

Digital Policy Hub – Working Paper

Farm Data Ownership and Intellectual Property Laws

Mahatab Uddin

Winter 2024 cohort

About the Hub

The Digital Policy Hub at CIGI is a collaborative space for emerging scholars and innovative thinkers from the social, natural and applied sciences. It provides opportunities for undergraduate and graduate students and post-doctoral and visiting fellows to share and develop research on the rapid evolution and governance of transformative technologies. The Hub is founded on transdisciplinary approaches that seek to increase understanding of the socio-economic and technological impacts of digitalization and improve the quality and relevance of related research. Core research areas include data, economy and society; artificial intelligence; outer space; digitalization, security and democracy; and the environment and natural resources.

The Digital Policy Hub working papers are the product of research related to the Hub's identified themes prepared by participants during their fellowship.

Partners

Thank you to Mitacs for its partnership and support of Digital Policy Hub fellows through the Accelerate program. We would also like to acknowledge the many universities, governments and private sector partners for their involvement allowing CIGI to offer this holistic research environment.



About CIGI

The Centre for International Governance Innovation (CIGI) is an independent, non-partisan think tank whose peer-reviewed research and trusted analysis influence policy makers to innovate. Our global network of multidisciplinary researchers and strategic partnerships provide policy solutions for the digital era with one goal: to improve people's lives everywhere. Headquartered in Waterloo, Canada, CIGI has received support from the Government of Canada, the Government of Ontario and founder Jim Balsillie.

Copyright © 2024 by Mahatab Uddin

The opinions expressed in this publication are those of the author and do not necessarily reflect the views of the Centre for International Governance Innovation or its Board of Directors.

Centre for International Governance Innovation and CIGI are registered trademarks.

67 Erb Street West
Waterloo, ON, Canada N2L 6C2
www.cigionline.org

Key Points

- Expanding climate-smart agriculture relies on deploying artificial intelligence- (AI-) driven digital technologies, such as big data, machine learning and deep learning.
- Farmers are concerned about sharing their data because they fear it may be mishandled by untrustworthy parties and used against them, particularly as they typically encounter two primary legal challenges in AI-enabled climate-smart agriculture: data ownership and privacy.
- The patent system does not adequately govern ownership of farm data as it mainly protects inventions: raw data, such as farm data, does not meet the criteria for patent classification.
- Farm data is unlikely to be eligible for copyright protection. In Europe, data producers may own farm data if they can prove substantial investment in obtaining, verifying or presenting the database contents through the “database right.”
- Trade secrets are the most effective intellectual property rights to establish ownership of farm data.

Introduction

Expanding climate-smart agriculture requires large-scale deployment of digital technologies, including AI-run systems that utilize big data, machine learning and deep learning (Uddin, Chowdhury and Kabir 2022; Sadiku, Ashaolu and Musa 2020). In digital technology-based agricultural practice, farmers and/or agricultural farms need to provide various kinds of farming-related data to their agricultural technology providers. These providers may, in turn, be required to share the farmers’ or farms’ data with other relevant stakeholders. Data collected from farms can be broadly classified into two categories: personal data and farm data. Personal data includes information related to farmers, such as their names, email addresses and locations. Farm data encompasses information such as crop details, livestock records and machinery specifications. With the significant volumes of data being gathered from farms, there is a mounting concern regarding farmers’ privacy and the implementation of effective farm data protection measures (Kaur et al. 2022, 2).

In connection with data sharing, farmers are concerned that unreliable parties could manage their data, potentially leading to it being used against them (Ferris 2017, 84). Additionally, there is apprehension among some farmers that their shared data could be leaked to regulatory bodies and governmental agencies (Sykuta 2016). Such authorities might use this data to impose various penalties, fees, fines and restrictions on farmers (ibid., 230; Mark 2019, 9; Uddin, Chowdhury and Kabir 2022, 230).

An important concern regarding the use of AI in climate-smart agriculture is the ownership and control of data. Farmers need to decide how much of their data usage rights they should give up to their technology providers. It is also essential to determine whether these providers have the authority to share farmers’ data with any third party, be it public or private (Uddin, Chowdhury and Kabir 2022, 230).

In view of the above, farmers face two key legal challenges in AI-powered climate-smart agricultural practices: data ownership and data privacy. This working paper aims to address the issue of farm data ownership through legal analysis. Given the intangible nature of data, this ownership issue will be examined within the context of current intellectual property (IP) law systems, which offer ownership for intangible creations for a given length of time.

Among various intellectual property laws, trademarks and brand names, geographical indications authenticate the geographical origin of products, rendering them irrelevant to the issue of farm data ownership. Similarly, industrial and layout designs (topographies) of integrated circuits pertain to visible designs and are thus not applicable to the ownership of farm data. Hence, this working paper will exclusively focus on the suitability of patent, copyright and trade secrets as potential modes of ownership for farm data.

Owning Farm Data under IP Law

Patent for Farm Data

Article 27(1) of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS)¹ denotes that “patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are *new*, involve an *inventive step* and are capable of *industrial application*” (emphasis added). TRIPS also clarified that the term “inventive step” means “non-obvious,” and “industrial application” means “useful.” In practice, the US Patent Act adopted the term “non-obviousness” while the EU Patent Convention has used “inventive step.” In Canada, this is referred to as “inventive ingenuity.”²

In Canada, an invention needs to fulfill the following three conditions in order to receive a patent: it must be “new (first in the world)”; “useful (functional and operative)”; and “show inventive ingenuity and not be obvious to someone skilled in that area.”³ In Europe, patents are granted for those inventions that are “new, involve an inventive step and are susceptible of industrial application.”⁴ In the United States, an invention must fulfill three conditions to receive a patent: It should be “able to be used (the invention must work and cannot just be a theory),” and include “a clear description of how to make

1 WTO, *Agreement on Trade-Related Aspects of Intellectual Property Rights (unamended) (TRIPS), Annex 1C of the Marrakesh Agreement Establishing the World Trade Organization*, 15 April 1994, 1867 UNTS 154, 33 ILM 1114 (1994) (entered into force 1 January 1995) [TRIPS Agreement], online: WTO <www.wto.org/english/docs_e/legal_e/27-trips_01_e.htm>.

2 See Canadian Intellectual Property Office (2000, 4).

3 Ibid.

4 *Convention on the Grant of European Patents (European Patent Convention) of 5 October 1973 as revised by the Act revising Article 63 EPC of 17 December 1991 and the Act revising the EPC of 29 November 2000*, 5 October 1973, art 56 (entered into force 7 October 1977), online: EPO <www.epo.org/en/legal/epc/2020/convention.html>.

and use the invention.” The invention must also be “new” or “novel (something not done before)” and “not obvious,” as in not merely a “change to something already invented.”⁵

While novelty, inventiveness/non-obviousness and usefulness/industrial application are common requirements of patentability, farm data may not meet these three requirements. More specifically, while farm data may be new and have the potential for industrial application, it may not pass the “inventive step” test under existing patent-related national laws and standards.

The criteria outlined by the European Patent Convention, as well as in US and Canadian patent law, make it clear that any purported innovation must represent an enhanced or evolved iteration of an existing technology, a concept that would not have been readily apparent or easily understood by professionals operating within the pertinent technological domain (Uddin and Huq 2020, 28). When considering farm data, identifying prior art or existing technologies for comparison presents a challenge. Moreover, it will also be challenging to ascertain how data produced by a farmer or farm is considered enhanced or advanced compared to already existing data. As such, the patent system is ill-suited for governing farm data ownership as it primarily safeguards “inventions.” Raw data, such as farm data, fails to meet the criteria for classification as an invention.⁶

However, even though farm data itself is not eligible for patenting, patentable inventions could still emerge from analyzing it. While this does not imply that the data itself can be patented, it does highlight the importance of the agreement governing the farmer’s disclosure of farm data to clarify the ownership of inventions derived from it.⁷

Hence, even if copyright or other laws do not prevent third parties from accessing or utilizing the underlying data, the capacity to make certain uses of the data might be restricted if the data is linked to any invention protected by patent rights (De Beer, Oguamanam and Ubalijoro 2023, 35).

Copyright for Farm Data

While ownership of data sets (excluding raw data) is primarily established through copyright law in common-law countries such as Australia, Canada, New Zealand, the United Kingdom and the United States, database creators in the European Union have been granted a distinct property right, known as a “database right,” since 1996 (Wiseman et al. 2019, 8).⁸ At the global level, as per the TRIPS agreement, copyright protection is available for “expressions,” not “ideas, procedures, methods of operation, or mathematical concepts as such.”⁹

5 See www.uspto.gov/patents/basics/essentials.

6 See Lashmet (2015).

7 Ibid.

8 See also EC, *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases*, [1996] OJ, L 77/20, art 3(1), online: *EUR-Lex* <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31996L0009>>; Wiseman et al. (2019).

9 *TRIPS Agreement*, *supra* note 1.

This protection of “expressions” has also been expressed in national legislation. Moreover, the relevant works need to fulfill the criteria of “originality” too.¹⁰

For instance, in Canada, conditions for subsistence of copyright require that the work needs to be original.¹¹ Similarly in the United States, the federal Copyright Act states that “copyright protection subsists, in accordance with this title, *in original works of authorship* fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device” (emphasis added).¹²

Hence, while the copyright model has potential applicability to farm data, it also presents several obstacles that would need to be addressed. Primarily, the inclusion of “works of authorship” in the statute implies the requirement for a creative element, which may not align well with farm data.¹³ Furthermore, the term “original works of authorship” has been construed to necessitate a degree of creative contribution from the copyright holder.¹⁴ This criterion was underscored in the *Feist Publications, Inc v Rural Tel Serv Co* case, wherein the US Supreme Court ruled that the Copyright Act does not safeguard individual facts.¹⁵

In the *Feist Publications* case, the central issue revolved around the copyrightability of a basic telephone directory, comprised solely of a list of telephone numbers arranged alphabetically by the last name of the holder.¹⁶ As the directory contained purely factual data and was structured in the most practical manner for such information, the Supreme Court ruled that it failed to meet the creative standards outlined in the Copyright Act.¹⁷ This ruling reiterated the principle that unaltered facts and data alone are not eligible for copyright protection. Nonetheless, authors can incorporate creative elements such as illustrations, commentary or alternative organizational methods into facts and data, thereby making those creative components copyrightable, even if the underlying facts and data themselves are not.¹⁸

Although individual facts may not possess originality on their own, a collection of facts can potentially possess the required component of originality. The compiler of a collection usually determines which facts to include and how to organize them to make the data more understandable and useful for readers. As long as the choices made by the compiler in selecting and arranging the data are made independently and involve even a minimal level of creativity, they are sufficiently original to protect their collection under copyright law. Therefore, even a directory devoid of protectable written expression and containing only facts would meet the legal threshold for copyright protection in the United States if it represents an original selection or arrangement.¹⁹

10 WIPO, *Berne Convention for the Protection of Literary and Artistic Works of 9 September 1886*, online: WIPO <www.wipo.int/wipolex/en/text/283698>.

11 *Copyright Act*, RSC 1985, c C-42, s 5(1), online: *CanLII* <<https://canlii.ca/t/5610r>>.

12 17 USC, § 102(a)

13 *Ibid.*

14 *Ibid.*

15 *Feist Publications, Inc v Rural Tel Serv Co*, 499 US 340 (1991) at 350–51 [*Feist Publications*].

16 *Ibid.* at 342

17 *Ibid.* at 363–64.

18 *Ibid.* at 344–50.

19 *Ibid.* at 347–48

In the case of *Football Association Premier League Ltd and Others v QC Leisure and Others* in the United Kingdom, the Court of Justice clarified that the standard of “the author’s own intellectual creation” (commonly referred to as originality) implies that the selection or arrangement of data results from creative choices. Article 3(1) of the European Union database directive states that, “In accordance with this Directive, databases which, by reason of the selection or arrangement of their contents, constitute the author’s own intellectual creation shall be protected as such by copyright. No other criteria shall be applied to determine their eligibility for that protection.”²⁰ By applying this article, the court determined that mere investment of significant skill and labour does not warrant a finding of originality. In essence, the originality criterion set forth in the database directive overrides any copyright protection for databases solely based on investment or other criteria.²¹ This decision by the court not only put an end to the long-standing practice in the United Kingdom of granting copyright protection to data compilations based on skill and labour (investment), but also extended to other member states. For instance, the Dutch protection of non-original writings (*geschriftenbescherming*), which had been in place for over a century in the Netherlands as a means of safeguarding non-original writings and compilations, was officially abolished in 2014 following the *Football Association Premier League* case (Hugenholtz 2013).

The case also negated copyright protection for data compilations solely generated by machines without human intervention, in accordance with the principle that copyright requires human authorship. However, it is important to highlight that the UK Copyright, Design and Patents Act extends copyright protection to works created by machines: “In the case of a literary, dramatic, musical, or artistic work, which is computer-generated, the author shall be taken to be the person by whom the arrangements necessary for the creation of the work are undertaken.”²² Whether this provision can harmonize with the judgments of the *Football Association Premier League* case remains uncertain. According to the European Court, there is no originality “when the setting up of the database is dictated by technical considerations, rules or constraints which leave no room for creative freedom.”²³ Both TRIPS and the World Intellectual Property Organization’s Copyright Treaty caution that copyright in compilations of data does “not extend to the data or material itself.”²⁴ Similarly, the European Union’s database directive warns that database copyright “shall not extend to their contents,”²⁵ thus ruling out copyright protection for the data compiled in a database.

Hence, it seems that agricultural farm data is less likely to be protected under the current copyright system. However, like patents, farm data has the potential to generate copyrightable works, even if the underlying data itself is not protected. For instance, while the raw farm data might not be eligible for copyright, a report that summarizes

20 EC, *Directive 96/9/EC of the European Parliament and of the Council of 11 March 1996 on the legal protection of databases*, [1996] OJ, L 77/20, art 3(1), online: *EUR-Lex* <<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31996L0009>>.

21 *Football Association Premier League Ltd and Others v QC Leisure and Others (C-403/08)* and *Karen Murphy v Media Protection Services Ltd (C-429/08)*, [2011] ECR I-09083 [*Football Association Premier League*].

22 *Copyright, Designs and Patents Act 1988 (UK)*, c 48, s 9(3); see Perry and Margoni (2010).

23 *Football Association Premier League*, *supra* note 21.

24 See WIPO, *Copyright Treaty*, 20 December 1996, TRT/WCT/001 art 5 (entered into force 6 March 2002), online: *WIPO* <www.wipo.int/wipolex/en/text/295166>; *TRIPS Agreement*, *supra* note 1.

25 *Directive 96/9/EC*, *supra* note 20.

the data and provides recommendations could be.²⁶ Additionally, there is ongoing debate regarding the scope of copyright protection and ownership concerning works produced by copyrighted materials, such as software embedded in agricultural equipment.²⁷ Therefore, it is essential for those disclosing farm data to incorporate language into their agreements with the receiving party, clearly defining the rights to works derived from the data.

It is important to note that the European Union has recently considered proposals to confer rights upon data producers, which could be enforced against non-contractual third parties engaging in unauthorized data usage. This suggested entitlement might manifest as a property right regarding data or a defensive right reminiscent of protecting *de facto* possession, rather than outright ownership (Stepanov 2020).

The proposed right stems from two primary motivations. First, there is a concern that the existing legislative framework does not offer sufficient protection or clarity, thereby impeding the ongoing growth of the data economy. Second, there is apprehension that ineffective implementation of the European data strategy could obstruct access to data, which is fundamental to the entire data economy. Within this context, the concept of a data producer's right, akin to a property right, has been put forward as a policy solution to tackle these concerns. This strategy aims to foster expansion in the data economy and aid in trade facilitation (European Commission 2017a, 2017b; Van Asbroeck, Debussche and César 2017; Ritter and Mayer 2018, 86).

While a report published by Bird & Bird (2017) applauds the European Union's proposal for the creation of data producers' rights by suggesting "the creation of a non-exclusive, flexible and extensible ownership right in data(sets), with a data traceability obligation as a safeguard" (Van Asbroeck, Debussche and César 2017, 5), the leading experts worldwide have contested the idea of introducing a new data producers' right as a favourable policy (Hugenholtz 2018, chapter 3; Yu 2019). For example, P. Bernt Hugenholtz from the University of Amsterdam argues that "introducing such an all-encompassing property right in data would seriously compromise the system of intellectual property law that currently exists in Europe. It would also contravene fundamental freedoms enshrined in the European Convention on Human Rights and the EU Charter, distort freedom of competition and freedom of services in the EU, restrict scientific freedoms and generally undercut the promise of big data for European economy and society. In sum, it would be a very bad idea" (Hugenholtz 2018, chapter 3). Since the European Union's recent proposal favoured the "creation of an ownership-type of right" over an IP right for data (Van Asbroeck, Debussche and César 2017, 122), the growing momentum surrounding this issue in Europe may have the potential to impact normative debates in various international fora, whether directly or indirectly. Hence, vigilant monitoring of this issue could assist farmers or farm data producers in adopting a sustainable long-term strategy (De Beer, Oguamanam and Ubalijoro 2023, 34).

²⁶ Feist Publications, *supra* note 15.

²⁷ Compare Bartholomew (2014) with Wiens (2015).

Trade Secrets for Farm Data

Article 39 of the TRIPS Agreement allows member states to offer protection for undisclosed information or trade secrets:

natural and legal persons shall have the possibility of preventing information lawfully within their control from being disclosed to, acquired by, or used by others without their consent in a manner contrary to honest commercial practices so long as such information:

(a) is *secret* in the sense that it is not, as a body or in the precise configuration and assembly of its components, generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question;

(b) has *commercial value* because it is secret; and

(c) has been subject to *reasonable steps* under the circumstances, by the person lawfully in control of the information, to keep it secret.²⁸

This article outlines that trade secrets consist of three fundamental components. First, the information in question must be kept confidential. Second, that information holds commercial value because of its secrecy. Third, reasonable measures must be implemented to maintain the secrecy of the information. The next section of this paper will evaluate whether agricultural farm data aligns with these three essential components of trade secrets, considering the US Uniform Trade Secrets Act (UTSA).²⁹

Is Farm Data Secret?

Information that constitutes common knowledge within an industry or represents minor advancements in established formulas or processes is not considered as secret, and information that can be readily acquired from various publicly accessible sources cannot be classified as trade secrets. Conversely, information that is exclusively held by its creator or discoverer, and is unavailable elsewhere, aligns closely with the fundamental nature of a trade secret. As accessing the information becomes more challenging, that information increasingly qualifies as a trade secret (Ferrell 2016, 34).

In the case of farm data, in the absence of proactive efforts by the farmer or equipment/input vendors to publicize farm data, it is improbable that the data will become part of the public domain, especially beyond the farm level, as evident in reports filed with diverse government agencies (ibid.). It is more likely that trade secrets related to farm data exist in the telematics and agronomic data of agricultural operations, rather than in the reports submitted to agencies at the farm level. Even though third parties can access data about farm operations without the farmer's direct disclosure, as in the cases of aerial satellite imagery or advanced terrestrial sensors, farm data is still likely to remain confidential (ibid.).

28 *TRIPS Agreement*, *supra* note 1, art 39 [emphasis added].

29 "A model law drafted by the National Conference of Commissioners on Uniform State Laws that codifies the basic principles of common law trade secret protection. The UTSA (in modified or unmodified form) has been enacted by 49 states (the exception is New York), the District of Columbia, and the US Virgin Islands" (see [https://uk.practicallaw.thomsonreuters.com/8-503-0516?transitionType=Default&contextData=\(sc.Default\)&firstPage=true](https://uk.practicallaw.thomsonreuters.com/8-503-0516?transitionType=Default&contextData=(sc.Default)&firstPage=true)).

Does Farm Data Have Commercial Value because of Its Secrecy?

It is widely acknowledged that a farmer's specific methods for cultivating and nurturing corn are built partly on experience that includes data from previous years, such as soil conditions, fertilizer usage, irrigation practices and so on. This information is typically not accessible or easily discernible to individuals within or outside the agricultural sector. Such knowledge can enhance production and efficiency, thereby contributing economic value to the farmer, even though long-term profits may trend toward zero (ibid.).

However, demonstrating the value of data alone is not sufficient to meet the statutory requirements. One must also demonstrate that the data either holds independent economic value currently or has the potential to do so in the future, because it is not generally known or easily accessible to other individuals who could benefit economically from its disclosure or use. In essence, the question arises: Does farm data from a farmer's field become more valuable simply because it is unknown to other farmers?³⁰

If farmers develop innovative ways to cultivate corn that reduce resource usage or increase yields significantly, they could make more profits in the short term that would not be possible if other producers had knowledge of these methods. However, if other farmers obtained data that showed that another farmer was underperforming in a crop-share lease, they could bid competitively for leased land resources, which could divert them away from that underperforming farmer. Therefore, it can be argued that data originating from a farm has value due to its confidentiality (Ellixson et al. 2019, 57).

However, scholars have also presented a contrasting viewpoint, suggesting that farm-specific data is relevant only to the specific farm from which it originates. This perspective suggests that the data holds little economic value for other individual producers, notwithstanding discussions regarding the value of aggregated data (which will be addressed later in this paper), as it loses its significance when applied to farms with varying soil types, hydrologic conditions, micro-climates and other factors. While an individual farm's data might provide some general insights to another individual producer, its usefulness would decline rapidly, if not completely, if the recipient attempted to apply it to their own farm (ibid., 58).

To illustrate this with an example, consider an owner's manual of an electric car, which holds limited value to the owner of a diesel pick-up. While the basic techniques of steering and changing a flat tire remain consistent between different vehicles, attempting to use diesel fuel or an extension cord interchangeably would yield unfavourable outcomes. Similarly, attempting to implement farming prescriptions from one farm onto another may result in marginal enhancements, at best, or potentially harmful consequences, at worst (ibid.).

Arguably, this skepticism is applicable to big data used in AI-powered agriculture. This is because the data generated by farmers or farms is constantly updated, forming new data sets that could assist other farmers or stakeholders in the agricultural data supply chain in formulating their respective business strategies and gaining significant economic advantages.

³⁰ 18 USC § 1839 (2018).

Possible “Reasonable Steps” to Take to Keep Farm Data Secret

The specific reasonable precautions required for a court to acknowledge farm data as a trade secret are not entirely clear. However, it is established that courts generally look for evidence of proactive measures taken to protect confidentiality.³¹ Shannon Ferrell (2016) proposes several actions that could be seen as “reasonable measures” for protecting farm data as a trade secret while it stays “on the farm”: thoroughly vetting potential employees to gauge their attitudes toward confidentiality and proprietary information; educating employees on the significance of maintaining data confidentiality; ensuring that back-up copies of data are created without granting access to other entities; limiting employee access to sensitive information; implementing password protections for electronic servers and files; controlling visitor and employee access to physical locations where sensitive data may be accessible (if feasible); providing ongoing training to employees regarding the methods employed to protect farm data; and mandating a majority vote by farm operators before sharing data with a third party.

An important concern arises when employees depart from the farm operation or cease employment there. It is imperative for the farmer to revoke any access the employee previously had to farm data, which may entail altering passwords, access points and other security measures. Upon the employee’s departure, the farmer should contemplate conducting an exit interview that includes a review of the signed non-disclosure agreement. During this interview, it is crucial to ensure that the departing employee comprehends their obligations regarding data confidentiality and that they will uphold such policies in the future (Ellixson et al. 2019, 59).

The implementation of these security measures will entail a significant investment of both time and resources. Farmers would need to assign considerable value to the confidentiality of their information to justify the expense associated with such measures. Moreover, while there are actions farmers can undertake to safeguard data while it remains on the farm, in an age dominated by automated telematics and wireless communication, the inquiry prompted by the third criterion for trade secret protection comprises two key aspects. First, do farmers actively pursue measures to shield data from disclosure? And second, are farmers capable of implementing these measures (ibid.)?

To answer this first question, historically speaking, farmers have not treated their data as “secret.” While they have not necessarily publicized their data, farmers, landowners and their advisers have generally not made concerted efforts to preserve the confidentiality of farm data or their agricultural methods. However, with the significant rise since the early 2010s in discussions surrounding farm data and its potential economic importance, many farmers have begun to inquire about methods to maintain data privacy. As their understanding of data collection and transmission technologies grows, some farmers may become more proactive in seeking to safeguard their data (ibid.).

The second question may hold the utmost relevance: Are farmers capable of implementing measures to keep data confidential? The response to this question may depend on the nature of agricultural production, which often takes place in open

31 *Uniform Trade Secrets Act with 1985 Amendments* § 1(4) (1979), online: *Uniform Law Commission* <www.uniformlaws.org/committees/community-home?CommunityKey=3a2538fb-e030-4e2d-a9e2-90373dc05792>.

outdoor settings. For example, on one hand, a farmer growing corn outdoors would not expect privacy since this activity is easily visible to the public. This makes it difficult to argue for the implementation of measures to keep certain aspects of the operation confidential, given how easily ascertainable the information is. But on the other hand, some parts of the operation might not be easily observable or determinable without direct access to farm data, which is not publicly visible but instead gathered and stored within the farm's telematics systems (ibid.).

However, data is not solely confined to telematics systems: it is frequently transmitted to equipment manufacturers via automated processes that require no operator intervention, typically operating under an "opt-out" rather than "opt-in" framework (ibid.). Since around 2011, many newly manufactured tractors come equipped with cellular modems that automatically relay a wide array of machine parameters back to the manufacturer (Dyer 2016, 19; Upbin 2013). While such arrangements offer various benefits to equipment owners, such as enhancing preventive maintenance and reducing equipment downtime, one could argue that farmers then lack a claim to trade secrets in the form of farm data because it is largely automatically shared with manufacturers (Ellixson et al. 2019, 60). This assertion stems from the fact that a considerable portion of the data constituting this secret has already been shared with other parties through the equipment's telematics systems (ibid.).

However, the revelation of data to a third party does not necessarily spell the end for a claim to trade secrets. Trade secrets are frequently shared with other parties while still maintaining their status as trade secrets, provided that an agreement to uphold the data's confidentiality is upheld.³² The worth of trade secrets would be significantly diminished if they could not be shared with consultants and other advisers who assist the owner of the trade secret in maximizing its utility (ibid.).

Therefore, trade secret law acknowledges that trade secrets can be divulged to others as long as adequate measures are implemented to ensure that the recipient also maintains its secrecy: "Information known by individuals other than the trade secret owner can retain its classification as a trade secret if it remains undisclosed to others who might find it economically valuable. [T]he precautions demanded of the trade secret owner may increase as the dissemination of the information expands" (ibid.).

While the protection afforded to corn yield maps may not need to match that of nuclear launch codes, courts have consistently ruled that security measures should be proportional to the value of the confidential information. The underlying principle revolves around a straightforward cost-benefit analysis: trade secret owners must evaluate the value of their secret, the potential risks of its disclosure and the costs of implementing security measures within the owner's discretion (ibid.).

³² See Fenwick & West LLP (2001).

Recommendations

- Although farm data itself is not patentable, its analysis could lead to patentable inventions. In addition, potential copyrightable works may emerge from this data; even if the raw data is not protected, derivative works such as reports that distill data and offer recommendations could be eligible for copyright protection. This underscores the significance of agreements governing the farmer's disclosure of farm data to determine ownership of inventions stemming from it. As such, it is advisable that farm data disclosure agreements incorporate provisions for potential ownership sharing or benefit sharing concerning any patentable inventions derived from shared data.
- To claim ownership of farm data under the database right in Europe, relevant data producers are advised to demonstrate significant investment in acquiring, verifying and/or presenting the contents of the database.
- In existing IP rights systems, if farmers or farms are to retain ownership of farm data/farmer's data, it is recommended that they use the trade secret method.

Acknowledgements

The author would like to thank Ataharul Chowdhury, Matthew da Mota and Jeremy de Beer.

About the Author

Mahatab Uddin is an adjunct professor and post-doctoral researcher at the School of Environmental Design and Rural Development at the University of Guelph and an expert on climate change law, intellectual property law, technology law and sustainable development. His post-doctoral research at the University of Guelph has been supervised by Ataharul Chowdhury in collaboration with the Digital Policy Hub and focuses on legal and ethical frameworks for AI-run, climate-smart agricultural practices.

Works Cited

- Bartholomew, Darin. 2014. "Long Comment Regarding a Proposed Exemption Under 17 U.S.C. 1201." https://copyright.gov/1201/2015/comments-032715/class%2021/JohnDeereClass21_1201_2014.pdf.
- Canadian Intellectual Property Office. 2000. *A Guide to Patents*. January. Hull, QC: Industry Canada.
- de Beer, Jeremy, Chidi Oguamanam and Éliane Ubalijoro. 2023. *Ownership, Control, and Governance of the Benefits of Data for Food and Agriculture: A Conceptual Analysis and Strategic Framework for Governance*. Global Open Data for Agriculture & Nutrition, Future Earth Canada Hub and Sustainability in the Digital Age. <https://doi.org/10.5281/zenodo.7054790>.
- Dyer, Jonathan. 2016. *The Data Farm. An investigation of the implications of collecting data on farm*. A report for Nuffield Australia Farming Scholars. North Sydney, Australia: Nuffield Australia. www.nuffield scholar.org/sites/default/files/reports/2015_AU_Jonathan-Dyer_The-Data-Farm-An-Investigation-Of-The-Implications-Of-Collecting-Data-On-Farm.pdf.
- 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*. <https://doi.org/10.2139/ssrn.3286332>.
- European Commission. 2017a. "Commission Staff Working Document on the free flow of data and emerging issues of the European data economy." <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52017SC0002>.
- — —. 2017b. "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: 'Building a European Data Economy.'" <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2017:9:FIN>.
- Fenwick & West LLP. 2001. "Trade Secrets Protection: A Primer and Desk Reference for Managers and In House Counsel." San Francisco, CA: Fenwick & West LLP. <https://perma.cc/N7CV-LXW2>.
- Ferrell, Shannon L. 2016. "Legal Issues on the Farm Data Frontier, Part I: Managing First-Degree Relationships in Farm Data Transfers." *Drake Journal of Agricultural Law* 21 (1): 13–57. <https://aglawjournal.wp.drake.edu/wp-content/uploads/sites/66/2018/10/FerrellFinalMacro.pdf>.
- Ferris, Jody L. 2017. "Data Privacy and Protection in the Agriculture Industry: Is Federal Regulation Necessary?" *Minnesota Journal of Law Science & Technology* 18 (1): 309–42.
- Hugenholtz, P. Bernt. 2013. "Goodbye, Geschriftenbescherming!" *Kluwer Copyright Blog*, March 6. <https://copyrightblog.kluweriplaw.com/2013/03/06/goodbye-geschriftenbescherming/>.
- — —. 2018. "Chapter 3: Against 'data property.'" In *Kritika: Essays on Intellectual Property* vol. 3, edited by Hanns Ullrich, Peter Drahos and Gustavo Ghidini, 48–71. Cheltenham, UK: Edward Elgar. <https://doi.org/10.4337/9781788971164>.
- Kaur, Jasmin, Seyed Mehdi Hazrati Fard, Mohammad Amiri-Zarandi and Rozita Dara. 2022. "Protecting farmers' data privacy and confidentiality: Recommendations and considerations." *Frontiers in Sustainable Food Systems* 6: 903230. <https://doi.org/10.3389/fsufs.2022.903230>.

- Lashmet, Tiffany. 2015. "Big Data on the Farm (Part II): What Laws Might Protect It?" *Texas Agriculture Law Blog*, September 8. <https://agrilife.org/texasaglaw/2015/09/08/big-data-on-the-farm-part-ii-what-laws-might-protect-it/>.
- Mark, Ryan. 2019. "Ethics of Using AI and Big Data in Agriculture: The Case of a Large Agriculture Multinational." *The ORBIT Journal* 2 (2): 1–27. <https://doi.org/10.29297/orbit.v2i2.109>.
- Perry, Mark and Thomas Margoni. 2010. "From Music Tracks to Google Maps: Who Owns Computer-Generated Works?" *Computer Law & Security Review* 26: 621–29.
- Ritter, Jeffrey and Anna Mayer. 2018. "Regulating Data as Property: A New Construct for Moving Forward." *Duke Law & Technology Review* 16 (1): 220–77. <https://scholarship.law.duke.edu/dltr/vol16/iss1/7/>.
- Sadiku, Matthew N. O., Tolulope Ashaolu and Sarhan Musa. 2020. "Big Data in Agriculture." *International Journal of Scientific Advances* 1 (1): 44–48. <https://doi.org/10.51542/ijscia.v1i1.9>.
- Stepanov, Ivan. 2020. "Introducing a property right over data in the EU: the data producer's right – an evaluation." *International Review of Law, Computers & Technology* 34 (1): 65–86. <https://doi.org/10.1080/13600869.2019.1631621>
- Sykuta, Michael. 2016. "Big Data in Agriculture: Property Rights, Privacy and Competition in Ag Data Services." *International Food and Agribusiness Management Review* 19 (A): 57–74. <https://doi.org/10.22004/ag.econ.240696>.
- Uddin, Mahatab, Ataharul Chowdhury and Muhammad Ashad Kabir. 2022. "Legal and ethical aspects of deploying artificial intelligence in climate-smart agriculture." *AI & Society* 39 (1): 221–34. <https://doi.org/10.1007/s00146-022-01421-2>.
- Uddin, Mahatab and Saleemul Huq. 2020. "Protecting Soft Adaptation Technologies Under Intellectual Property Rights Systems." *Intellectual Property and Technology Law Journal* 25 (1): 19–36. <https://doi.org/10.2139/ssrn.3905294>.
- Upbin, Bruce. 2013. "Monsanto Buys Climate Corp For \$930 Million." *Forbes*, October 2. www.forbes.com/sites/bruceupbin/2013/10/02/monsanto-buys-climate-corp-for-930-million/?sh=16f3107f177a.
- Van Asbroeck, Benoit, Julien Debussche and Jasmien César. 2017. "Building the European Data Economy." Data Ownership White Paper. London, UK: Bird & Bird. [https://sites-twobirds.vulture.net/1/773/uploads/white-paper-ownership-of-data-\(final\).PDF](https://sites-twobirds.vulture.net/1/773/uploads/white-paper-ownership-of-data-(final).PDF).
- Wiens, Kyle. 2015. "We Can't Let John Deere Destroy the Very Idea of Ownership." *Wired*, April 21. www.wired.com/2015/04/dmca-ownership-john-deere/.
- 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* 90–91 (1): 1–10. <https://doi.org/10.1016/j.njas.2019.04.007>.
- Yu, Peter K. 2019. "Data Producer's Right and the Protection of Machine-Generated Data." *Tulane Law Review* 93 (4): 859–929. <https://scholarship.law.tamu.edu/facscholar/1318>.