JOHN DEERE'S ATTEMPTED MONOPOLIZATION OF EQUIPMENT REPAIR, AND THE DIGITAL AGRICULTURAL DATA MARKET – WHO WILL STAND UP FOR AMERICAN FARMERS?





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I. INTRODUCTION

Deere & Company ("Deere"), better known as "John Deere," is the leading manufacturer in the North American agricultural equipment market, with market shares of approximately 53 percent of large farm tractors in North America, and 60 percent in the combine segment.² Recently, Deere sent shock waves through the American farming community when it announced a new policy with the effect of locking farmers out of the software used in Deere equipment. Deere's lockout policy prevents farmers from repairing and maintaining their own machines, as they have done for decades.

This article briefly discusses how Deere's repair policy may violate antitrust and consumer protection laws, before turning to a discussion of the potential impact of Deere's policy on digital farming. Deere asserts that it owns data gathered from its machines' software. We discuss how Deere may be attempting to monopolize the growing digital agriculture market by collecting, controlling and amalgamating farm data from its equipment's software. We further discuss how Deere may be conspiring to monopolize digital farming markets through its partnerships with companies such as Bayer/Monsanto, DowDupont, and BASF.

II. DEERE'S REPAIR POLICY

For centuries, American farmers, like their counterparts throughout the world, have frequently repaired their own agricultural equipment and machinery, or taken it to local shops for repair.³ Unfortunately, Deere is seeking to change this. Deere is the leading supplier of agricultural machinery in the United States, with an approximate North American market share of 53 percent for large tractors and 60 percent for combines.⁴ Deere has begun installing software in its equipment (the "Service Advisor" system) that prevents farmers from running equipment unless and until they have the equipment repaired by a licensed Deere service representative.⁵ This

2 Jennifer Reibel, *Manufacturer Consolidation Reshaping the Farm Equipment Market-place*, Data & Forecasts, Manufacturing News 5, 11 (Aug. 29, 2018). The industry is largely a duopoly with CNH Industrial controlling 35 percent of the large farm tractors' share, and 30 percent of the share of combines. The third player, AGCO, controls 7 percent of both the large tractor and combine markets. This is clearly a highly concentrated industry with HHIs in excess of 4100 for the North American large tractor market, and approximately 4600 for the combine market.

3 See, e.g. Kyle Wiens & Elizabeth Chamberlain, *John Deere Just Swindled Farmers Out of Their Right to Repair*, WIRED (Dec. 11, 2019) (observing that "[t]he ability to maintain their own equipment is a big deal to farmers. When it's harvest time and the combine goes kaput, they can't wait for several days for John Deere to send out a repair technician. Plus, farmers are a pretty handy group. They've been fixing their own equipment forever").

4 Reibel, supra note 2, at 11.

5 See, e.g. Olivia Solon, *A Right to Repair: Why Nebraska Farmers Are Taking on John Deere and Apple*, THE GUARDIAN (Mar. 6, 2017) (discussing how "[f]armers like fixing their own equipment, but rules imposed by big corporations [like John Deere] are making it impossible."); and Wiens & Chamberlain, *supra* note 3 (observing that John Deere customers have no "right to purchase repair parts without going through a dealer. Farmers can't change engine settings, can't retrofit old equipment with new features, and can't modify tractors to meet new environmental standards on their own").

policy effectively prevents farmers from performing repairs or maintenance on Deere equipment themselves, or from having a local third-party service provider repair that equipment for them.

By way of background, Deere's products have computerized controllers that are wired into their "can bus" systems.⁷ Problems with Deere products are diagnosed through software error codes. Many of these error codes are purely software-based. Often, it is safe to operate the equipment even with an error code. Now, however, an error code turns on an alarm in the cab, along with a prominent "STOP" symbol. ⁸ The software shuts down the machine, and keeps it from operating until the error code is addressed. ⁹ This system effectively prevents farmers from fixing their own Deere equipment or performing maintenance themselves. It also effectively prevents them from having a local third-party repair shop or technician repair the Deere equipment for them without Deere's assistance. ¹⁰

Deere likely will argue that its repair policy follows a growing trend in the agriculture industry to offer integrated solutions that are efficiency-enhancing and pro-consumer. Deere's new restrictions ostensibly parallel the recent efforts by Bayer/Monsanto to prevent farmers from replanting last year's seeds and from using different companies' crop protection systems. ¹¹ American Antitrust Institute President Dr. Diana Moss notes: "Economic evidence from soybeans and cotton indicates that seed prices under vertical integration tend to be higher than under licensing arrangements across firms." ¹² Dr. Moss adds that "[i]ntegration enhances both the ability and incentive to bundle proprietary systems that do not interoperate with rival technologies." ¹³ Deere's repair policy creates similar vertical integration in the agricultural equipment industry that will possibly generate higher repair prices, greater waiting times, and reduced choices for farmers.

Deere likely will also argue that it is protecting farmers' agricultural equipment by ensuring that only trained, qualified, and licensed repair providers work on the equipment. Something less benign, however, may be occurring.

Deere's requirement that farmers solely use Deere's repair services appears to be a tying arrangement that may violate Sections 1 and 2 of the Sherman Act, Section 3 of the Clayton Act¹⁴ and Section 5 of the FTC Act, as well as various state consumer protections statutes. On its face, Deere's tying arrangement may implicate antitrust scrutiny because "[r]epair is a huge business. And repair monopolies are profitable." Deere now effectively prevents farmers from repairing their own equipment, or from going to a local repair shop, as farmers have been doing since Deere was founded in 1837.

6 See Solon, *supra* note 5. Solon observes: "Because farm machinery is so high-tech, the only way to silence the error message is by plugging in a special diagnostic tool – essentially a computer loaded with troubleshooting software that connects to a port inside the tractor -- to identify and resolve the problem. Only [John Deere] and authorized dealers are allowed that tool, and they charge hundreds of dollars to use it. For a fifth-generation farmer in an increasingly squeezed market, whose family has spent decades fixing the equipment they paid for, it's a tough pill to swallow"). *Id.*

7 Starting around the year 2000, all Deere equipment began using "can bus" systems in their machinery. A can bus is essentially a central electrical system that allows communications between different parts of the machinery. This allows repair technicians to plug in diagnostic tools to diagnose an issue with the machinery, which further cuts down on the amount of wiring necessary inside the machine. See John Deere & Co Sales Manual, Electrical, CAN bus electrical system (2011), available at http://salesmanual.deere.com/sales/salesmanual/en_NA/tractors/2011/feature/electrical_and_lights/6030p_7030p/6030_7030_can_bus_story.html.

8 As Nebraska farmer Kyle Schwarting recently observed: "I can't turn the alarm off. If I had the literature and capability to diagnose and fix it, it would already be done. I changed the mechanical switch and wire, but now I'm down to the programming." Solon, *supra* note 5.

9 *ld*.

10 See, e.g. Note, Fix Me: Copyright, Antitrust, and the Restriction on Independent Repairs, 52 U.C. Davis L. Rev. 1701, 1717 (2019), citing Limited Warranty for New John Deere Turf & Utility Equipment (Oct. 1, 2018), available at https://www.deere.com/assets/pdfs/common/parts-and-service/warranty-protection-plans/warrantyus.pdf.

11 See, e.g. Diana Moss, Consolidation and Concentration in Agricultural biotechnology: Next Generation Competition Issues, CPI Agricultures AND ANTITRUST CHRONICLE (Dec. 2019). As one farmer noted: "I can't mix chemicals with other companies' products to remedy Roundup resistance" Id. See also Daniel Oliver, Farming is Going Digital. Can Antitrust Law Keep Up? https://www.washingtonexaminer.com/farming-is-going-digital-can-antitrust-law-keep-up at 1. "Seeds today are engineered to grow in particular soils and climates, and increasingly to perform in conjunction with specific crop protection products." (emphasis in original). Id.

12 Moss, *supra* note 11. Dr. Moss adds: "This suggests that vertical integration may increase the exercise of market power and firms' ability to extract economic benefits from seed dealers and farmers." *Id.*

13 Id. Dr. Moss explains how this can raise entry barriers by effectively blocking potential new entrants from coming into the market. Id.

14 Although Section 3 of the Clayton Act does not apply to services, Deere's tying arrangement effectively means that farmers will have to use Deere's repair parts, since Deere's licensed technicians are likely (and most likely required) to use Deere parts in repairing Deere equipment.

15 Although Section 3 of the Clayton Act does not apply to services.

This paper's focus, however, is not Deere's repair tie-in and Deere's potential attempted monopolization of its repair services, which are generating tremendous economic harm and frustration throughout the farming world. Instead, this article focuses on a less highlighted, but also heavily concerning aspect of Deere's Service Advisor software system: Deere's potential attempt to utilize its equipment software to monopolize the exploding market of digital farming.¹⁶

The integrated software and computers in Deere's agricultural equipment allow Deere to track famers' activities while they use Deere equipment. The amount of digital information that can be tracked via a Deere tractor, combine, or any other piece of Deere farm equipment is expansive. For key agricultural equipment such as tractors and combines, Deere is in a perfect position to gather, control, amalgamate, and monopolize large swaths of detailed farm-by-farm digital agricultural data that it can then sell or license to other agricultural giants. Indeed, "[s] eed and chemical companies like Bayer[/Monsanto], DowDupont, and BASF" already have entered into partnerships with Deere 'to gather farm level data from their tractors and host their software on Deere's farm equipment." Such partnerships among the large agricultural companies may seriously jeopardize future entry, innovation, and competition in this crucial burgeoning market. Perhaps that is why "Big Ag has been so reluctant to make any concessions in the growing right to repair business." 18

III. DEERE'S POTENTIAL ATTEMPTED MONOPOLIZATION AND RESTRAINT OF TRADE

A farmer purchasing a Deere tractor or combine reasonably expects that he or she becomes the owner of their equipment and any digital farming data their machinery generates. Deere customer Jeff Buckingham of San Luis Obispo, California noted: "At the end of the day, I bought this equipment, and I want everything I need to keep it running without relying on the manufacturer or dealer." Unfortunately, Deere disagrees. Deere recently has gone so far as to argue that when a farmer "purchases" a Deere tractor or combine, the farmer is merely receiving a "license to operate the vehicle."

17 Claire Kelloway, Data consolidation Threatens Sustainable Agriculture Says International Panel, Food & Power [Орем Маккетs Імятите] (February 15, 2019).

18 Solon, supra note 5.

19 *ld*.

20 *Id.* Solon adds that Deere "lock[s] users into license agreements that forbid them from even looking at the software running the tractor or the signals it generates." *Id.* See also Darin Bartholomew's Long Comment Regarding a Proposed Exemption, 17 U.S.C.§1201, U.S. Copyright Office (2014). In this comment, a John Deere attorney argues:

In the absence of an express written license in conjunction with purchase of the vehicle, the vehicle owner receives an implied license for the life of the vehicle to operate the vehicle, subject to any warranty limitations, disclaimers or other contractual limitations in the sales contract or documentation.

Id. Interestingly, Deere's position is similar to Tesla's position concerning its automobiles. As observed by Tesla's founder Elon Musk: "Tesla is a software company, as much as it is a hardware company ... We view this the same as updating your laptop." Jerry Hirsch, Elon Musk: Model S not a car but a 'sophisticated computer on wheels," L.A. TIMES (Mar. 19, 2015) (quoting Elon Musk).

¹⁶ Deere's tying arrangement effectively means that farmers will have to use Deere's repair parts, since Deere's licensed technicians are likely (and most likely required) to use Deere parts in repairing Deere equipment. Analyzing data to maximize their yields and reduce the need for agricultural inputs and natural resources."); *EU Antitrust Chief says* "Beware" of Bayer-Monsanto Control of Farm Data, Food & Power Newsletter (Oct. 14, 2019) (observing that "digitalization is radically changing farming"); Creating a Global Leader in Agriculture (Sept. 14, 2016), at 20, available at https://www.investor.bayer.de/en/handouts/archive-investor-handouts/ (describing digital farming as the use of "[e] xtensive data collection and computation" and "[p]redictive analytics" to provide digital insights to optimize farmers' decision-making"); and Moss, supra note 11 at ("Digital farming is one of the most innovative areas at the intersection of agriculture and big data. The field of companies that specialize in agricultural data analytics and intelligence has expanded over the last decade.").

Deere's position would seem to be *per se* illegal under the 1976 Copyright Act, which allows individuals to copy software in order to repair an item, so long as they destroy the copy when their repairs are finished.²¹

Deere, however, has joined with companies such as Apple in taking the position that the 1998 Digital Millennium Copyright Act ("DMCA") overrides the 1976 Copyright Act. Deere believes that the DMCA allows it to legally place software locks on their equipment, and that 17 U.S.C. §1201(a) makes circumventing such software protections illegal under federal law.²²

Apart from attempting to monopolize the repair and maintenance of its equipment, why might Deere institute such scheme? The potential answer is that Deere is playing for higher stakes. Deere could have its eyes set on a monopoly beyond the repair of its agricultural equipment. Could it be that Deere is attempting to monopolize the digital farming information market? And conspiring with companies such as Bayer/Monsanto, DowDupont, and BASF in leveraging a shared monopoly?

IV. INFORMATION TRACKING

In Deere agricultural equipment, different components have distinct "controllers" that are wired to the internal "can bus" system. Each controller stores information specific to the function that that controller manages.

For example, in a Deere tractor, there are multiple pieces of data that are tracked and logged, and this occurs simply through the act of driving the tractor. For example, the location of the tractor is tracked using a GPS system.²³ The number of hours that the machine has been operated is also tracked.²⁴ In addition, the controllers can sense what other implements or attachments are connected to the tractor.²⁵ The computer can also track and log machine-by-machine information such as its ground speed. The tractor's entire error code history is logged by the software in the machine, as well as the history of the machine's software and firmware.²⁶

In and of itself, the data collected from a single tractor may not be all that valuable. However, when combined with data received by controllers about the attachments that are used in conjunction with the tractor, the information can become very valuable. For example, controllers can log the rate of use for sprayers and fertilizer applicators, which shows how much of each chemical or liquid fertilizer the farmer is using on any given field. Seeding rates on planters and air seeders can also be tracked and logged via the controllers. This information, paired with the tracked location of the tractor, could be incredibly valuable to a seed or chemical company that is trying to market their products to farmers.

Furthermore, tractors are not the only Deere machines being tracked. There are just as many, if not more, controllers located on Deere combines. For example, Deere combines have sensors that track and log the moisture levels of the harvested product and the yield that any

21 See 17 U.S.C. §101, et seq (2019). Section 117 of the Act reads in relevant part: (c) Machine maintenance or repair. Notwithstanding the provisions of section 106 [17 USCS § 106], it is not an infringement for the owner or lessee of a machine to make or authorize the making of a copy of a computer program if such copy is made solely by virtue of the activation of a machine that lawfully contains an authorized copy of the computer program, for purposes only of maintenance or repair of that machine, if —

- (1) Such new copy is used in no other manner and is destroyed immediately after the maintenance or repair is completed; and
- (2) With respect to any computer program or part thereof that is not necessary for that machine to be activated, such program or part thereof is not accessed or used other than to make such new copy by virtue of the activation of the machine.

See also Daniel Moore, You Gotta Fight for Your Right to Repair: The Digital Millenium Copyright Act's Effect on Right-to-Repair Legislation, 6 Tex. A&M L. Rev. 509, 511-512 (2019).

22 See 17 U.S.C. §1201, et seq; and Note, Fix Me: Copyright, Antitrust, and the Restriction on Independent Repairs, U.C. Davis L. Rev. 1701, 1710 (2019). To hear the story of one Nebraska farmer who has openly admitted that he downloaded eastern European software onto his personal computer to override Deere's software lock, see https://www.youtube.com/watch?v=F8VCOowT4w.

23 Privacy & Data, John Deere (May 15, 2018), https://www.deere.com/en/privacy-and-data/.

24 Id.

25 Id.

26 Id.

particular field produces.²⁷ This information is extremely valuable to seed companies.²⁸ Indeed, it does not take much²⁹ imagination to see how valuable such individual and amalgamated digital data is to the "Big 3" agricultural oligopolists.³⁰ As noted by Claire Kelloway:

The problem is not that a growing number of farmers rely on data-analytics to guide their planting decisions. It's that large swaths of valuable data are increasingly being locked away inside the servers of private for-profit corporations, rather than made public by open and disinterested sources that historically informed farmers, like the U.S. Department of Agriculture and university extension services.³¹

Executive Director of the Organization for Competitive Markets Joe Maxwell adds: "If they own the data, then they can dictate what [farmers] plant, where they plant it, and how they're harvested." 32

While farmers assert their right to repair their Deere agricultural equipment, Deere, in the meantime, is influencing the current movement by agribusinesses "to corner access to all types of agricultural data and create their own ag-tech platforms." Indeed, "[s]eed and chemical companies like Bayer, DowDupont, and BASF have [already entered into] partnerships with Deere to gather farm-level data from their tractors and host their software on Deere's farm equipment" Farmers today, it seems, are becoming uncompensated data gatherers for Deere and its partners.

Attempts to monopolize under Section 2 of the Sherman Act generally require proof of: (1) anticompetitive or predatory acts by the defendant; (2) a specific intent to monopolize; and (3) a dangerous probability of success.³⁵ Deere's assertion that it owns the sole right to all of the digital agricultural information and data generated by farmers using equipment that farmers have purchased would appear to constitute a potentially anticompetitive act. What possible increase in "consumer welfare" could arise from Deere's assertion that farmers do not have the right to the agricultural data farmers generate on their own farms using their own farming machinery? In effect, by nature of Deere equipment comprising approximately 53 percent of the large North American tractor market and 60 percent of the North American combine market, Deere has asserted that it is entitled to sole ownership and the right to use or sell a substantial majority of all of the information American farmers generate using their own equipment on their own farms.³⁶

Deere's assertion of its sole proprietary rights to farmers' highly detailed and confidential agricultural data shows a potential intent to monopolize. In effect, Deere is asserting that it has the right to control, amalgamate, and exclusively sell the majority of key digital agricultural data from individual farms throughout the United States. What could be more anticompetitive or exclusionary than excluding the buyers and owners of

27 See Moss, *supra* note 11 ("Farming data is quickly becoming a critical input for the Big 3"). See also Isabelle M. Carbonell, *The Ethics of Big Data in Big Agriculture, 5 INTERNET POLICY REVIEW 2* (Mar. 31, 2016); and *Dupont Acquires Ag Software Company Granular to Accelerate Digital Ag Strategy and Help Farmers Operate More Profitable Businesses*, DuPont (Aug. 8, 2017).

28 Moss, *supra* note 11.

29 Id.

30 *ld*.

31 Kelloway, *supra* note 17, at 2. University of Wisconsin Law Professor Peter Carstensen similarly observes that "[t]he fundamental problem is having these guys [the Big Ag companies], as the source of all kinds of planting and other information." *Id.* (quoting Prof. Carstensen). Professor Carstensen adds that the corporations could use their data control to steer farmers toward their particular seeds, crops, and pesticides. *Id.*

32 Id. (quoting Joe Maxwell).

33 Id.

34 Id.

35 See, e.g. ABA Section of Antitrust Law, Antitrust Law Developments 324 (8th ed. 2017).

36 Deere's stunning agricultural data grab hardly evidences competition on the merits or procompetitive competition. Indeed, Deere's blunderbuss proprietary assertions represent the height of exclusionary and anticompetitive conduct. See, e.g. *Morris Commc'ns Corp. v. PGA Tour*, 364 F.3d 1288, 1295 (11th Cir. 2004) ("[A]nticompetitive conduct ... is conduct without a legitimate business purpose that makes sense only because it eliminates competition."). Deere's anticompetitive intent is further shown through its use of a repair tie-in that prevents Deere equipment owners from accessing the agricultural data they themselves have generated using their own equipment. See, e.g. *Nobody in Particular Presents, Inc. v. Clear Channel Commc'ns* 311 F. Supp. 2d 1048, 1108 (D.Colo. 2004) (holding that tying arrangement conditioning air play of artists' songs on their use of defendants' concert promotional services was evidence of an anticompetitive intent).

equipment access to the information their own machines generate?³⁷ Furthermore, farmers are being doubly harmed, since, as discussed above, they also are denied the right to repair and maintain their own equipment.

Finally, Deere's dangerous probability of success is apparent through its majority ownership of the North American market, including a 53 percent market share of heavy tractors and a 60 percent market share of combines.³⁸ Furthermore, it is critical to understand just how strong of a history and hold Deere's name has on farmers.³⁹ For example, author Kirchmeier remembers playing with green toy Deere tractors as a boy while his family, like so many other farming families, loyally purchased Deere machinery. In addition, the high barriers of entry for other companies to enter the agricultural equipment industry are extraordinary. Without access to a substantial amount of the raw, hard data stored in Deere's software, how can other agricultural companies compete without brokering with Deere to purchase some or all of the data?

Deere's growing success in potentially monopolizing the growing digital agricultural information market is also shown through its partner-ships with other companies like Bayer/Monsanto, DowDupont, and BASF. These players already have negotiated with Deere to gain access to the information and farm equipment Deere effectively controls through its proprietary software. 40 Indeed, it does not seem a far stretch to believe that Deere and its partners may also be conspiring to monopolize the digital agricultural information market. 41 Given Deere's 53 percent control of the North American tractor market and its 60 percent control of the combine market, Deere may be at the center of such a possible conspiracy.

V. CONCLUSION

Deere's assertion that it solely owns the digital information collected by the software it has implanted in its agricultural machinery, and the digital agricultural farming data Deere equipment generates, is doubly troubling under America's antitrust and consumer protection laws. First, by making it impossible for farmers to access the software in their own equipment, farmers are being denied their historic rights to repair and maintain their own equipment. As a result, farmers are forced to pay higher prices to Deere's licensed dealers, often while having to endure greater delays in getting their Deere equipment repaired and maintained.

Second, with majority ownership of the North American large tractor and combine market, Deere is uniquely positioned to monopolize the exploding digital agricultural information market. Deere already has begun potentially leveraging its data collection monopoly by partnering with other large agricultural companies, including Bayer/Monsanto, DowDupont, and BASF.

It is time for the United States Congress, the Department of Justice's Antitrust Division, and the Federal Trade Commission, as well as state attorneys general and legislatures, to put an immediate end to Deere's anticompetitive and economically devastating practices to farmers. The idea that farmers own neither the equipment they purchase, nor the information they generate in their own fields, is outrageous. Both the economic welfare of America's farmers and the consumers they serve are at risk. The only question left is, who will truly stand up for America's farmers and consumers?⁴²

³⁷ See, e.g. Broadcomm Corp. v. Qualcomm Inc., 501 F.3d 297, 318 (3d Cir. 207) (holding that defendant acted with a specific intent monopolize a chipset market through anticompetitive practices lacking "a legitimate business justification").

³⁸ See, e.g. *American Tobacco Co. v. United States*, 328 U.S. 781, 797 (1946) (66 percent market share); *Arthur S. Langenderfer, Inc. v. S.E. Johnson Co.*, 917 F.2d 1413, 1443 (6th Cir. 1990) (58 percent share of pricing contracts); and *Kelco Disposal v. Browning-Ferris Indus.*, 845 F.2d 404, 409 (2d Cir. 1988) (55 percent market share, along with other market characteristics). As previously noted, this industry is a tight duopoly controlled by Deere and CNH Industrial, with combined North American market shares of approximately 88 percent for large tractors and 90 percent for combines. Such joint shares further magnify Deere's control of the market.

³⁹ See, e.g. Orrin Miller & John Froelich, The Story of a man and a Tractor, 45 The John Deere Legacy (Don McMillan ed., 2003); and The History of John Deere, https://www.deere.com/en/our-company/about-john-deere/.

⁴⁰ See Kelloway, supra note 17.

⁴¹ See, e.g. ABA Antitrous Devels., *supra* note 35, at 342-46; and Moss, *supra* note 11, at 7; (discussing "Big Ag's" growing control of crucial digital agricultural data); and Carbonell, *supra* note 27, at 2 ("By amassing huge quantities of previously proprietary data, companies are gaining a privileged position with unique insights into what farmers are doing around the clock, on a field-by-field, crop-by-crop basis.") By controlling and amalgamating such digital information, Big Ag companies are building massive competitive advantages in creating integrated, proprietary ag product systems.

⁴² With Midwestern Farmers filing for Chapter 12 bankruptcy protection at levels not seen for at least a decade, and suicides among farmers exploding, can we realistically hope for our antitrust laws to protect our farmers' consumer welfare? See, e.g. *Suicide Among Rural South Dakotans is a Serious Issue*, South Dakotan Farmers' Union News (Jan. 2, 2019), available at www.sdfn.org.



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