

Political Risk Assessment

The Right to Repair in Agriculture: A Risk Assessment of Canada's Bill C-244

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Figure 1: A wheat combine harvester

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Executive Summary

The passage of Bill C-244, a piece of right-to-repair legislation in Canada, may affect various stakeholders in the agri-food industry. The legislation directly impacts farmers and agricultural producers, aiming to unlock the potential for efficient and cost-effective repair solutions for their machinery. Conversely, equipment manufacturers have a vested interest in maintaining control over the repair market and protecting their intellectual property. Independent equipment repair shops and equipment dealers seek to provide competitive repair services without restrictive original equipment manufacturer (OEM) policies. Financial institutions and trade partners may also be affected as a result of the proposed change to domestic legislation. As a general point of interest, policymakers should be cognizant of those impacted by right-to-repair legislation. There is a heightened responsibility in how such legislation is enacted and enforced. Right-to-repair laws should balance the interests of all stakeholders, especially considering the broader vitality of the agriculture industry. This report aims to provide an overview of the risk implications of Bill C-244 and propose associated mitigation strategies for stakeholders.

As such, this report touches upon the following areas:

- The legislative context of Bill C-244
- Risks as a result of legislative scope and associated mitigation strategies
- Direct technological risks and associated mitigation strategies
- Risks to economic stakeholders and associated mitigation strategies

Bill C-244: Context

Background

The agricultural industry has undergone significant transformation in recent decades, driven by rapid technological advancements and the adoption of increasingly sophisticated machinery and equipment. Such technological innovations have enhanced existing farming practices, enabling farmers to increase crop yield and reduce waste and unnecessary costs. Currently, in Western Canada, the majority of commercial farmers use one or more digitally integrated applications, with almost all farmers employing GPS guidance systems as well as real-time monitoring on combine harvesters.¹ The growing reliance on highly complex machinery and software has raised some concerns about producers' right to repair and maintain their purchased equipment, as well as agri-tech firms protection of intellectual property (IP) rights, particularly in the context of proprietary technology and manufacturer software restrictions. In aiming to protect corporate innovation while ensuring accessible, equitable repair solutions for farmers, one must consider several key risks.

Amid the growing concerns from consumer rights advocates about the prohibition against third-

party repair interventions, the Canadian government has taken a step toward legislating the “right to repair” in the form of Bill C-244, currently undergoing Second Reading in the Senate at the time of writing. The bill proposes to amend the *Copyright Act* and “allow the circumvention of a technological protection measure in a computer program,” in essence, empowering consumers to a legislated “right to repair.”² This legislation aims to facilitate the diagnosis, maintenance, and repair of products. By championing owners' "right to repair," Bill C-244 addresses a critical barrier faced by many consumers, including those in the agriculture sector. It seeks to dismantle the economic and operational constraints imposed by anti-circumvention laws, which have entrenched manufacturers' control over repairs, thereby affecting the autonomy and innovation of Canadian agriculture, as well as stifling competition in the repair market.³ The proposed amendments potentially give provinces some latitude needed to enact amendments to consumer protection statutes without infringing on the federal government's jurisdiction over intellectual property.⁴

The will for this legislative change stems from a broader political momentum for the “right to repair.” *Bill C-244*, a Private Member’s Bill, was passed through the House of Commons unanimously. Before the proposed amendments, the *Copyright Act* protected digital locks on software and hardware for pieces of machinery, and it also allowed agricultural manufacturers to prevent “add-ons” (i.e., ‘shortlining’) to their equipment. Implicitly, these strictures made it exceedingly difficult for owners to repair their equipment or to alter equipment to innovate new uses and applications. The growing prevalence of such digital locks in agricultural equipment underscores the urgency to adapt legal frameworks to reflect modern technological realities.⁵ Given this trend towards expanding consumers’ access to repair, this report discusses the risks emanating from the legislation, and some direct technological and economic risks that exist in Canada's agriculture industry.



Figure 2: The Canadian Senate

Risks as a Result of Legislative Scope

The core issue in the right-to-repair debate concerns the scope of technological ownership. Consumers purchasing agricultural equipment often find parts of the product are claimed as proprietary by the original equipment manufacturers (OEMs). This legal claim complicates the repair process, as modifying or replacing parts might infringe on OEM copyrights, leading to a dilemma between the right to repair and copyright laws. Therefore right-to-repair laws, such as Bill C-244, carry much potential to significantly impact the issue of ownership in agricultural equipment. Historically, OEMs have asserted proprietary claims over specific parts of their products, creating a legal and operational framework where the equipment that farmers purchase cannot be freely repaired or modified by the producers. This has been further entrenched and protected by existing copyright law in Canada prior to the Bill.⁶ This proprietary framework means that even after purchasing the equipment, farmers may not fully own it in a functional sense, as they are restricted from making certain repairs or modifications. Further, if consumers choose to undertake repairs, then such repairs may void warranty claims. Additionally,

necessary repair manuals, parts, tools, software, or structured data may not be available to independent dealers or farmers.

Right-to-repair laws aim to clarify the extent of ownership rights for consumers, including farmers. By legally defining the rights of equipment owners to repair, modify, or replace parts of their machinery, these laws can challenge the traditional constraints imposed by OEMs' proprietary claims. If passed, this legislation may ensure that once farmers purchase equipment, they possess both the physical machinery and also the right to repair it as needed. Bill C-244 amends the *Copyright Act* to carve out protections for those “who circumvent a technological protection measure for the sole purpose of maintaining or repairing a product.”⁷ Note that the language of the bill does not explicitly protect the right of agricultural producers or equipment dealers/repair shops to access required technology for the purpose of repair. In this sense, the bill does not offer proactive, ‘positive’ protections for consumer stakeholders, but instead outlines a ‘negative’ right. To highlight the importance of this legislative change, a McKinsey and Company study reported that “ninety-nine percent of contractors and 95 percent of farmers say that it is somewhat or

very important to have access to their equipment data.”⁸

The proposed legislation offers limited protection by only allowing circumvention of the technological protection measures for maintenance or repair purposes without ensuring the availability of necessary tools, parts, or information. This gap in legislation means that while farmers may legally bypass specific technological barriers, they may still lack the practical means to repair their equipment effectively. Therefore, one risk is that this bill may not have sufficient scope to protect consumers, and could in fact serve to uphold the status quo in favour of the manufacturers. The broader right-to-repair movement advocates for more comprehensive laws that would require OEMs to provide access to repair manuals, diagnostic tools, software updates, and parts.⁹ This would empower farmers and independent repair shops to fix equipment promptly and affordably, reducing downtime and promoting sustainability by extending the lifespan of machinery. Appropriate legislative action should center on balancing copyright protection with ensuring that consumers, particularly in the agricultural sector, have the practical ability to maintain and repair their equipment independently.

It is also the case that there are limited manufacturer protections embedded within Bill C-244. Armed with new rights to repair their equipment, consumers may inadvertently associate manufacturers with any damage resulting from unauthorized repairs that may not be readily apparent due to software malfunctions or improper assembly. Additionally, there is legitimate concern that third parties entering the repair market could gain access to proprietary technology and trade secrets, which are traditionally safeguarded by the manufacturers.¹⁰ This risk manifests with the bill's lack of comprehensive scope, which poses a significant challenge to OEMs, who might argue that opening up access to their technology to third-party repair firms could compromise the integrity and security of OEM products and legal/financial liability. Furthermore, manufacturers contend that this scenario could lead to a proliferation of substandard repairs, potentially undermining the reliability and safety of agricultural equipment.



Figure 3: An agribusiness loading bay

Mitigations

As discussed above, a potential solution to some concerns with the bill in its current form would be for policymakers to expand the scope of right-to-repair legislation. A pertinent example of this approach is found in a proposed amendment in Prince Edward Island (in Committee as of March 2024) to the provincial *Farm Machinery Dealers and Vendors Act*. P.E.I.'s *Bill 110*. Proposed in January of 2024, this amendment requires equipment manufacturers to provide farmers with free repair manuals, and to supply parts as well as software and tools at a fair price.¹¹ One sees that legislative mitigation strategies should focus on removing barriers that prevent farmers from

accessing the necessary equipment repair and maintenance resources while ensuring that these measures do not inadvertently or unduly infringe upon intellectual property rights. An effective mitigation for such risks related to the legislation's scope could adopt a balanced approach that respects the rights of OEMs over their IP while also empowering farmers with the ability to repair equipment.

This could include establishing a regulatory framework that mandates OEMs to license their repair tools, software, and parts to independent repair shops and/or farmers at reasonable terms, as outlined in Bill 110. Furthermore, the legislation could stipulate certain transparency requirements, such as obliging OEMs to disclose when and how their technological protection measures affect the ability to repair equipment.

While Bill 110 has the potential to expand current protections in P.E.I., another pertinent example is New York State's 2023 *Digital Fair Repair Act*, which expands manufacturer protections. The *Act* guarantees that both third parties and consumers can perform repairs while also allowing manufacturers a degree of control over device data security protections. Additionally, this legislation protects the original manufacturer from any liability for any damage to the

product caused by third-party repair. As well, the law permits manufacturers to provide assemblies of parts instead of separate components, thereby allowing overall technological cohesion to be maintained.¹²

This policy approach comprehensively enhances farmers' self-sufficiency and also regulates and stimulates competition in the repair market, potentially lowering costs and improving service quality. Ultimately, a well-crafted right-to-repair law for agricultural producers should promote innovation, support sustainable practices, and ensure that farmers have timely and affordable access to repair services, thus safeguarding their operational efficiency and productivity. It should also allow manufacturers to bring their own innovation and repair capacity to market in a reasonable manner and shield them from any liability that may arise from after-market repairs.



Figure 4: Sustainable farming

Direct Technological Risks

If Bill C-244 receives Royal Assent, Canada's agri-tech industry will likely be significantly influenced by this right-to-repair legislation aimed at dismantling economic and operational constraints imposed by anti-circumvention protections. The next section explores some key technological risks associated with the open-endedness of this legislation, and reviews some related mitigation strategies that are available to stakeholders.

The bill's possible effect on farm equipment repairability is of particular interest. However restrictive OEM technology locks are, there tended to be an integrated, end-to-end customer service, diagnostic, and repair ecosystem - with specialty industry experience diagnosing and fixing contemporary equipment according to industry standards. Farm equipment with complex electronic parts and specialist software requires a high degree of skill. Farmers may find themselves highly dependent, if not a constant engagement with software and mechanical skills needed, on after-market repair due to this transition, particularly given the lack of incentives in this legislation for manufacturers to provide training

data or manuals. The relative open-endedness of this bill may result in a potential loss of network and system integration and a lack of compliance with industry standards.

A degree of interconnectedness in agricultural equipment has been brought about by technological improvements, enabling real-time data monitoring and analysis. Although this connectivity facilitates decision-making and increases operational efficiency, it also puts the equipment in danger of cybersecurity attacks if after-market repairs are attempted. Advanced agricultural equipment is already at risk for cyber-attacks.¹³ Farm machinery may be vulnerable to cyberattacks due to the integration of software and communication systems, which could disrupt operations and compromise confidential data. Completely allowing for equipment repair from independent dealers and shops presents a mechanical and cybersecurity risk if there is potential loss of manufacturer network and system integration, necessitating a multifaceted risk mitigation strategy.

Several types of agricultural equipment house a microprocessor that manages the device. The *Bill*

allows for repairs to bypass digital controls for diagnostic and repair purposes. In various types of tractors, microprocessors help ensure compliance with emission standards in order to adhere to the *Canadian Environmental Protection Act*.¹⁴ The microprocessor accomplishes this in part by constraining certain features of the engine. After-party modification of engines to bypass these constraints and boost performance often cannot be done without manipulating the emissions control software. Canadian emissions mandates may find it increasingly hard to maintain standards, particularly with respect to after-market repairs, when consumers are free to tinker with the software and engine with no repercussions.

Consumers often seek to modify their equipment to increase their performance rates. However, manufacturers already have pre-determined internal processes that regulate speed and acceleration to abide by environmental and safety rules and regulations. Equipment manufacturers must install parts that limit the emissions of nitrogen oxides and various other contaminants that aim to elongate the equipment's use. Allowing for self-alterations, such as engine-tuning, may unintentionally violate industry standards.¹⁵

Moreover, the development of autonomous agricultural technology is intimately linked to the evolution of Canada's farm equipment business. The reparability issues intensify as the agriculture industry embraces precision agriculture through autonomous gear.¹⁶ Due to the heavy reliance of autonomous agricultural equipment on artificial intelligence, sensors, and complex control systems, repairs are typically a specialist process requiring access to proprietary software and algorithms in addition to technical skills. The intricacy of autonomous systems prompts questions regarding farmers' and local experts' capacity to troubleshoot and repair these sophisticated devices efficiently, especially considering that other, more pressing, sector operations may have to be dealt with.¹⁷ Self-education regarding the knowledge to repair such systems may be a considerable time and cost sink

Efficient repair ecosystems are critical when dealing with a vital sector such as agri-food. Concerns with equipment performance degradation are raised when dealing with loss of manufacturer support and updates or dependence on unofficial and third-party solutions. Complicated farm machinery may experience problems with software bugs,

malfunctioning sensors, or interaction with other digital components, unlike traditional equipment, where mechanical issues were previously easier to resolve without specialty industry expertise. Repairability thus becomes a multifaceted problem with factors linked to both software and mechanics.



Figure 5: Repairing farming equipment

Mitigations

A comprehensive approach is necessary to mitigate the risks discussed. For farmers, policymakers, in tandem with manufacturers, could design a comprehensive curriculum to specifically target the specialized abilities needed to identify and fix the complex parts of autonomous machinery. These courses should cover a wide range of topics, from basic mechanical knowledge to software coding and diagnostics expertise. Maintaining agricultural output requires a qualified workforce, which is more

important as complex agricultural machinery grows in popularity.¹⁸

With this sentiment, autonomous equipment makers must work with the larger agricultural community to implement transparent regulations that facilitate farmers' access to the information, resources, and equipment they need to repair autonomous gear. By working together, it may be possible to create standardized diagnostic interfaces that will make it easier for local technicians/dealers and farmers to interact with and comprehend the intricate systems in agricultural equipment. Developing integrated systems for agriculture using open-source principles could lead to improved repairability standards and mitigate longevity concerns. Open-source platforms make the software architecture transparent, making it easier for farmers to comprehend and alter the code. This promotes a community-driven approach to resolving software-related issues, making independent troubleshooting easier.¹⁹

After-market repairs to complicated farm equipment heighten concerns about cybersecurity. Because of their interconnectedness, these systems are vulnerable to malicious assaults that could jeopardize the integrity of the machinery or the data it produces.

Manufacturers need to prioritize cybersecurity measures, such as strong encryption, safe data transfer methods, and frequent vulnerability patch updates. Governments should create cybersecurity guidelines tailored to autonomous farming technology, in line with the consumer-side curriculum, guaranteeing that agricultural producers take precautions against online attacks.

Clear and comprehensive communication of government policy is a significant factor in determining how effectively farm machinery may be repaired and

how much it stays in line with industry standards and regulations. Farm equipment cybersecurity issues need to be addressed with a mix of technological and policy-based solutions. Equipment manufacturers must give top priority to including a full IT inventory strong cybersecurity features in their products.²⁰ Governments can simultaneously impose cybersecurity requirements on farm equipment, guaranteeing that farmers follow industry best practices and have defenses against online attacks.



Figure 6: Drone being used in farming

Economic Risk

The unfettered ability of farmers to repair advanced equipment could have several implications regarding Canada's commitment to various trade obligations. Most notably, Canada has signed on to a number of obligations with respect to digital trade. The issue is specifically with what is referred to as "source code" in the *Canada-United States-Mexico Agreement (CUSMA)*, as well as the *Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)*. Canada must guarantee secrecy for proprietary software's source code - beyond what the scope of domestic law and/or free-trade agreements may already protect. Pre-existing trade obligations mean that Canada currently cannot compel manufacturers to allow access to diagnostic tools, source code, or "digital keys."²¹

On top of the *USMCA* and *CPTPP* obligations to agricultural equipment manufacturers, Canada maintains a broader commitment to various digital trade agreements, such as the *Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)*.²² *Bill C-244* and its proposed carveout for consumers' right to repair may come at odds with the

requirement that Canada guarantees a certain level of protection for IP rights to companies, such as large agricultural equipment manufacturers. This presents a level of risk to lawmakers in that they may be limited with respect to providing 'positive,' proactive consumer protections/rights to farmers.

The expanded ability for farmers to repair their own equipment under *Bill C-244* may also present challenges to domestic stakeholders, namely, independent repair shops as well as financial institutions. The literature has shown that where production costs are high, such as in agricultural equipment, manufacturers may respond to expanded consumer repair rights by offering free repair services. Repair services may increase the implicit valuation of a product, where consumers are more likely to buy a product with integrated repair and support, along with a perceived longevity of the product.²³ There may be an immediate risk to independent agricultural machinery repair shops in that they may be undercut or completely priced out by equipment manufacturers. If farmers can more quickly and cheaply repair their equipment, the useful life of these machines could extend, potentially

maintaining their trade-in value for longer. Financial institutions may need to adjust their loan products' terms and conditions to account for changes in the depreciation rate of the equipment, considering current models are based on capital cost allowances, capital recovery methods, optimal life, and ownership costs, among other factors.²⁴

The terms of replacement based on current prices vs. depreciated values may be altered due to the prolonged lifespan and maintained value of agricultural equipment, and amortization schedules could be altered. Longer equipment lifespans could lead to longer loan terms or adjustments in structuring financing deals. Lenders and insurance providers may also need to reassess the risk associated with financing/insuring agricultural equipment, as improved repairability could reduce downtime and increase productivity for farmers, potentially improving their ability to repay loans. However, lenders and agricultural insurers may also need to consider potential risks if farmers perform repairs improperly, leading to equipment failure. The expanded repair ability for farmers could lead to significant changes in how financial institutions approach financing for agricultural equipment, requiring adjustments in

valuation practices, loan terms, risk management, insurance offerings, and market strategies, among others.



Figure 7: Agriculture shipping

Mitigations

As was mentioned in the first section of this report, there needs to be a clarification of the scope of the bill. A clear definition of what constitutes a "right to repair" should be established to ensure that it does not infringe upon the "source code" or digital keys protected under international trade obligations. A potential structure to this approach would be to delineate the bill's scope to exclusively mechanical repairs while excluding access to proprietary software, aligning it with international commitments. As a more proactive solution, the Canadian government should also develop a framework, in tandem with the passing of *Bill C-244*, for ensuring fairly priced licensed access to diagnostic tools and software, where farmers and repair shops obtain permissions under strict conditions that prevent the dissemination of proprietary

information. While this may just be an extension of the existing status quo, fair access must be a priority for policymakers. A balance between international obligations and Canadian farmers' ability to repair effectively must be struck. With respect to the broader right to repair, fostering collaboration between agricultural equipment manufacturers and the agricultural sector to create more repair-friendly policies and practices could reduce the need for legislative intervention. This collaboration could lead to voluntary agreements that balance the right to repair with the protection of intellectual property, thereby reducing the potential for trade conflicts and promoting a more sustainable approach to agricultural equipment maintenance and repair.

With respect to agricultural lenders and insurers, it may be appropriate to develop new financial products that accommodate the changing depreciation rates and risks, such as flexible payment schedules or performance-based financing. Risk assessment models should also be re-evaluated to consider the potential for improved equipment conditions, farmer productivity, and the risks of improper self-repair. This also means accounting for the potentially lower risk of equipment failure due to better maintenance and repairability. If

farmers choose to opt out of manufacturer-offered repair, incentives should be offered to those who undergo certified training for equipment repair, reducing the risk of improper repairs and, consequently, decreasing the risk profile for lenders/insurers. Agricultural insurance providers could also consider introducing tailored insurance products that cater to the new dynamics of equipment use and maintenance, such as policies that cover equipment and repair-related liabilities. Agricultural lenders and insurers would be well advised to stay current with existing and upcoming right-to-repair legislation in Canada, such as Bill C-244, leveraging the opportunities it presents while managing the associated risks.



Figure 8: John Deere inventory

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