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# LET THEM EAT DATA

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**ETC Group** works to address the socioeconomic and ecological issues surrounding new technologies that could have an impact on the world's poorest and most vulnerable people. It operates at the global political level and works closely with partner civil society organizations and social movements, especially in Africa, Asia and Latin America.

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- 1 International Panel of Experts on Sustainable Food Systems (IPES-Food). *Too Big to Feed: Exploring the Impacts of mega-mergers, consolidation and concentration of power in the agri-food sector*. IPES-Food: Thematic Report 3, 2017. Available at: [www.ipes-food.org/Concentration](http://www.ipes-food.org/Concentration).
- 2 Mayet, Mariam and Greenberg, Stephen. “The Three Agribusiness Mega-mergers: Grim Reapers of Farmers’ Sovereignty”. *Right to Food and Nutrition Watch* (2017): 70-78. Available at: [www.righttofoodandnutrition.org](http://www.righttofoodandnutrition.org).
- 3 IPES-Food. *Supra* note 1.
- 4 Advances in big data are making waves along the entire food value chain, from dematerialization of genetic information in seed and livestock breeding to agrochemicals and fertilizers; converging sensors, robotics and weather/market data in farm machinery; and big data-enabled market information in the commodity trade, transport and retail sectors. However, this article will only focus on the farm machinery sector.

The EU, US and other competition authorities are greenlighting more than a quarter trillion US dollars in agribusiness mega-mergers.<sup>1</sup> In last year’s edition of the *Right to Food and Nutrition Watch*, Mariam Mayet and Stephen Greenberg warned that if the current three agribusiness mega-mergers on the table went through, farmers’ sovereignty and the human right to adequate food and nutrition would suffer.<sup>2</sup> At the time of writing (early 2018), it is looking like all three will be approved and the three merged companies (Bayer-Monsanto, Dow-Dupont – now Corteva, and ChemChina-Syngenta) will control two thirds of seed and agrochemical markets,<sup>3</sup> increasing the power of corporations to dictate input prices and farmers’ choices.

However, some fundamental shifts are also underway down on the industrial farm. Both agro-input and farm machinery companies are investing heavily in ‘precision agriculture’, a vision of extreme mechanization in agricultural production, enabled by the convergence of powerful new digital technologies and algorithmic processing of big data.<sup>4</sup> These technological advances and fights over the first round of mega-mergers in the agro-input sector foreshadow a second wave of consolidation that is not only about seeds or chemicals, but also about data. While the attention right now is on agro-input mergers, the moment is fast approaching when machinery companies and data platforms will set the future of industrial agriculture.

Precision agriculture – also called data-driven or digital agriculture – understands food production as an ‘optimization problem’, in Silicon Valley terms.<sup>5</sup> Weather records, soil moisture, pests, and crop history are turned into datasets and run through machine-learning algorithms that then inform automated farming machinery. A new wave of self-driving tractors, agricultural robots and aerial drones

coordinate with data from satellites, sensors and scouting drones that compute real-time information at as small a scale as five square centimeters,<sup>6</sup> and can determine where and when to apply seed, fertilizer, fungicide and pesticide to maximize yield while building proprietary datasets of farming information. In glossy presentations of precision agriculture, a modern farmer sips coffee, staring not at their field but at soil maps on an iPad as the bots and drones tend to the farm.

It may seem unconceivable, but agribusiness has been anticipating this technological change for some years and all major agricultural input enterprises are heavily investing in data-dependent precision agriculture technologies. Monsanto's almost 1-billion-dollar acquisition of Climate Corporation in 2013 marked a watershed moment, but in fact Deere & Co. (Deere) and others had already been outfitting their tractors with precision GPS for some time, as well as other computerized work systems. When, in September 2017, Deere announced it would acquire Blue River Technology – a company further outfitting tractors with cameras and computers using artificial intelligence to scan fields and identify weeds – Monsanto Growth Ventures (MGV) Investment Director speculated on its significance: “We can now see a legitimate path to a utopian time-not-too-far-away, where ‘see and spray’ fungicides, microbes, and, of course, weeding combinations of selective and non-selective herbicides, can be used to tend each plant individually.”<sup>7</sup>

#### A NEW WAVE OF MERGERS IS CRESTING

The impulse of the agri-giants towards this new mechanization of the farm means that a second wave of mergers between agro-inputs and farm machinery is now almost certain. Monsanto, for example, is aggressively reformatting itself as data-robot-tech company in addition to biotechnology and conventional seed market. MGV has invested in digital agriculture companies like Blue River Technology; AgSolver, a US company that develops software and analytic systems for land management, valuation, and business planning; Vital Fields, an Estonian company that provides farm analytics for European farmers; and HydroBio, a US company that provides prescription irrigation recommendations. In 2015, Bayer bought Zoner, a Canadian company that analyzes satellite and aerial imagery and data on yield and soil electrical conductivity and provides real-time, field-level weather information.<sup>8</sup> In 2016, Bayer also acquired proPlant, a German firm that provides a system for plant health diagnosis, and partnered with Planetary Resources, a company with hyperspectral sensing technologies that sense soil moisture and temperature from satellite data.<sup>9</sup> Industry reports asserted that Monsanto's digital agriculture subsidiary Climate Corporation sealed Bayer's interest in acquiring Monsanto in this round of mergers.<sup>10</sup> Since Bayer and Monsanto signed their merger agreement, Climate Corporation has bought up precision agriculture start-ups with technologies for farm analytics, soil analysis, GPS-based information systems for plants and machinery and data analysis for irrigation.

On the other hand, farm machinery companies already own the machines and hardware that spread the seeds, pesticides, fertilizers and water, and that harvest the crop. Even more than the agro-input companies, it's the machinery companies who have the deep pockets to capture 'digital agriculture'. The global farm machinery market is valued at nearly \$114 billion (compared to US \$40.5 billion market for seeds and US \$56.1 billion market for agrochemicals<sup>11</sup>) and the three biggest farm machinery companies – Deere (USA), CNH Industrial (Netherlands) and Kubota (Japan) – accounted for approximately half of total sales in 2014.<sup>12</sup> Like the agro-input

5 Thomas, Jim. “How corporate giants are automating the farm”. *New Internationalist*, November 1, 2017. Available at: [newint.org/agriculture-robots](http://newint.org/agriculture-robots).

6 McCabe, Matthew, Houborg, Rasmus, and Lucieer, Arko. “High-resolution sensing for precision agriculture: from Earth-observing satellites to unmanned aerial vehicles”. Paper Presented at Remote sensing for Agriculture, Ecosystems and Hydrology XVIII, 2016. Available at: [repository.kaust.edu.sa/kaust/bitstream/10754/622870/1/999811.pdf](http://repository.kaust.edu.sa/kaust/bitstream/10754/622870/1/999811.pdf).

7 Stead, Kiersten. “Blue River Technology's Journey to Acquisition”. *LinkedIn Blogpost*, September 8, 2017. Available at: [www.linkedin.com/pulse/blue-river-technology-journey-acquisition-kiersten-stead/](http://www.linkedin.com/pulse/blue-river-technology-journey-acquisition-kiersten-stead/).

8 For more information, please visit: [zoner.bayer.com](http://zoner.bayer.com).

9 Burwood-Taylor, Louisa. “Bayer Adds to Digital Farming Business with Planetary Resources Partnership as Startup Raises \$21m Series A”. *AgFunder News*, June 2, 2016. Available at: [agfundernews.com](http://agfundernews.com).

10 Cowan, Emma. “The Race to Consolidation: Why Bayer is Backing the GMO Horse”. *Agfunder News*, June 2, 2016. Available at: [agfundernews.com](http://agfundernews.com).

11 IPES-Food. *Supra* note 1.

12 ETC Group. "Breaking Bad: Big Ag Mega-Mergers in Play Dow + Dupont in the Pocket? Next: Monsanto?". *ETC Communiqué* n°115 (December 2015). Available at: [www.etcgroup.org/content/breaking-bad-big-ag-mega-mergers-play](http://www.etcgroup.org/content/breaking-bad-big-ag-mega-mergers-play).

13 IPES-Food. *Supra* note 1.

14 For more information on these ventures, please see: ETC Group. *Software vs. Hardware vs. Nowhere: Deere & Co. is becoming 'Monsanto in a Box'*. December 2016. Available at: [www.etcgroup.org/content/deere-co-becoming-monsanto-box](http://www.etcgroup.org/content/deere-co-becoming-monsanto-box).

15 Monsanto. *New Agriculture Breakthroughs Poised to Support Farmers, Support Demands of a Growing Population*. 2016. Available at: [www.onsanto.com/new-agriculture-breakthroughs-poised-to-support-farmers](http://www.onsanto.com/new-agriculture-breakthroughs-poised-to-support-farmers).

16 Plume, Karl. "Monsanto scraps deals to sell Precision Planting to Deere". Reuters, May 1, 2017. Available at: [www.reuters.com/Monsanto-scraps-deal-Deere](http://www.reuters.com/Monsanto-scraps-deal-Deere).

17 Monsanto. "AGCO to Acquire Precision Planting from The Climate Corporation". *Monsanto Press Release*, July 26, 2017. Available at: [climate.com/newsroom/agco-to-acquire-precision-planting-from-the-climate-corporation/76](http://climate.com/newsroom/agco-to-acquire-precision-planting-from-the-climate-corporation/76).

18 Little, Amanda. "This Army of AI Robots Will Feed the World". *Bloomberg Businessweek*, January 11, 2018. Available at: [www.bloomberg.com/news/features/2018-01-11/this-army-of-ai-robots-will-feed-the-world](http://www.bloomberg.com/news/features/2018-01-11/this-army-of-ai-robots-will-feed-the-world).

19 ETC Group. "Who Will Feed Us?". 2017. Available at: [www.etcgroup.org/whowillfeedus](http://www.etcgroup.org/whowillfeedus).

companies, they have been investing in the big data essentials like weather and market information for years and are combining this with precise field sensors and information about both seeding and harvests.<sup>13</sup> They have also been acquiring precision agriculture start-ups and entering joint ventures with the leading agro-input companies. For example, Deere has partnered with Syngenta (2007) on the *Force CS* insecticide delivery system; with DuPont-Pioneer (2013) linking Pioneer's precision agronomy software with Deere's hardware; as well as with Dow Agrosiences (2013) and BASF (2013) on data-sharing and Bayer CropScience (2014) on developing digital tools. CNH Industrial and AGCO (another farm machinery company) have also entered joint ventures around precision agriculture with big six companies.<sup>14</sup> Most notably, in 2015 Deere announced that it intended to acquire Precision Planting LLC, a Monsanto-owned precision agriculture equipment firm and announced a second agreement with Monsanto's Climate Corporation that allowed some of its equipment to wirelessly connect with Monsanto's Climate Fieldview platform.<sup>15</sup> In 2017, the Brazilian government and US Department of Justice blocked Deere's acquisition of Precision Planting LLC on grounds that it would give Deere a monopoly on precision farming technology.<sup>16</sup> In July 2017, AGCO announced that it would acquire Precision Planting LLC<sup>17</sup> and Deere made an offer on Blue River, another Monsanto subsidiary with the same technologies.

The machinery sector has the financial clout and proprietary weather and market data to take on the newly merged input entities. Regardless of who comes out on top, if the second wave of mergers goes through, the resulting companies will have oligopolistic control over the first half of the industrial food chain and almost half a trillion dollars in annual input sales.

#### HOW WILL THIS IMPACT THE RIGHT TO FOOD AND NUTRITION?

The right to food and nutrition and struggles for food sovereignty stand to lose a lot in a world of mega-mergers. The following are some of the main impacts:

- **Reducing choices for farmers:** As industry insiders have observed: "Deere's ability to make farmers dependent on the usage and, increasingly, the maintenance of its specialized equipment bears relation to Monsanto's system of locking farmers into its herbicides and seeds."<sup>18</sup> Conceding even greater power to Deere & Co. and Monsanto is a giant step away from food sovereignty, reducing farmers' choices and raising input prices, and limiting their ability to repair or maintain their own machinery.
- **Industrial farming creeps onto 'marginal' lands:** For now, the target audience of precision agriculture is large-scale Northern farmers. But small farmers in the Global South are also in the crosshairs. The precision and adaptability of these new tools may allow industrial monocultures to operate on so-called marginal lands, where peasant farming families, often women-led, produce 70% of the food that feeds the world.<sup>19</sup> The Bill & Melinda Gates Foundation, for example, is actively exploring the potential for precision agriculture to mechanize and incorporate big data driven farming models onto small farms. If history repeats, precision agriculture technologies in the hands of agribusiness may serve as a tool for land grabbing. As Jim Thomas writes: "If a drone can map it and a robot can farm it, why would an ag corporation not move the peasants off the land, seize their soil and bring in the agbots – massively extending the global land grab one data-driven, precision-farmed centimeter at a time."<sup>20</sup>

- **People-less farming:** Implicit in the vision of precision agriculture is a people-less farm managed through apps that may not even require their manager to be physically on site. The people who stand to lose in this equation are the 50 million farm workers employed by industrial agriculture whose jobs are at risk,<sup>21</sup> and smallholder farmers.<sup>22</sup>
- **Degenerative organic?** The precision agriculture discourse has also raised new debates and widened rifts in the food movement. Advocates of precision agriculture claim that it will drastically reduce chemical use in industrial agriculture because they are applied in smaller, targeted amounts – perhaps even meeting requirements for organic agriculture. Companies with organic lines such as Driscoll’s berries are already exploring deploying robotic pickers and weeders into the fields in place of farm labor, claiming this will drive down the cost of ‘sustainable’ agriculture. And precision farming systems can theoretically be set to just-about meet technical organic standards without deeply improving the health of soil and building resilience to climate change.

20 Thomas, Jim. 2017. “How corporate giants are automating the farm”. *New Internationalist*, November 1, 2017. Available at: [www.etcgroup.org/whowillfeedus](http://www.etcgroup.org/whowillfeedus).

21 ETC Group. *Supra* note 19.

22 Pimbert, Michel. “Towards Food Sovereignty: Reclaiming autonomous food systems”. *International Institute for Environment and Development* 141 (2009): 8.

### **SUPPORTING AND STRENGTHENING FOOD SOVEREIGNTY AND AGROECOLOGY MOVEMENTS**

We will not realize the right to food and nutrition by deepening and strengthening industrial food practices – the time has never been more urgent to assert that peasant farmers, especially women, are the keystones to addressing hunger, malnutrition and ensuring the right to food. We must reaffirm our commitment to food sovereignty: supporting and strengthening the rural social movements who have been demanding agrarian reform and right to territories; restoring farmers’ right to save, plant, exchange, breed and sell seeds and livestock; removing regulations that block local markets; reorienting public research and development toward the public good, instead of private interest; addressing iniquitous trade policies; and establish and ensuring fair wages and working conditions for food and agricultural workers. All of these are directly threatened by the deployments of precision agriculture and its concomitant consolidation of power.

At the international and national scale, civil society must fight the mergers and demand that governments dismantle the power of agribusiness – that will require political will, and effective tools. Globally, civil society groups and a few Southern governments are advocating for a United Nations Treaty on Competition to keep corporations in check and incorporate environmental and socio-economic aspects into evaluations.<sup>23</sup> The newly-formed UN Forum on Science, Technology and Innovation and its Technology Facilitation Mechanism have seen debate on the need for the UN to address corporate concentration and technology monopoly. Meanwhile, the UN Committee on World Food Security in Rome worked to take up the seed and pesticide mergers as an urgent issue of Food Security in 2016 and 2017 – and will have even more demand to address the issue in 2018. As civil society learns from the current wave of agro-input mergers, it’s not too early to build the movement to stop the data-driven sequel of mergers.

23 ETC Group. “Europe bows to Bayer-Monsanto... US may follow”. *News Release*, March 20, 2018. Available at: [www.etcgroup.org/content/news-release-four-farm-europe-and-us-regulators-may-bow-bayer-monsanto-and-basf](http://www.etcgroup.org/content/news-release-four-farm-europe-and-us-regulators-may-bow-bayer-monsanto-and-basf).



### IN BRIEF

As the ‘mega-mergers from hell’ that have rocked the input sector since 2015 are wrapped up (Bayer-Monsanto looking likely to be approved by the US at the time of writing), advances in big data, robotics and remote sensing, under the umbrella of ‘precision agriculture’, are likely to drive a new wave of mega-mergers in the food system, this time between agro-input and farm machinery companies. This article shows how both agro-input and farm machinery companies are buying up precision agriculture start-ups and entering joint ventures to share their data, software and hardware. If the second wave of mergers goes through, the resulting few companies will have oligopolistic control over the first half of the industrial food chain and almost half a trillion dollars of annual inputs sales. This will reduce choices and raise input prices for farmers; give industrial agriculture the tools and ability to operate on marginal lands that are currently home to many of the world’s peasant and family farmers; threaten millions of workers and small-holder farmers while achieving its vision of ‘people-less’ farming; and muddy the waters of ‘sustainable’ agriculture, making it easier for industrial farmers to meet organic standards without building soils or resilience. To protect the right to adequate food and nutrition, we must reaffirm our commitment to peasant-led agroecology and food sovereignty and push for a UN Treaty on Competition that will empower governments to keep corporations in check.



### KEY CONCEPTS

- Agriculture companies are moving toward big-data enabled precision agriculture – a vision of extreme mechanization and automation on the farm.
- After first wave of mega-mergers, four companies control 60% of agrochemicals market – another round of mergers between agrochemicals and farm machinery companies is likely.
- If the new wave of mergers go through, the resulting companies will have oligopolistic control over nearly half a trillion dollar input industry.
- We must reaffirm commitment to food sovereignty and push for a UN Treaty on Competition that would evaluate corporate mergers on environmental and socio-economic grounds.



### KEY WORDS

- Precision agriculture
- Mega-mergers
- Corporate consolidation
- Food sovereignty
- Corporate governance