

And Then There Were Four?: M&A in the Agricultural Chemicals Industry¹

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For the past several years, global production of pesticides and genetically modified seeds has been dominated by the “Big 6” (Monsanto, Bayer, BASF, DuPont, Dow, Syngenta). In 2015, the merger of Dow and DuPont was announced, which led to other mergers and acquisitions (M&A) in the agricultural chemicals sector (Bayer/ Monsanto and Syngenta/ChemChina). When completed, these announced M&As are expected to impact prices, research and development (R&D), and further consolidate an already heavily concentrated market.

Evolution of the Global Agricultural Chemical Industry: In the 1960s, there were approximately seventy pesticide manufacturers in the United States, but by the turn of the century, the field had consolidated to roughly eight major multinational manufacturers who controlled the majority of the domestic market. By 2015, the global pesticides market was commonly referred to as the ‘Big 6,’ comprising Bayer, BASF, Dow, DuPont, Monsanto, and Syngenta (table 1). The Big 6 primarily refers to the pesticides sector, but it should be noted that, when combined with the seeds sector, the Big 6 controlled nearly 70 percent of sectors by 2015 (figure 1).²

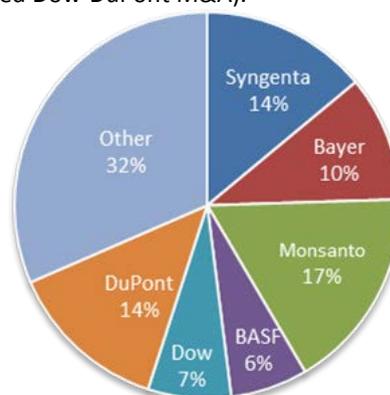
Table 1. Big 6 global market share of pesticides and seeds prior to the announced Dow-DuPont M&A in 2015.

Company	Pesticide	Seed
Syngenta	20%	8%
Bayer	18%	3%
Monsanto	8%	26%
BASF	13%	0%
Dow	10%	4%
DuPont	6%	21%
Total	75 %	62 %

Sources: Orbis, USDA, and the ETC Group

Note: Estimated sales for pesticides and seeds were \$51 billion and \$36 billion, respectively.

Figure 1. Big 6 global market share in the combined pesticides and seeds markets in 2015 (prior to announced Dow-DuPont M&A).



Sources: Orbis, USDA, and the ETC Group

Note: Figure is based off of \$88 billion in global sales.

The past several years have seen further consolidation within the major multinational producers with announced mega-mergers between the following agricultural chemical input companies: Monsanto and Bayer (estimated M&A value of \$64 million), Dow and DuPont (estimated value of \$130 million), and Syngenta and ChemChina (estimated value of \$43 million) (figure 2).

Figure 2. Timeline of recent M&A announcements and completions

May 2015: Monsanto attempts to acquire Syngenta (offer rejected)	December 2015: Dow-DuPont merger announced	February 2016: ChemChina’s announces Syngenta acquisition	May 2016: Bayer announces Monsanto acquisition	June 2017: ChemChina’s acquisition of Syngenta complete	September 2017: DowDuPont merger complete
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¹ BASF is the only major firm to be viewed as outside the latest round of M&A. DowDuPont plans to split into three independent companies (agriculture, materials science, and specialty products) by the end of 2019, and as of March 2018 the Bayer-Monsanto M&A has not been finalized.

² Current discussions concerning pesticides generally include genetically modified seeds. This is largely due to the fact that GM seeds are altered in a way to tolerate specific herbicides while also containing genes to fight off insects and pests intrinsically linking these two sectors in both manufacturing and consumption.

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These drastic consolidations over the past fifty years can largely be attributed but not limited to more profitable opportunities in the seed market and increases in biotechnology development; more stringent environmental regulatory management allowing for fewer market opportunities for agricultural chemicals; intellectual property rights (IPR) protection that made vertical integration in downstream industries more necessary.

Agricultural chemical inputs: The growing concentration of both crop seeds and biotechnology and crop protection chemicals (pesticides) highlights the costly and time consuming nature in developing new products. For example, to bring crop-protection chemicals to market in the United States, registrations average around \$300 million.³ To develop a new genetically modified (GM) seed trait, it takes an average of 13 years and costs about \$136 million.³ While the first GM seeds were not sold in the United States until 1997, GM seeds have become a highly profitable multimillion dollar industry,⁴ and such seeds can be tailored for use with specific pesticides. Consolidation within the industry not only reflects the cost and subsequent profitability associated with biotechnology advances within the field, but demonstrates the overall trend of companies' re-focusing product development towards biotechnology. This re-focusing is partially driven by cost, but also can be attributed to a number of factors, including population growth driving increases in consumer demand for agricultural products. The increase in demand coincides with difficulties in crop production associated with climate change and the development of pesticide resistance.⁵

Changing landscape: By the end of 2017, the formation of these new mega-companies led to several notable (and mandated) divestments due to antitrust requirements, which resulted in:⁶ (1) BASF's reemergence in the seed market with their purchase of Bayer's soybean, cotton, canola seeds and LibertyLink-branded crops;⁷ (2) increased presence of FMC Corporation in the agricultural chemicals market with an asset swap deal that granted them a portion of DuPont's Crop Protection business; and (3) ChemChina's ultimate approval to acquire Syngenta marking the beginning of China being considered an "agrchemical powerhouse."⁸

Is growth and development in question? Agricultural chemical inputs have entered a modern age of development driven by technological and scientific advances, but with these consolidations and already existing cross-licensing agreements, the concern of many consumers is that prices of key inputs will increase. Research by Texas A&M indicates that the Monsanto-Bayer merger alone will increase seed prices for U.S. farmers by around 2 percent for corn and soybean seeds and by 20 percent for cotton seeds.² Globally, there is also concern that development of new pesticides or seeds may be stymied due to an overall lack of incentives, stemming from the expanded portfolios and reduced competition associated with the M&A. However, despite previous waves of M&A in the agri-chemical industry, the agri-food chain seed and pesticide sectors have continued to grow and develop and this progress is expected to continue due to the ever-present consumer demand for agricultural products.

Sources: ETC Group, "[Breaking Bad: Big Ag Mega-Mergers in Play](#)," December 15, 2015; Dreibus, "[Megamergers in Ag Industry on Track, Likely Headed for Approval in 2017](#)," March 1, 2017; Fuglie *et al.*, "[Rising Concentration in Agricultural Input Industries Influences New Farm Technologies](#)," December 3, 2012; Boyd and Wever, "[Agriculture giants Bayer, Monsanto merging could ruin American farmers](#)," June 18, 2017; DuPont, "[DuPont Announces Agreement with FMC](#)" March 31, 2017; Bayer, "[Bayer signs agreement to sell selected Crop Science businesses to BASF for EUR 5.9 billion](#)" October 13, 2017; Bureau Van Dijk, *Orbis*, (accessed February 2018); Bunge, "[Syngenta-ChemChina deal gets FTC approval](#)," April 5, 2017; Howard, "[Intellectual Property and Consolidation in the Seed Industry](#)," December 2015; BASF "[BASF in exclusive talks with Bayer to acquire vegetable seeds business](#)," March 7, 2018; MacDonald, "[Mergers and Competition in Seed and Agricultural Chemical Markets](#)," *Amber Waves (USDA)*, April 3, 2017.

³ Bryant *et al.*, "[Effects of Proposed Mergers and Acquisitions Among Biotechnology Firms on Seed Prices](#)," Sept. 2016.

⁴ In 2010, the seven largest seed companies had annual sales of over \$600 million.

⁵ Bonny, "[Corporate Concentration and Technological Change in the Global Seed Industry](#)," 2017, *Sustainability*, 9, 1632.

⁶ Regulatory mandates for divestments to alleviate some consumer fears of consolidation is why some of these mergers have not been completed or are still in the process of being completed (refer to figure 2).

⁷ BASF is currently in talks to also acquire Bayer's vegetable seed business (Nunhem's® line of products).

⁸ Weinland, "[ChemChina edges closer to sealing Syngenta deal](#)," May 31, 2017, *Financial Times*.

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