

# Beyond Data Privacy: In Search of Algorithmic Autonomy in Digital Agriculture

**Terry Wayne Griffin** ([twgriffin@ksu.edu](mailto:twgriffin@ksu.edu)) - Professor and Extension Economist at Kansas State University in the Department of Agricultural Economics, specializing in farm management and digital agriculture.

**Stephen A. Lind** ([stephen.lind03@gmail.com](mailto:stephen.lind03@gmail.com)) - 2025 graduate of Kansas State University with a B.S. in Political Science, focusing on public policy analysis and its implications for agricultural and resource management.

**Paul Goeringer** ([aglawclass@umd.edu](mailto:aglawclass@umd.edu)) - Principal Faculty and Extension Specialist at the University of Maryland in the Department of Agricultural and Resource Economics, specializing in legal risk management in agriculture.

July 2026

---

Imagine gathering farm data over the last twenty-plus years. Then the sensors that generate data from planters, yield monitors, and machinery logs help train the next generation of artificial intelligence (AI) in agriculture. Within a few months, insights based on this data are turned into a subscription service and then sold back to the farmer.

Much of today's agricultural data governance still reflects, at best, the debates of 2015 rather than the realities of 2026. Privacy, ownership, and portability remain important, but these assume that the primary asset is the intangible good itself, the data. Increasingly, the economically interesting product is the AI model trained on those datasets.

The essential question has evolved from who owns data to who enjoys the economic value generated when thousands of farm datasets are transformed into predictive AI models. A decade ago, discussions around farm data centered on privacy and the illusion of ownership. Concerns about equipment manufacturers or input suppliers obtaining access to field-level information to gain a competitive advantage were debated. Today, AI has expanded the ways economic value can be created from agricultural data.

Traditional software created value by organizing information. Modern AI creates value by learning patterns across very large amounts of information. As data from more farms is shared, the models become increasingly valuable, e.g., the classic Big Data example of increasing returns from data collection. AI has shifted the value of agricultural data away from individuals to predictive models built from billions of observations. A yield map once had value for a single field on a single farm. Today, thousands of yield maps can make recommendations for every farm. The competitive advantage now resides in the models created from the data.

Unilateral contracts primarily govern farm data in the absence of laws. Asymmetric agreements typically allow technology providers to collect, analyze, and commercialize this information for purposes beyond the original service. Current discussions of agricultural data governance continue to



emphasize ownership, informed consent, and privacy because these concepts are well established within existing legal and contractual frameworks. Ownership says little about who captures the value once farm data is ingested, possibly misappropriated, into AI systems.

### **Farm Data Training AI**

Consider thousands of combines harvesting corn across North America. Individually, each yield map helps a farmer assess field performance. Collectively, georeferenced maps become training data capable of improving disease detection, hybrid recommendations, fertilizer prescriptions, or autonomous machinery algorithms across millions of acres.

Modern agricultural platforms collect operational records from thousands of farms to improve software, develop predictive analytics, and increasingly train machine-learning models. Every planting pass, yield monitor observation, fertilizer application, and machinery log contributes to an ever-growing digital infrastructure that supports sophisticated proprietary black-box algorithms.

Once farm data has been used to train an AI model, it becomes difficult to understand how that information affected future predictions or to remove it after the fact. While farmers may still have access to the original files, limited visibility exists into how that data continues to create value beyond the farm gates.

Ownership is a static legal concept; control is about the ongoing ability to determine how information is collected, shared, analyzed, and commercialized. Ownership addresses who owns the data. Governance determines who decides how that data—and potentially more importantly, the intelligence derived from it—is used over time. Ownership debates are increasingly meaningless when the real value has shifted to the predictive models and intelligence built from that data. Whether existing governance frameworks will adequately address these issues remains an open policy question.

This lack of control over AI models is not an isolated problem; it is symptomatic of a broader issue with digital gatekeeping, most clearly seen in the Right-to-Repair movement.

### **Why Repair Is Also a Data Issue**

The Right-to-Repair movement is an example of how digital control goes beyond physical equipment. Modern machinery relies on proprietary software for diagnostics, calibration, and maintenance. When manufacturers restrict access to that software, they also control the flow of that data, e.g., influencing who can access, retrieve, or use operational data generated by the machine. For this reason, data portability problems become part of the repair conversation. Digital autonomy means more than replacing a hydraulic pump or sensor; it means having effective control over the information that the equipment continuously generates.



## Building AI Governance

As agricultural AI continues to grow, governance debates move beyond simple ownership language to cover responsibility throughout the data life cycle. But this accountability creates a practical problem with respect to innovation. The effectiveness and feasibility of governance can be measured by:

- whether farmers have clear information about when and how data from their operations are used to develop machine-learning models
- whether farmers have meaningful opportunities to opt out of commercial AI training without losing access to essential digital services
- the level of transparency provided for automated recommendations
- whether data portability reduces dependence on proprietary platforms.

Adequately addressing these issues may assist in innovation and ensure that AI develops through informed participation rather than passive data extraction. These objectives may create tradeoffs with incentives for innovation, an issue that continues to be debated in both policy and industry

## Why This Matters: Beyond Privacy

This discussion goes beyond the traditional focus on individual privacy and the asymmetric competitive advantages held by commercial agents. As AI becomes embedded in agricultural decision-making, governance intended to protect data and the long-term competitiveness of farmers will likely be circumvented to encourage innovation.

As autonomous machinery becomes more common, AI models will increasingly make functional decisions rather than just simple recommendations. The governance questions, therefore, extend beyond information management to questions of responsibility, liability, and human oversight, and how to prevent those governing rules from being circumvented.

Yesterday's challenge was protecting digital records.  
Tomorrow's challenge is governing the intelligence built from them.



**FURTHER READING:**

Atik, Can. 2022. "Towards Comprehensive European Agricultural Data Governance: Moving Beyond the 'Data Ownership' Debate." *IIC - International Review of Intellectual Property and Competition Law* 53 (May): 701–42. <https://doi.org/10.1007/s40319-022-01191-w>.

Bailey, Joshua, Fabio Castiblanco Rubio, Andrew D Balmos, et al. 2025. "Leveraging Generative AI for Data Analysis in Farm Management." *Applied Engineering in Agriculture* 41 (5): 505–19. <https://doi.org/10.13031/aea.16429>.

Berisha, Fjolla, Peter Mooney, Zohreh Pourzolfaghar, and Markus Helfert. 2026. "Shared yet Owned: The Dual Path of Data Ownership in Agriculture: A Systematic Review." *Data & Policy* 8: e3. <https://www.cambridge.org/core/journals/data-and-policy/article/shared-yet-owned-the-dual-path-of-data-ownership-in-agriculture-a-systematic-review/F70D1CCA14E0A31B74B4CD0EF5CF74AA>.

Carolan, Michael. 2018. "'Smart' Farming Techniques as Political Ontology: Access, Sovereignty and the Performance of Neoliberal and Not-so-Neoliberal Worlds." *Sociologia Ruralis* 58 (4): 745–64. <https://doi.org/10.1111/soru.12202>.

Coble, Keith H., Ashok K. Mishra, Shannon Ferrell, and Terry Griffin. 2018. "Big Data in Agriculture: A Challenge for the Future." *Applied Economic Perspectives and Policy* 40 (1): 79–96. <https://doi.org/10.1093/aep/px056>.

Ellixson, Ashley, Terry W. Griffin, Shannon Ferrell, and Paul Goeringer. 2019. "Legal and Economic Implications of Farm Data: Ownership and Possible Protections." *Drake Journal of Agricultural Law* 24 (1): 4975. <https://aglawjournal.wp.drake.edu/wp-content/uploads/sites/66/2025/04/Ellixson-Griffin-Ferrell-Goeringer-Macro-Final.pdf>.

Griffin, Terry W., Tyler B. Mark, Shannon Ferrell, et al. 2016. "Big Data Considerations for Rural Property Professionals." *Journal of the ASFMRA*, 167180. <http://www.istor.org/stable/90016047>.

Johnson, Anna. 2025. "Data Security in Precision Agriculture: How Machine Learning Will Exacerbate the Privacy Risks of Farming." *Boston College Intellectual Property and Technology Forum*, October. <https://lira.bc.edu/works/publication-article/zg5iy-frn43>.

Jouanjean, Marie-Agnes, Francesca Casalini, Leanne Wiseman, and Emily Gray. 2020. "Issues Around Data Governance in the Digital Transformation of Agriculture: The Farmers' Perspective." *OECD Food, Agriculture and Fisheries Papers*. [https://www.oecd-ilibrary.org/en/publications/issues-around-data-governance-in-the-digital-transformation-of-agriculture\\_53ecf2ab-en.html](https://www.oecd-ilibrary.org/en/publications/issues-around-data-governance-in-the-digital-transformation-of-agriculture_53ecf2ab-en.html).

Milian Gomez, Jorge Freddy, José Grabiél Luis Cordova, Koen Byttebier, et al. 2024. "Unpacking the Food Law, Policy and Diplomacy Conference Dialogue: A Synoptic Retrospective." *International Journal of Regional, Rural and Remote Law and Policy (IJRRRLP)* 11 (1): 113. <https://search.informit.org/doi/10.3316/informit.T2024100700009291056664362>.



- Pohl, S. 2025. "Mitigating Legal Risks from Using Artificial Intelligence (AI) in Precision Agriculture." *Drake Journal of Agricultural Law*. <https://aglawjournal.wp.drake.edu/wp-content/uploads/sites/66/2025/11/c.-Pohl-Final.pdf>.
- Rotz, Sarah, Emily Duncan, Matthew Small, et al. 2019. "The Politics of Digital Agricultural Technologies: A Preliminary Review." *Sociologia Ruralis* 59 (2): 203–29. <https://doi.org/10.1111/soru.12233>.
- Rouzky, Radwan, Abdolhossein Sarrafzadeh, Evelyn Sowell-Boone, Hannaneh B Pasandi, and Gregory Goins. 2026. "Data Governance in Smart Farming: A Systematic Review of Challenges and Gaps." *Information Processing in Agriculture* 13 (2): 303–17. <https://doi.org/10.1016/j.inpa.2025.11.006>.
- Tahir, Hassam Ahmed, Walaa Alayed, and Waqar Ul Hassan. 2025. "A Federated Explainable AI Framework for Smart Agriculture: Enhancing Transparency, Efficiency, and Sustainability." *IEEE Access* 13: 97567–84. <https://doi.org/10.1109/ACCESS.2025.3571340>.
- Tusikov, Natasha. 2025. *The Right to Repair in Canada: Advantages and Pitfalls*. no. 9. <https://doi.org/10.51644/BCS009>.
- Wilson, C. 2023. "Too Big to Fail: How Consolidation in the Agricultural Industry Has Created Unintended Consequences That Threaten Farmers, Consumers, and Our National Security." *Drake Journal of Agricultural Law*. <https://aglawjournal.wp.drake.edu/wp-content/uploads/sites/66/2024/01/Wilson-Ready-for-PUBLISH.pdf>.
- Wiseman, Leanne, Kanchana Kariyawasasm, and Lucas Davey. 2020. "The Mandatory Repair Scheme for Motor Vehicles 2019: Australia's First Response to the International Right to Repair Movement?" *Australian Business Law Review*. <https://research-repository.griffith.edu.au/items/50e1534b-a388-4195-88d6-37ea8ef411d9>.
- Wiseman, Leanne, and Jay Sanderson. 2019. "Farms Create Lots of Data, but Farmers Don't Control Where It Ends up and Who Can Use It." *The Conversation* 16. [https://research.usc.edu.au/view/pdfCoverPage?instCode=61USC\\_INST&filePid=13129824820002621&download=true](https://research.usc.edu.au/view/pdfCoverPage?instCode=61USC_INST&filePid=13129824820002621&download=true).
- Wiseman, Leanne, Jay Sanderson, Airong Zhang, and Emma Jakku. 2019. "Farmers and Their Data: An Examination of Farmers' Reluctance to Share Their Data Through the Lens of the Laws Impacting Smart Farming." *NJAS-Wageningen Journal of Life Sciences* 90: 100301. <https://www.sciencedirect.com/science/article/pii/S1573521418302616>.
- Yu, Ziwen, Ethan Hou, Jean Pompeo, Ray Huffaker, Mo Wang, and Yabing Zhao. 2025. "Agriculture Technology Providers' Perspectives of Data Rights and Obligations in Agriculture Reflected by Farm Data Value Chain." *Sustainable Futures* 9: 100585. <https://doi.org/10.1016/j.sftr.2025.100585>.

Zhang, Airong, Richard Heath, Katie McRobert, et al. 2021. "Who Will Benefit from Big Data? Farmers' Perspective on Willingness to Share Farm Data." *Journal of Rural Studies* 88: 346353.  
<https://www.sciencedirect.com/science/article/pii/S0743016721002308>.

Zwagerman, Jennifer. 2021. "Agriculture & Data Privacy: I Want a Hipaa (Potamus) for Christmas... Maybe." *Maybe (Spring 2021)*. *Texas A&M Law Review* 8 (4): 685–734.

<https://scholarship.law.tamu.edu/cgi/viewcontent.cgi?article=1227&context=lawreview>

---

For more information about this publication and others, visit [AgManager.info](http://AgManager.info).

K-State Agricultural Economics | 342 Waters Hall, Manhattan, KS 66506-4011 | 785.532.1504

[www.ageconomics.k-state.edu](http://www.ageconomics.k-state.edu)

[Copyright 2026: AgManager.info](http://AgManager.info) and K-State Department of Agricultural Economics

