of the growth cycle.⁸¹ Monsanto provides a horizontal timeline mapping agricultural inputs at various stages of crop growth. This presentation shows no overlapping Monsanto/Bayer products, but instead suggests that complementary products currently sold by one company or the other could, in a combined company, meet farmer needs at each stage of the process.⁸² Yet, only a year ago, Bayer was making headlines with its plan to “take on Monsanto in Brazil.”⁸³ At the time, Bayer’s spokesman asserted that “[f]armers need alternative tools.”⁸⁴ Indeed, past interactions between Bayer and Monsanto have given Brazilian antitrust regulators pause. In 2014, Brazilian regulators required revisions to a licensing agreement between Bayer and Monsanto because of concerns that the terms would have given Monsanto too much control over Bayer’s conduct in the Brazilian soybean market.⁸⁵ The loss competition this merger represents in this one market is emblematic of the broader concerns raised by this proposed merger. Indeed, Monsanto itself

⁷⁹ *Id.* “The combined entity will have the most comprehensive and diverse portfolio and a robust pipeline with exceptional growth opportunities in the near-, mid- and long-term. The complementary offerings of the two companies will provide growers across geographies with a broad portfolio of solutions and greater choice.”

⁸⁰ Guy Chazan, *Bayer Targets One Stop Shop with Monsanto*, FINANCIAL TIMES (September 14, 2016) <https://www.ft.com/content/3d972e64-7a5e-11e6-ae24-f193b105145e>

⁸¹ Monsanto Schedule 14A, *supra* n. 11 at 11.

⁸² *Id.*

⁸³ Gerson Freitas Jr, *Bayer Plans to Take on Monsanto in Brazil With GMO Soybean Seeds*, *Bloomberg* (March 9, 2016) <https://www.bloomberg.com/news/articles/2016-03-09/bayer-plans-to-take-on-monsanto-in-brazil-with-gmo-soybean-seeds>; Linda Kiernan, *Bayer, BASF to Challenge Monsanto’s Reign Over Brazilian Seed Market* (March 15, 2016) <http://www.oilseedandgrain.com/single-post/2016/03/15/Bayer-BASF-to-Challenge-Monsantos-Reign-Over-Brazilian-Seed-Market>.

⁸⁴ Freitas, *supra* n. 83 (quoting Eduardo Mazzieri, Bayer’s Brazilian seed unit director).

⁸⁵ Melissa Lipman, *Brazil Puts Limits On Monsanto-Bayer Licensing Deal*, LAW360 (January 23, 2014) <https://www.law360.com/foodbeverage/articles/503425/brazil-puts-limits-on-monsanto-bayer-licensing-deal>

notes that a “combined company with strong positions across all technologies offers high value capturing opportunity in corn and soy in key growing regions.”⁸⁶

Consolidation in cottonseed market in the Southern United States raises an even bigger concern. Roughly a decade ago, in the context of another merger—this one between Monsanto and Delta & Pine Land (DPL)—the Department of Justice found that a proposed merger “would likely lessen competition in the near, medium and long-term,”⁸⁷ in violation of the Clayton Act.⁸⁸ The combined company would have controlled 95% of cottonseed sales in key United States markets.⁸⁹ Using accepted measures of market concentration, the DOJ determined that the merger would produce a highly concentrated market, presumptively raising antitrust concerns.⁹⁰ The DOJ concluded that the merger would substantially lessen competition,⁹¹ and that, as a result, “farmers likely will have fewer choices and face higher prices.”⁹²

In order to prevent a post-merger monopoly over cottonseeds in key markets, regulators required Monsanto spinning off another of its acquisitions—Stoneville Seed—to a company deemed capable of competing effectively with Monsanto in the region.⁹³ The purchaser was Bayer.⁹⁴ Indeed, DOJ approved the Monsanto/DPL merger in part on the strength of Bayer’s

⁸⁶ *Id.* at 12.

⁸⁷ Department of Justice Antitrust Division, *United States v. Monsanto Company and Delta and Pine Land Company; Public Comments and Response on Proposed Final Judgment Notice*, 73 FED. REG.18612, 18614 (April 4, 2008) (Hereafter Monsanto and DPL Merger: Public Comments).

⁸⁸ On May 31, 2007, the Department of Justice filed a complaint in United States District Court for the District of Columbia alleging that the proposed merger would substantially lessen competition in violation of Section 7 of the Clayton Act, 15 U.S.C. §18. *United States v. Monsanto Company and Delta and Pine Land Company*, Case 1:07-cv-00992 (May 31, 2007). <https://www.justice.gov/atr/case-document/complaint-161>. Paragraph 8 of the complaint alleged that the proposed merger would “eliminate[e] competition between these firms in the sale of cottonseed...[and] will also eliminate DPL as a partner independent of Monsanto for competing trait developers, substantially delaying or preventing the development and introduction of cottonseed containing non-Monsanto traits.”

⁸⁹ *Id.* at ¶39.

⁹⁰ *Id.* at ¶40, Appendix A (explaining that any increase of more than 100 on the Herfindahl-Hersheim Index raised presumptive antitrust concerns, and the Monsanto DPL merger would raise the index by 3310 in one key cottonseed market, and by 1489 in another.)

⁹¹ *Id.* at ¶45.

⁹² *Id.* at ¶41.

⁹³ Monsanto and DPL Merger: Public Comments, *supra* n. 87 at 18,614-18,615. Monsanto also had to divest another smaller brand, NextGen.

⁹⁴ *Id.*

capacity to compete against Monsanto in key cotton growing regions.⁹⁵ And, Bayer proved itself an effective competitor—capturing nearly 40% of the total United States cottonseed market in 2015,⁹⁶ to Monsanto’s 32%.⁹⁷ The newly-proposed Bayer/Monsanto merger would reunite those divested assets, recreating the monopoly that United States regulators previously found to be a violation of the Clayton Act. Indeed, in 2016 Bayer and Monsanto collectively hold somewhere between 58 and 70 percent of the total United States cottonseed market.⁹⁸ Even Bayer’s CEO Liam Condon concedes that the combined market share is “quite high.”⁹⁹

Another area of dramatic overlap between the two companies is canola seed. Canola is Canada’s largest and most important crop. Bayer and Monsanto are currently the two biggest suppliers for canola seed—each holding roughly half the market.¹⁰⁰ A combined Bayer-Monsanto would have a monopoly on this market. Despite the company’s general commitment to a narrative that the two companies do not overlap, Bayer CEO conceded that canola divestments would be necessary,¹⁰¹ and Bayer has already begun the process of selling some of these assets.¹⁰²

C. ChemChina/Syngenta

The ChemChina/Syngenta merger is on slightly different footing. ChemChina does not have any stake of the global seed industry, so its merger with Syngenta will not increase market consolidation there. For this merger, concerns focus on overlap in their pesticide holdings, and

⁹⁵ *Id.*

⁹⁶ Jack Kaskey, *Bayer-Monsanto Combination Likely Too Big in Cottonseed*, BloombergMarkets (September 15, 2016). According to this article, Bayer’s share for 2016 was lower, roughly 25%, which is still a major hold on the market.

⁹⁷ *Id.*

⁹⁸ David J. Lynch and Guy Chazan, *Bayer-Monsanto Sow Seeds of Doubt Among Regulators*, FINANCIAL TIMES (May 30, 2016).

⁹⁹ Pucci, *supra* n. 51.

¹⁰⁰ Jennifer Clapp, Chelsie Hunt, and Carly Hayes, *Bigger Isn’t Always Better: What the Proposed Agribusiness Mega Mergers Could Mean for Canada*, FOOD SECURE CANADA (SEPTEMBER 14, 2016) <https://foodsecurecanada.org/resources-news/news-media/big-6-agribusiness-mega-mergers-canada>.

¹⁰¹ *Bayer to Sell Some Cotton and Canola Business as Part of Monsanto Takeover*, Reuters (November 28, 2106).

¹⁰² *Bayer Monsanto Start Asset Sale Toward Merger Clearance*, REUTERS (March 10, 2017) <https://www.agcanada.com/daily/bayer-monsanto-start-asset-sale-toward-merger-clearance>

concerns about using tying tactics to dominate markets. Of course, the fact that ChemChina is a state-owned entity adds an additional regulatory wrinkle. In the United States, two approvals are needed whenever a foreign-owned company seeks to merge or buy a domestic company. First, there must be a national security clearance before antitrust regulators reach the questions of market dominance. ChemChina received that first approval from the Committee on Foreign Investment in August 2016. This approval came over heavy objections from farmers, conservationists,¹⁰³ and politicians¹⁰⁴ from farming states, who argued that food security was a component of national security.¹⁰⁵ In February 2017, the United States Federal Trade Commission asked for more time to review the deal.¹⁰⁶

Responding to the antitrust aspects of the proposed ChemChina/Syngenta merger, both European Union and United States regulators have requested additional information, with the European Union signaling concerns that the merger “might raise prices or reduce choice from crop protection products sold to farmers.”¹⁰⁷ The European Union regulators noted that ChemChina and Syngenta have overlapping portfolios of herbicides, insecticides, fungicides and

¹⁰³ Letter from Food & Water Watch and the National Farmers Union to Sec’y Jacob Lew, et al. “Re: China National Chemical Corporation proposed purchase of Syngenta AG,” July 21, 2016. Available at: <http://nfu.org/wp-content/uploads/2016/07/FWW-NFU-letter-to-CFIUS-on-ChemChina-Syngenta-7-21-2016-2.pdf>

¹⁰⁴ U.S. Senate Committee on Agriculture, Nutrition, & Forestry, “Senators Call On Treasury Department To Review ChemChina’s Acquisition of Syngenta,” March 24, 2016. Available at: <http://www.agriculture.senate.gov/newsroom/dem/press/release/senators-call-on-treasury-department-to-review-chemchinas-acquisition-of-syngenta->

¹⁰⁵ Reportedly, the Committee explicitly bracketed any concerns about the impact the deal would have on farmers. See Benjamin Horney, *3Takeaways from CFIUS’s OK of ChemChina-Syngenta Deal*, Law360 (August 23, 2016) <https://www.law360.com/articles/831282/3-takeaways-from-cfius-ok-of-chemchina-syngenta-deal>. Opposition to this merger was so strong that it prompted proposed legislation to change the composition and charge of the committee approving such mergers. See Securing American Food Equity Act of 2016, S. 3161, 114th Cong. § 2 (2016). Available at: <http://www.grassley.senate.gov/sites/default/files/constituents/Agriculture%2C%2007-12-16%2C%20USDA%20in%20CFIUS%20bill%20text.pdf>.

¹⁰⁶ Alice Baghdjian, Sara Forden, and David McLaughlin, *Syngenta Says U.S. Extends Antitrust Review of ChemChina Deal*, BLOOMBERG (February 13, 2107) <https://www.bloomberg.com/news/articles/2017-02-13/syngenta-says-u-s-extends-antitrust-review-of-chemchina-deal>

¹⁰⁷ *Syngenta Takeover Hits Another Snag*, BLOOMBERG (February 14, 2017) <http://www.agweb.com/article/syngenta-takeover-hits-another-snag-blmg/>; European Commission, Mergers: Commission opens in-depth investigation into proposed acquisition of Syngenta by ChemChina (October 28, 2016) http://europa.eu/rapid/press-release_IP-16-3579_en.htm.

plant growth regulators,¹⁰⁸ and in some markets the two companies may be direct competitors.¹⁰⁹ Regulators also noted that the parties have relatively high combined market shares in many markets.¹¹⁰ However, Syngenta and ChemChina remain confident that they will receive the necessary approvals in the very near future. Australia has already granted ChemChina the necessary antitrust approval.

IV. SYSTEM-WIDE CONCERNS RAISED BY THESE MERGERS

The Department of Justice's Horizontal Merger Guidelines make it clear that, under Section 7 of the Clayton Act, regulators should not permit mergers that "create, enhance, or entrench market power or [] facilitate its exercise."¹¹¹ These Guidelines explain that a merger should be deemed to enhance market power if it will likely "encourage one or more firms to raise price, reduce output, diminish innovation, or otherwise harm customers as a result of diminished competitive constraints or incentives."¹¹² In other words, this body of law is "intended to protect customers from the potential for diminished competition."¹¹³ To assess the likelihood of this outcome, regulators consider, *inter alia*, the impact of recent mergers in the relevant market, and both the level of concentration, and the change in concentration caused by the merger.¹¹⁴

Even before these mergers, the HHI index for the corn seed and cotton seed were above 2500—the threshold for considering a market to be highly consolidated.¹¹⁵ Soy was at 2360—pretty close to that threshold.¹¹⁶ The projections for concentration after these mergers are even

¹⁰⁸ European Commission, Mergers: Commission opens in-depth investigation into proposed acquisition of Syngenta by ChemChina (October 28, 2016) http://europa.eu/rapid/press-release_IP-16-3579_en.htm.

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

¹¹¹ U.S. Dep't of Justice & Fed. Trade Comm'n, *Horizontal Merger Guidelines 2* (2010), <https://www.justice.gov/sites/default/files/atr/legacy/2010/08/19/hmg-2010.pdf>.

¹¹² *Id.*

¹¹³ Acting Associate Attorney General Bill Baer, Remarks at American Antitrust Institute's 17th Annual Conference (June 16, 2016) <https://www.justice.gov/opa/speech/acting-associate-attorney-general-bill-baer-delivers-remarks-american-antitrust-institute>

¹¹⁴ *DOJ Merger Guidelines*, *supra* n. __ at 3

¹¹⁵ Texas A& M Study, *supra* n. 28 at 24. (specifically, corn was at 2696 and cotton was at 2804).

¹¹⁶ *Id.*

higher—with all three markets well above the threshold to be considered highly consolidated, with the HHI index for cotton seed at a staggering 5205.¹¹⁷

Given the extraordinary number of mergers in this industry, there is a wealth of evidence about the market impacts of past mergers for regulators to consider. Over the past two decades, this industry has been consolidating—driven largely by new technologies and new intellectual property rights over seeds. A few industry giants emerged from the consolidation of hundreds of smaller firms. Companies merged, or purchased rivals to acquire access to technology and to share the large cost of obtaining regulatory approval for new products.¹¹⁸ Using the experiences from these past mergers as a guide for predicting impacts of the currently proposed mergers, it seems clear that their cumulative effect, and possibly their individual impacts, will violate Section 7. Collectively, these mergers will reduce farmer choice, and will likely lead to higher prices for farmers and consumers, while producing less investment in innovation.

A. Anticompetitive Behavior: Raising Prices

In evaluating the likely antitrust implication of a merger, one red flag that regulators look for is “explicit or implicit evidence that the merging parties intend to raise prices,[or] reduce output or capacity.”¹¹⁹ Describing her role in investigating these mergers, European Union Competition Commissioner Margrethe Vestager echoed this concern stating: “[t]he livelihood of farmers depends on access to seeds and crop protection at competitive prices. We need to make sure that the proposed merger does not lead to higher prices . . . or less innovation for these products.”¹²⁰ This focus on how a proposed merger will impact prices echoes the concern expressed in the DOJ Guidelines caution that when mergers result in enhanced market power,

¹¹⁷ *Id.* The post merger figures for corn and soybean would be 3100, and 2705 respectively.

¹¹⁸ Keith Fuglie, et al., *Rising Concentration in Agricultural Input Industries Influences New Farm Technologies*, USDA Amber Waves (December 2012) <https://www.ers.usda.gov/amber-waves/2012/december/rising-concentration-in-agricultural-input-industries-influences-new-technologies/>

¹¹⁹ *DOJ Merger Guidelines*, *supra* n. __ at 4.

¹²⁰ European Commission, *Mergers: Commission opens in-depth investigation into proposed merger between Dow and DuPont* (August 11, 2016) http://europa.eu/rapid/press-release_IP-16-2784_en.htm (referring specifically to the Dow/DuPont merger).

sellers often elevate the prices charged to customers.¹²¹ This is because reduced competition allows them to charge higher prices than their products would command in a more competitive market.¹²² The challenge here is that there are three nearly simultaneous mergers. Analyzing the effects on pricing that each merger might have individually fails to capture their cumulative impacts.

Greater market power resulting from the structural changes in agricultural input industries has already resulted in higher prices. For example farmers planting genetically-engineered soybeans in 2010 paid 143% more for those seeds than they had paid for genetically-engineered seeds a decade earlier.¹²³ These price increases meant that purchasing these seeds cost farmers 16.4% of their crop's ultimate sale price—twice the historic norm of 4–8%.¹²⁴ The prices farmers received for their crops did not keep pace—indeed, the cost of seeds more than doubled relative to the price of harvested crops.¹²⁵ Between 1994 and 2010, the cost of a bag of seed corn in the United States more than quadrupled, and soybean more than quintupled.¹²⁶ Between 1995 and 2015, as the seed industry consolidated dramatically, prices for corn and soy seeds increased more than 300%.¹²⁷ In recent years, the combined impact of a diminished ability to save seeds and fewer options in the market, has led to seed prices increasing as much as 30% annually—significantly higher than the rate of inflation.¹²⁸ Critics have been claiming for years that market consolidation has meant that there are no longer any competitive restraints on price

¹²¹ DOJ Merger Guidelines, *supra* n. ___, at 2.

¹²² *Id.*

¹²³ Charles Benbrook, Critical Issue: The Seed Price Premium, The Organic Center 2 (December 2009) file:///C:/Users/rebb_000/Desktop/rebecca/food%20justice%20and%20corporate%20control%20through%20gmos/SeedPricesReport.pdf

¹²⁴ *Id.*

¹²⁵ Hope Shand *The Big Six: A profile of corporate power in seeds, agrochemicals & biotech*, The Heritage Farm Companion 10-15 (2012).

¹²⁶ A bag of seed corn went from \$65 to \$300 and soybean from \$12 to \$70. Dean V. Cavey, *Reflections on Consolidation in the Seed Industry*, VERDANT PARTNERS (June 13, 2016), <http://www.verdantpartners.com/reflections-on-consolidation-in-the-seed-industry/>.

¹²⁷ Dan Nosowitz, *How Will the Monsanto-Bayer Merger Affect Everyday Farmers?* MODERN FARMER (October 20, 2016) <http://modernfarmer.com/2016/10/monsanto-bayer-merger-2/> (quoting Alicia Harvie of Food Aid)

¹²⁸ Hubbard (2015)

increases,¹²⁹ aside from what one Monsanto official described as “pass[ing] the red-faced test from the Panhandle of Texas to McLean County, Ill.”¹³⁰

Farmers opposed to these mergers have been vocal about their concerns about price increases.¹³¹ And, they have reason to be concerned. A recent study by Texas A&M University projected that the proposed mergers will likely cause increases in seed prices that range from roughly 2% for corn and soybeans to just over 18% for cotton.¹³² However, the study gives pretty good odds (1 in 4) of a 20% cottonseed price increase as a result of the mergers.¹³³ Past experience with mergers in the agricultural industry suggests that regulators should take these projections seriously.

B. Anticompetitive Behavior: Reducing Choice

Another red flag that antitrust regulators look for is explicit or implicit evidence that proposed mergers will “reduce product quality or variety, withdraw products or delay their introduction...”.¹³⁴ The regulatory focus here is on the impact a merger will have on customers, both direct and final.¹³⁵ The DOJ Guidelines note that enhanced market power makes it more likely that the merged entity can profitably and effectively engage in exclusionary conduct.¹³⁶ Speaking for the EU, Margrethe Vestager also emphasized that farmers must continue to have choice.¹³⁷

¹²⁹ Mike Callicrate, *Monsanto Corn Seed Price Hikes a Threat to Agriculture*, Organization for Competitive Markets (July 28, 2008) <http://competitivemarkets.com/monsanto-corn-seed-price-hikes-a-threat-to-agriculture/>

¹³⁰ *Farm & Food: The Seeds of Farm-Input Inflation*, Lincoln Journal Star (August 8, 2008) (quoting Monsanto executive John Janson).

¹³¹ Chris Clayton, *Groups Write to AG Opposing Seed-Chemical Mergers*, DTN (February 13, 2017) <https://www.dtnpf.com/agriculture/web/ag/perspectives/blogs/ag-policy-blog/blog-post/2017/02/13/groups-write-ag-opposing-seed>.

¹³² Texas A&M Food Policy Center, *Effects of Proposed Mergers And Acquisitions Among Biotechnology Firms on Seed Prices 1* (September 2016) https://www.afpc.tamu.edu/pubs/0/675/WP_16-2.pdf.

¹³³ *Id.*

¹³⁴ *Id. at 4.*

¹³⁵ DOJ Guidelines, *supra* n. 111 at 2.

¹³⁶ *Id.*

¹³⁷ *Farmers must have choice post Bayer-Monsanto merger: EU's Vestager*, Reuters (September 15, 2016) <http://mobile.reuters.com/article/idUSKCN11L1VG?mod=related&channelName=>

Each of the three proposed agribusiness mergers emphasizes farmer choice as a justification. Indeed, Bayer CEO Werner Baumann addressed this issue directly, stating “it is not our plan our ambition or our intent to prevent farmers from having choice.”¹³⁸

Yet, the overwhelming evidence shows that past consolidation in the industry has reduced, rather than increased farmer choice. Farmers have expressed concern that even before the mergers they had very little choice when purchasing inputs like seeds and chemicals.¹³⁹ Indeed, as early as 2000, the GAO was cautioning about Monsanto’s use of intellectual property rights to obtain “greater control over seed prices” and “to restrict the availability and use of seeds” by limiting the traditional farmer practice of seed saving.¹⁴⁰

Experience bears out this caution. Consolidation in the seed industry has generally led to reductions in farmer choice.¹⁴¹ Recent studies have documented that consolidation had decreased in the number of available cultivars (especially non-genetically engineered options), had shifted focus to crops and hybrids more profitable to the companies,¹⁴² and had resulted in the termination of breeding programs for regionally relevant crops.¹⁴³ By contrast, in markets without significant consolidation, where local seed companies and breeding organizations retain significance, farmers have wider options and choices. Studies from the United States,¹⁴⁴ India,¹⁴⁵

¹³⁸ Christopher Doering, *Monsanto, Bayer deal raises farmers’ anxiety level*, DES MOINES REGISTER (September 14, 2016) <http://www.desmoinesregister.com/story/money/business/2016/09/14/monsanto-bayer-deal-raises-farmers-anxiety-level/90354030/>

¹³⁹ Dan Nosowitz, *supra* n. 127 (quoting Kansas farmer Tom Giessel as saying “There is no choice, they own me.”)

¹⁴⁰ See U.S. Gen. Acct. Off., *Information on Prices of Genetically Modified Seeds in the United States and Argentina* 12 (Jan. 2000), <http://www.gao.gov/products/GAO/T-RCED/NSIAD-00-228>.

¹⁴¹ Angelika Hilbeck et. al, *Farmer’s Choice of Seeds in Four EU Countries Under Different Levels of GM Crop Adoption*, 25 ENV. SCI. EUROPE 1, 1 (2013), <http://www.enveurope.com/content/25/1/12> (documenting that European countries permitting the sale of genetically engineered seeds have experienced a decline in available seed crop diversity, while that same measure of diversity has either remained the same or increased in countries that prohibit genetically-engineered seeds).

¹⁴² Soy farmers in Brazil and South Africa allege that the Big Six dictate what seeds will be available, and refuse to make significant quantities of non-genetically engineered seeds available. Ken Roseboro, *The GMO Seed Monopoly: Fewer Choices Higher Prices*, Food Democracy Now (October 4, 2013) http://www.fooddemocracynow.org/blog/2013/oct/4/the_gmo_seed_monopoly_fewer_choices_higher_prices (

¹⁴³ *Id. see also*, Svein Øivind Solberg & Line Breian, *Commercial Cultivars and Farmers’ Access to Crop Diversity: A Case Study From the Nordic Region*, 24 AGRIC. AND FOOD SCIENCE 150, 150 (2015).

¹⁴⁴ *Finding Non-GMO Soybean Seed Becoming More Difficult*, THE ORGANIC & NON-GMO REPORT (July/Aug. 2008), http://www.non-gmoreport.com/articles/jul08/nongmo_soybean_seed.php.

and South Africa¹⁴⁶ have shown that market consolidation leads, in particular, to decreased availability of non-engineered crop cultivars,¹⁴⁷ and in extreme situations has resulted in farmers only having access to genetically-engineered cultivars.¹⁴⁸ Indeed, the National Research Council has raised concerns that market concentration of seed suppliers has negatively affected farmer planting options and cultural diversity.¹⁴⁹

The United States recent experience with sugar beets offers a clear example of how market dominance can entirely eliminate farmer choice. In 2005, the USDA deregulated genetically-engineered sugar beets.¹⁵⁰ Despite lengthy litigation challenging the adequacy of the environmental analysis accompanying this decision,¹⁵¹ within 5 years 95% of the sugar-beet crop was genetically-engineered.¹⁵² One consequence of this market domination was that non-genetically-engineered seeds were next to impossible to obtain.¹⁵³ That meant when major food companies decided to eliminate genetically-engineered ingredients, including sugar, from their consumer products,¹⁵⁴ United States sugar beet farmers were stuck. They were unable to switch

¹⁴⁵ Glenn Davis Stone, *Field Versus Farm in Warangal: Bt Cotton, Higher Yields, and Larger Questions*, 39 *WORLD DEV.* 387, 392–95 (2011).

¹⁴⁶ Harald Witt et al., *Can the Poor Help GM Crops? Technology, Representation & Cotton in the Makhathini Flats, South Africa*, 33 *REV. AFR. POL. ECON.* 497, 507–08 (2006).

¹⁴⁷ Hilbeck, *supra* note 141, at 1.

¹⁴⁸ *Sugar Beet Industry Converts to 100% GMO, Disallows Non-GMO Option*, *THE ORGANIC & NON-GMO REPORT* (June 2008), http://www.non-gmoreport.com/articles/jun08/sugar_beet_industry_convert_to_gmo.php.

¹⁴⁹ NAT'L RESEARCH COUNCIL, *THE IMPACT OF GENETICALLY ENGINEERED CROPS ON FARM SUSTAINABILITY IN THE UNITED STATES* 2, 13 (2010).

¹⁵⁰ USDA, *Determination of Non-Regulated Status for Sugar Beets Genetically Engineered for Tolerance to the Herbicide Glyphosate*, 70 *Fed. Reg.* 13007 (March 17, 2005). For background information, *see*, USDA APHIS, *ENVIRONMENTAL ASSESSMENT IN RESPONSE TO PETITION NO. 03-323-01P 3* (2004), http://www.aphis.usda.gov/brs/aphisdocs/03_32301p_pea.pdf.

¹⁵¹ *See, e.g., Ctr. for Food Safety v. Vilsack*, 753 F. Supp. 2d 1051, 1053 (N.D. Cal 2010), *vacated and remanded*, 636 F.3d 1166, (9th Cir. 2011), *appealed*, Nos. 11–16468, 11–16564, 502 F. App'x 647 (9th Cir. Nov. 15, 2012). For a detailed discussion of this litigation, *see* Rebecca M. Bratspies, *Is Anyone Regulating? The Curious State of GMO Governance in the United States*, 37 *VERMONT L. REV.* 923, 948–51 (2013).

¹⁵² *U.S. Sugar Production*, USDA ERS, <http://www.ers.usda.gov/topics/crops/sugar-sweeteners/background.aspx> (last visited Nov. 8, 2016).

¹⁵³ Barry Estabrook, *Sugar-Beet Flip-Floppers, and Other Sustainability News*, *ATLANTIC* (Nov. 2, 2010), <http://www.theatlantic.com/health/archive/2010/11/sugar-beet-flip-floppers-and-other-sustainability-news/65530/>.

¹⁵⁴ The list of major companies making this choice includes General Mills, Post, Hershey, and Unilever. *See* “Major Momentum Building Fast” for Non Genetically Engineered Food as 10 Top Companies Respond to Growing Pressure Demand to Curb GMOs, *GMO INSIDE BLOG* (June 7, 2016), <http://gmoinside.org/the-tipping-point-is-here-on-gmos-with-10-major-companies-shifting-to-non-gmo-products/>. Del Monte is also eliminating genetically-

to non-genetically-engineered sugar beets because the seeds were unavailable.¹⁵⁵ As a result, these sugar beet farmers lost market share to sugar cane producers.¹⁵⁶ USDA was forced to raise sugar imports quotas by 200,000 tons in order to meet demand that could no longer be filled by domestic farmers because the necessary seeds were no longer available.¹⁵⁷

Aside from directly eliminating cultivars, the Big Six have used two other tactics that limit farmer choice. First, a great deal of research and development has focused on creating ‘platforms’ of traits, seeds and chemicals.¹⁵⁸ With this style of product development, one purchase locks a farmer in to the entire platform.¹⁵⁹ These tactics have been very profitable for the companies deploying them, but those profits come at the expense of reduced farmer options.¹⁶⁰ The companies are clear that their intention is to create even more tightly tied products. For example, the Bayer/Monsanto merger documents make no secret of the fact that their goal in “combining both companies commitment to quality and passion for innovation”¹⁶¹ is to “provide our customer with a highly-integrated product”¹⁶² and the message to shareholders is that these integrated platforms will highly profitable for the combined company.¹⁶³ Critics argue that the “platforms” that result from these mergers are likely to be engineered for the purpose of

engineered ingredients. Lucinda Shen, *Del Monte Is Making This Huge Change to its Products*, FORTUNE (Mar. 29, 2016), <http://fortune.com/2016/03/29/del-monte-natural-products/>.

¹⁵⁵ *About Roundup Ready Sugar Beets*, USDA Aphis, https://www.aphis.usda.gov/aphis/ourfocus/biotechnology/brs-news-and-information/CT_Sugarbeet_about (last modified Jan. 26, 2016).

¹⁵⁶ Tom Meersman, *Hershey Dumps Sugar Beets Because of GM Concerns*, SPOKESMAN-REVIEW (Jan. 10, 2016), <http://www.spokesman.com/stories/2016/jan/10/hershey-dumps-sugar-beets-because-of-gm-concerns/>; Colleen Scherer, *GM Concerns Lead Hershey to Reject Sugar Beets*, FARM JOURNAL’S AG PRO (Jan. 4, 2016), <http://www.agprofessional.com/news/gm-concerns-lead-hershey-reject-sugar-beets>.

¹⁵⁷ *USDA Increases FY 2016 U.S. Sugar Overall Allotment Quantity and Raw Cane Sugar Import Access*, USDA (May 17, 2016), <http://www.fas.usda.gov/newsroom/usda-increases-fy-2016-us-sugar-overall-allotment-quantity-and-raw-cane-sugar-import-access> (recognizing that “America’s beet sugar producers have made significant investments in a strong 2016 crop, but they continue to face uncertainty”).

¹⁵⁸ A seed platform generally refers to proprietary genetic traits that are expressed in plant agronomics, including insect resistance (Bt) and herbicide tolerance (Ht); state-of-the-art seeds containing those genetic traits, and accompanying tied chemical inputs like pesticides and fertilizers.

¹⁵⁹ Nosowitz, *supra* n. 127.

¹⁶⁰ Howard, *supra* n. 31.

¹⁶¹ Bayer and Monsanto Advancing Together, Creating Value for All, <https://www.advancingtogether.com/en/about-the-combination/creating-value-for-all/>

¹⁶² *Id.*

¹⁶³ *Id.*

creating exclusive packages of traits, seeds, and agrichemicals that are less likely to interoperate with rival products.¹⁶⁴ This kind of integration should be of concern to antitrust regulators because it squeezes out competitors, and creates enormous barriers to entry for new innovators.¹⁶⁵

Even when engineering does not locked farmers and seed distributors in, these companies have deployed their patent rights to obtain market dominance through adhesion licenses. Farmers can no longer purchase seeds outright, but are instead offered the opportunity to license seeds for a single growing season.¹⁶⁶ Among the license conditions are clauses barring seed saving¹⁶⁷ and limiting any warranties to use of associated brand-named herbicides.¹⁶⁸ These licensing restrictions are designed to create adverse incentives in order to discourage seed companies and farmers from distributing or planting anything but a single company's products.¹⁶⁹ Regulators have already found that Monsanto's use of these tactics with regard to cotton seed were an antitrust violation. In particular, regulators singled out Monsanto's use of its licensing agreements to penalize seed companies for incorporating non-Monsanto traits into their seeds, and to prohibit stacking of Monsanto and non-Monsanto traits.¹⁷⁰

C. Anticompetitive Behavior: Decreased Innovation (and Why It Matters)

Specifically focusing on the seed and agricultural chemical markets, USDA has cautioned that market concentration must be measured not only in terms of a company's share of product

¹⁶⁴ Diana L. Moss, *Mergers, innovation, and agricultural biotechnology: Putting the squeeze on growers and consumers?* Truth on The Market (March 31, 2017) <https://truthonthemarket.com/2017/03/31/mergers-innovation-and-agricultural-biotechnology/>
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¹⁶⁶ See, e.g., Monsanto 2015 Genuity Technology/Stewardship Agreement 4(f), <http://www.rispenseeds.com/Images/Monsanto.pdf>.

¹⁶⁷ *Id.* at 4(g).

¹⁶⁸ *Id.* at 4(r).

¹⁶⁹ Diana Moss, *Transgenic Seed Platforms: Competition Between a Rock and a Hard Place*, American Anti-Trust Institute (2009).

¹⁷⁰ Monsanto and DPL Merger: Public Comments, *supra* n. 87 at 18,614-18,615. 18,625.

sales, but also in that company's share of new innovations.¹⁷¹ The concern is that as agricultural markets concentrate, the Big Six will be able to maintain market share without product improvement, reducing or eliminating the incentive to invest in research and product development.¹⁷² The DOJ Guidelines recognize this problem. The Guidelines caution that mergers can adversely affect customers beyond price and choice, specifically directing regulators to consider whether a merger is likely to diminish innovation competition "by encouraging the merged firm to curtail its innovative efforts below the level that would prevail in the absence of the merger."¹⁷³ This concern about reduced innovation competition is heightened when a merger involves "combining two of a very small number of firms with the capabilities to successfully innovate in a specific direction."¹⁷⁴ European Union Competition Commissioner Margrethe Vestager also flagged this concern about the relationship between concentration and innovation saying: "We need to make sure that the proposed merger does not lead to . . . less innovation for these products."¹⁷⁵ For example, one concern the EU flagged about the Dow/DuPont merger is that it might reduce incentives to license "gene editing" technologies to competitors, and might prompt the combined company to take steps to make the development of competing technologies more difficult.¹⁷⁶ Syngenta acknowledged that EU regulators "want to make sure there is innovation competition."¹⁷⁷

¹⁷¹ Keith Fuglie et al, *Rising Concentration in Agricultural Input Industries Influences New Farm Technologies*, AMBER WAVES (December 3, 2012)<https://www.ers.usda.gov/amber-waves/2012/december/rising-concentration-in-agricultural-input-industries-influences-new-technologies/>

¹⁷² Statement of Keith Collins, Chief Economist US Department of Agriculture, Before the US Senate Committee on Appropriations Subcommittee on Agriculture, Rural Development and Related Agencies (May 17, 2001) <https://www.usda.gov/oce/newsroom/archives/testimony/2005-1997files/051701co.html>

¹⁷³ DOJ Guidance, *supra* n. 111 at 2.

¹⁷⁴ *Id.*

¹⁷⁵ European Commission, *Mergers: Commission opens in-depth investigation into proposed merger between Dow and DuPont* (August 11, 2016) http://europa.eu/rapid/press-release_IP-16-2784_en.htm (referring specifically to the Dow/DuPont merger).

¹⁷⁶ *Id.*

¹⁷⁷ Gaspard Sebag, *Dow-DuPont Shows How Innovation Is EU's New M&A Battleground*, Bloomberg (March 28, 2017) <https://www.bloomberg.com/news/articles/2017-03-28/dow-dupont-shows-how-innovation-is-eu-s-new-m-a-battleground>; Natalia Drozdiak and Jacob Bunge, *Dow-DuPont Merger Probe Hinges on Innovation Concerns* Wall St. J. (January 17, 2017) https://www.wsj.com/articles/dow-dupont-merger-probe-hinges-on-innovation-concerns-1484648516?mod=yahoo_hs.

This concern about innovation is heightened by the reality that the Big Six companies dominate global agricultural research and development.¹⁷⁸ For perspective, in 2013, the combined research and development budgets of the Big Six were 20 times greater than spending at the international crop breeding institutes operated by the Consultative Group on International Agricultural Research (CGIAR), and 15 times higher than U.S. government's (USDA/ ARS) crop science R&D spending.¹⁷⁹ Thus, slowdowns in privately funded research and development have serious repercussions for innovation in agriculture.

Testifying before the Senate Judiciary Committee, Monsanto's Chief Technology Officer spun the Bayer/Monsanto merger as a way to invest more in new technology.¹⁸⁰ Indeed, Bayer and Monsanto have characterized their merger as creating an "innovation engine" that could more quickly develop products.¹⁸¹ Their shareholder information is replete with references to innovation and statements touting the combined company's ability to engage in "R&D aimed at finding more innovative solutions for farmers."¹⁸² Similarly Dow's CEO claims that the merger will "bring together these two powerful innovation and material science leaders" in order to "apply its powerful innovation more productively."¹⁸³

By contrast, merger opponents assert that the "synergies" repeatedly claimed by the companies are actually the "elimination of parallel paths of research and development, [and] the

¹⁷⁸ Sun Ling Wang, et.al, *Public R&D, Private R&D, and U.S. Agricultural Productivity Growth: Dynamic and Long-Run Relationships*, 95 Am. J. Agric. Econ. 1287, (2013)

<https://academic.oup.com/ajae/article/95/5/1287/49220/Public-R-amp-D-Private-R-amp-D-and-U-S>; Keith O. Fuglie, Research Investment and Market Structure in the Food Processing, Agricultural Input, and Biofuel Industries Worldwide, Economic Research Service Bulletin No. 90 at 18(December 2011).

¹⁷⁹ ETC Group, *Mega-Mergers in the Global Agricultural Inputs Sector: Threats to Food Security & Climate Resilience* (September 2015) http://www.etcgroup.org/sites/www.etcgroup.org/files/files/etcgroup_agmergers_17nov2015.pptx_0.pdf.

¹⁸⁰ Chase Purdy, *Six Companies Are About to Merge Into the Biggest Farm-Business Oligopoly in History*, QUARTZ (September 20, 2016) <https://qz.com/786382/monsanto-bayer-dupont-dow-chemical-and-syngenta-defend-their-coming-oligopoly-mon-dd-dow-syt/>.

¹⁸¹ Press Release: *Bayer and Monsanto to Create a Global Leader in Agriculture* (September 14, 2016) <https://www.advancingtogether.com/en/about-the-combination/creating-value-for-all/>

¹⁸² Bayer and Monsanto Advancing Together, About the Combination, <https://www.advancingtogether.com/en/about-the-combination/creating-value-for-all/>

¹⁸³ Dow/ DuPont Press Release, *supra* n. 3.

elimination of head-to-head competition in research and development.”¹⁸⁴ As such, opponents claim these mergers will amount to a “radical contraction” in a field that already has “enormous barriers to entry.”¹⁸⁵ This concern is a real one. More than a decade ago, the USDA’s Chief economist expressed concern about continuing investment in agricultural research as markets concentrated. He noted that “product improvement may not be as necessary to maintain market share, so firms may not be as inclined to invest in research and product development.”¹⁸⁶ Experience has borne this out. Past consolidation in the industry has been directly correlated with decreasing intensity of private research spending relative to what would have occurred without consolidation, at least for corn, cotton, and soybeans.¹⁸⁷ There seems to be an inverse relationship between consolidation and innovation in the seed industry.¹⁸⁸ Experience has shown that as the industry consolidated, the remaining companies have spent less on research.¹⁸⁹

But, mergers affect innovation in an even more profound fashion than mere declines in investment. The corporations that dominate the industrial food system define the agenda for agricultural research and development. Private sector research is directed overwhelmingly to pesticides and new proprietary seeds¹⁹⁰—predominantly genetically-engineered seeds.¹⁹¹ This private sector research is not directed to issues of high public concern like food safety, genetic resource conservation, and farming practices to conserve natural resources.¹⁹² Consolidation has focused that research ever-more narrowly on a small set of commodity crops, with companies

¹⁸⁴ Lynch and Chazan, *supra* n. 98 (quoting Diana Moss of the American Antitrust Institute).

¹⁸⁵ *Id.* (quoting PeterCartensen from the University of Wisconsin).

¹⁸⁶ Statement of Keith Collins, Chief Economist US Department of Agriculture, Before the US Senate Committee on Appropriations Subcommittee on Agriculture, Rural Development and Related Agencies (May 17, 2001) <https://www.usda.gov/oce/newsroom/archives/testimony/2005-1997files/051701co.html>

¹⁸⁷ Fuglie, *supra* n. 171

¹⁸⁸ David Schimmelpennig et al., *The Impact of Seed Industry Concentration on Innovation: A Study of U.S. Biotech Market Leaders*, 30 AGRIC. ECON. 157, 158-59 (2004).

¹⁸⁹ Brad Plummer, Why Bayer’s Massive Deal to Buy Monsanto Is So Worrisome, *Vox* (September 15, 2016) <http://www.vox.com/2016/9/14/12916344/monsanto-bayer-merger>.

¹⁹⁰ Keith O. Fuglie, et al., *Research Investments and Market Structure in the Food Processing, Agricultural Input, and Biofuel Industries Worldwide: Executive Summary* 4, U.S. Dept. of Agriculture, Econ. Res. Serv. (December 2011).

¹⁹¹ *Id.* at Table 4 and accompanying text.

¹⁹² *Id.* at 10.

devoting most of their energy toward creating exclusive platforms that integrate their proprietary chemicals, seeds, and other inputs. More fundamentally, it represents an enclosure of knowledge—with research and development focused on proprietary information that does not contribute to the broader knowledge commons.

This dynamic has prompted critics to caution that the proposed mergers “will not speed up innovation” because their aim is market control.¹⁹³ Rather, consolidation of ownership over knowledge production has resulted in what ETC Group calls “the invisible hold” over the market for seeds.¹⁹⁴ As this “invisible hold” tightens, it becomes more difficult to access all kinds of information. For example, until recently, Monsanto’s technology/stewardship agreements explicitly prohibited seed purchaser from conducting any research on the seeds.¹⁹⁵ The agreements also prohibited a purchaser from supplying seeds to someone else for research purposes.¹⁹⁶ As a result, there was no way for researchers to legally acquire seeds or conduct research without the explicit permission of the company involved. Researchers complained about needing to have “written permission from the companies for any science involving their seed, even if it was commercially available.”¹⁹⁷ To obtain this permission, researchers had to get the company to sign off on the research design.¹⁹⁸ That gave the companies the power to choose who could study the crops, and to dictate how the research would be conducted, giving them unfettered power to shape the information that would available.¹⁹⁹ As a result “[n]o truly

¹⁹³ ETC Group, *Mega-Mergers in the Global Agricultural Inputs Sector: Threats to Food Security & Climate Resilience* (September 2015) http://www.etcgroup.org/sites/www.etcgroup.org/files/files/etcgroup_agmergers_17nov2015.pptx_0.pdf.

¹⁹⁴ ETC Group, *supra* n. 14 at 3.

¹⁹⁵ Emily Waltz, *Under Wraps*, 27 *NATURE BIOTECH.* 880, 880 (Oct. 2009), http://www.emilywaltz.com/Biotech_crop_research_restrictions_Oct_2009.pdf.

¹⁹⁶ *Id.*

¹⁹⁷ Nathanael Johnson, *Genetically Modified Seed Research: What’s Locked and What Isn’t*, *GRIST* (Aug. 5, 2013), <http://grist.org/food/genetically-modified-seed-research-whats-locked-and-what-isnt/>.

¹⁹⁸ In an unprecedented 2009 letter to EPA, 26 entomologists complained that the agricultural biotechnology companies were thwarting independent research on the effects of their genetically-engineered crops *See Twenty-Six Leading Corn Scientists, Comment for the FIFRA Scientific Advisory Panel*, (Feb. 22, 2009), <https://www.regulations.gov/document?D=EPA-HQ-OPP-2008-0836-0044> ; *see also* Andrew Pollack, *Crop Scientists Say Biotechnology Seed Companies are Thwarting Research*, *N.Y. TIMES* (Feb. 19, 2009), http://www.nytimes.com/2009/02/20/business/20crop.html?_r=0.

¹⁹⁹ Waltz, *supra* note 195, at 881.

independent research” could be legally conducted on many critical questions,²⁰⁰ “unduly limit[ing]” the data that regulators had before them in making decisions about genetically-engineered crops.²⁰¹

Even more astonishing than the prior restrictions on academic research is the fact that these same research limitations extended to regulators. Indeed, it was only in 2010 that Monsanto and the USDA Agricultural Research Service negotiated a license that allowed the government, the regulators overseeing Monsanto, the freedom to conduct research without first asking Monsanto’s express permission for each individual experiment.²⁰²

V. CONCLUSION

Antitrust laws in both the United States and the European Union focus regulatory attention on the market consequences of mergers, with an eye towards preventing mergers that will reduce competition. It is worth remembering that certainty about whether mergers will have an anticompetitive effect is seldom possible, and is not required for a merger to be illegal.²⁰³ With that directive in mind, it should be clear that the Dow/DuPont, Bayer/Monsanto and Syngenta/ChemChina mergers all raise serious antitrust concerns. Whether considered singly or cumulatively, the three proposed mergers will have wide-reaching impacts on competition, prices, and innovation in global and national agricultural markets. Past experience with mergers in this industry has shown that consolidation leads to increased prices, decreased choice, decreased innovation, and less access to information. Yet, it seems clear that antitrust regulators are prepared to approve all three mergers. If the Big Six indeed becomes the Big Four, it will be because regulators decided to overlook these core antitrust concerns.

Moreover, antitrust’s narrow focus on competition leaves key concerns about these agricultural mergers unexamined. In particular, there is no room in the ongoing antitrust analysis

²⁰⁰ Comment from Leading Corn Scientists, *supra* note 198.

²⁰¹ *Id.*

²⁰² Emily Waltz, *Monsanto Relaxes Restrictions on Sharing Seeds for Research*, 28 NATURE BIOTECHNOLOGY 996 (2010).

²⁰³ U.S. Dep’t of Justice & Fed. Trade Comm’n, *Horizontal Merger Guidelines* (2010), <https://www.justice.gov/sites/default/files/atr/legacy/2010/08/19/hmg-2010.pdf>.

of these proposed mergers for an examination of fundamental public policy objectives like food security and environmental sustainability.

DRAFT