

Growing with AI

**Key Challenges for
Washington Agriculture in
the Age of AI**

Prepared by the Washington State Academy of Sciences (WSAS). July 2026.

This document describes seven key challenge areas that emerged from WSAS's *Growing with AI* initiative. These challenges form the basis of WSAS's first-ever open Call for Ideas, which seeks to surface promising concepts and innovations to help Washington agriculture thrive in the age of AI.

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Background

For generations, Washington farmers have been pioneers and national leaders in agricultural productivity and diversity, with 300+ commodities and a production value of \$12.9 billion¹ built on ingenuity and resilience. Today, that resilience is being tested: the state lost more than 3,700 farms between 2017 and 2022 (an average of two a day)² and in 2024 ranked last in the nation for farm profitability, with operators collectively losing \$295 million.³

Today's producers are facing unprecedented and compounding pressures:

- **Water is less reliable.** Four consecutive drought emergencies since 2023 have cut supplies in key growing regions, particularly the Yakima Basin.⁴
- **Margins are inverting.** Over the past decade, Washington's farmers have watched their profit margins fall to the lowest in the country while their production costs climbed faster than anywhere else in the nation.¹
- **Labor is scarcer and more expensive.** Wages for seasonal agricultural workers rose 36 percent between 2018 and 2024 as the farm workforce shrinks.⁵
- **Complexity keeps compounding.** Farmers navigate requirements from more than a dozen agencies while global competition and geopolitics create additional uncertainty.

These pressures are real and urgent. At the same time, artificial intelligence (AI) is rapidly evolving, and its effects are already being felt in agriculture. This creates a window of opportunity, and Washington is uniquely positioned to lead: the state is home to world-class agricultural expertise and one of the nation's foremost technology sectors. In agriculture, AI tools have the potential to sharpen decision-making, reduce costs, and help farmers navigate increasingly complex growing conditions and markets. But realizing that potential is not straightforward. AI tools must be designed and deployed thoughtfully, with attention to who benefits, who bears the risk, and what happens when systems fail. This necessitates approaches that maximize benefits while actively reducing harm.

To better understand how AI might impact agriculture, the Washington State Academy of Sciences (WSAS) offered an online webinar series and convened a workshop in April 2026 that brought together more than 50 researchers, farmers, AI developers, policymakers, funders, and innovators. From those conversations emerged seven challenge areas that, if addressed, would help Washington agriculture become more productive, resilient, and economically viable in the age of AI:

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1. Washington State Department of Agriculture. (2026). *Washington Agriculture at a Crossroads: A Baseline Assessment of Agricultural Viability*. <https://cms.agr.wa.gov/WSDAKentico/Documents/Pubs/AGR5-2512-009-AgViabilityStudy.pdf>
 2. U.S. Department of Agriculture, National Agricultural Statistics Service. (2024). *2022 Census of Agriculture - State data: Washington* (Volume 1, Chapter 1, Table 1). https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1,_Chapter_1_State_Level/Washington/st53_1_001_001.pdf
 3. Weaver, M. (2025, December 4). *Washington ranks last in farmer take-home pay in 2024*. Capital Press. <https://capitalpress.com/2025/12/04/washington-ranks-last-in-farmer-take-home-pay-in-2024/>
 4. Washington State Department of Ecology. (n.d.). *Drought response*. Retrieved July 31, 2026, from <https://ecology.wa.gov/water-shorelines/water-supply/water-availability/statewide-conditions/drought-response>
 5. Diaz, R. (2025, February 18). *Can Washington's agriculture industry survive on H-2A workers?* Cascade PBS. <https://www.cascadepbs.org/news/2025/02/can-washingtons-agriculture-industry-survive-h-2a-workers/>

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- Creating a data-sharing framework to support farmers, research, and policy
 - Developing tools to help farmers test new innovations
 - Building the education and training support infrastructure farm managers and workers need
 - Making planting and investment decisions in the face of a changing climate
 - Enabling more efficient water use and allocation across Washington's agricultural system
 - Streamlining the regulatory environment for both efficiency and increased compliance
 - Matching agricultural needs to new research and technology development

Data Sharing Framework

How might Washington design a data-sharing framework for Washington agriculture that improves farm efficiency, accelerates research, and informs policy?

Farms are generating data at an unprecedented scale, from soil sensors and yield monitors to connected machinery and satellite imagery, with additional data contributed by researchers, government agencies, and third-party providers, such as drone companies and satellite-data providers. This expansion in data holds enormous promise, particularly in an era where AI depends on data to generate value. However, unlocking this potential requires a unified infrastructure where stakeholders collaborate and share information systematically.⁶ Some benefits of coordinated data sharing could include: identifying patterns across farms that spur innovation and shape policy, increasing economic viability for farmers through timely insights, developing better risk management tools, and reducing the environmental footprint of farming practices.

Although data exchange already occurs in various forms, the data sharing ecosystem remains in its early stages, constrained by a limited understanding of its full business and impact potential.⁷ At the farm level, for instance, sharing takes time, trusted pathways for it rarely exist, and the benefit to the individual grower is often unclear. Adding another layer of complexity, sharing between neighboring farms and counties serves a different purpose than sharing with state agencies and researchers, and each needs its own mechanisms.

Significant gaps in the standards, incentives, and protections must be addressed to make data sharing and integration possible:

- **Interoperability and standards:** Devices and platforms produce data in incompatible formats, making it difficult for systems to exchange information.⁶ In a 2024 study of Washington apple growers, 62% reported that they struggle with systems that won't communicate with each other.⁸ Without shared standards, data from different tools cannot be combined or compared.
- **Data integration and availability:** Even when systems can connect, combining weather, soil, yield, and market data into a single useful picture requires significant additional technical work, including robust platforms and timely data feeds that most operations do not yet have.¹ Moreover, there may be data gaps that need to be solved to achieve integration.
- **Data protections:** Farmers need confidence that shared data will be used ethically and securely, and that they retain ownership and control over how it is accessed and monetized. Without clear ownership rules and enforceable protections, concerns about misuse and exploitation remain among the most prominent barriers to participation.⁹

Coordinated data sharing, in combination with responsible use of AI technologies, stand to transform how agricultural data is generated, exchanged, and acted on. A more unified, coordinated infrastructure could turn today's fragmented data into insights that drive on-farm efficiencies and innovation, assist with environmental and human safety protections, and ease regulatory burdens.

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6. Šestak, M., & Copot, D. (2023). Towards Trusted Data Sharing and Exchange in Agro-Food Supply Chains: Design Principles for Agricultural Data Spaces. *Sustainability*, 15(18), 13746. <https://www.mdpi.com/2071-1050/15/18/13746>
 7. IDH / Intellect. (2024). *Unlocking Data Sharing in Agriculture*. Digital Ecosystems Coalition for Empowering Smallholder Farmers. <https://www.idhsustainabletrade.com/uploaded/2024/01/Unlocking-Data-Sharing-in-Agriculture-January-2024.pdf>
 8. Bolduan, R. (2024). *Robotics-Ready Data Standard for Washington Apples* [Final Report]. Yamaha Agriculture / Washington Tree Fruit Research Commission. <https://treefruitresearch.org/report/robotics-ready-data-standard-for-washington-apples/>
 9. Yu, Z., et al. (2025). Agriculture Technology Providers' Perspectives of Data Rights and Obligations. *Sustainable Futures*, 9, 100585. <https://www.sciencedirect.com/science/article/pii/S2666188825001558?via%3Dihub>

The opportunity areas below are meant to inspire, not prescribe. The best ideas may come from directions we haven't anticipated. We welcome ideas that address one area or span several.

Shared Standards and Context

How might we make the data farmers already generate work together to inform more precise, relevant insights?

Most farm data is locked in incompatible formats and stripped of the context that makes it meaningful, so it cannot be combined or trusted across tools.

Ideas in this area could include:

- Common standards that let tools from different providers exchange data
- Metadata standards so shared data carries how, why, and how accurately it was collected
- Neutral platforms that aggregate farm data in a consistent and reusable form

Trust and Farmer-First Value

How might we give farmers clear benefits from sharing data and confidence it won't be used against them?

Farmers hold back when the payoff is unclear, when they are left out of system design, and when they are uncertain how their data might be used.

Ideas in this area could include:

- Pilots that bring farmers, technologists, and government together around one concrete use case, such as repair costs or input use, to show benefit directly to the farmer
- Data governance models that let farmers capture a greater share of the value created from their data
- Education that helps farmers collect usable data and learn where sharing can pay off

Data Ownership

How might we ensure farmers retain ownership and control of their data as it moves through integrated systems and different use cases?

Ownership is largely governed by contracts, voluntary codes carry no enforcement, and farmers are often left without a clear understanding of how their data can be used and by whom.

Ideas in this area could include:

- A clear, actionable roadmap of shared principles and governance, co-developed with farmers, technologists, and government
- Plain-language data agreements that define ownership and use, with protections against misuse
- Long-term investment in convening and trust-building as technology evolves

Ag Decision Support Tools

How might AI help farmers test new innovations for their specific needs to inform their investments?

Agriculture producers regularly evaluate investments in new technologies, inputs, and practices to improve productivity, manage costs, and sustain operations. Sound investment decisions require time, data, and the analytical capacity to assess whether a given technology is suited to a specific farm's conditions. But Washington's tree fruit industry has documented that the growing volume of available technologies has created a heavy burden of identification, evaluation, and decision-making for individual producers.¹⁰

Producers face an additional challenge in assessing the reliability of available information. Washington growers have experienced cases in which companies introduced technologies with unmet performance claims and subsequently exited the market, contributing to skepticism toward emerging tools.¹⁰

In Washington, only 34% of farms reported positive net cash farm income in 2022,¹¹ leaving the majority with little room to absorb the cost of a failed investment. AI could offer new capacity to support these decisions, enabling producers to assess the likely impact of an investment before committing resources.

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Problem-centered evaluation

How might we help farmers identify and evaluate solutions based on their specific on-farm problems rather than company marketing claims?

Even when evidence exists that a new technology, input, or practice delivers results, its value depends on whether it addresses the right problem for a specific operation. This will require farm-specific analysis rather than general product claims.

Ideas might include:

- AI-assisted tools that help producers articulate and prioritize their specific operational challenges before evaluating any technology
- Models that take a farm's own historical data and project the payback of a specific investment over time
- Digital twins and simulations, validated with real farm data, that test technologies and practices against a farm's specific conditions virtually before adoption

Shared testing infrastructure

How might Washington's research institutions, industry, and government coordinate to build resources for evaluating new technologies, inputs, and practices under real Washington farm conditions?

10. Washington Tree Fruit Research Commission. (2023). *Technology Roadmap*. https://treefruitresearch.org/wp-content/uploads/2024/02/WTFRC-Technology-Roadmap_Final.pdf

11. USDA National Agricultural Statistics Service. (2024). *2022 Census of Agriculture — Washington State* (Table 5: Net Cash Farm Income). https://www.nass.usda.gov/Publications/AgCensus/2022/Full_Report/Volume_1_Chapter_1_State_Level/Washington/

Today, independent evaluation of new technologies, inputs, and practices against real farm conditions is rare. Most evidence available to producers comes from the companies selling the product.

Ideas might include:

- Shared test beds where new technologies, inputs, and practices are evaluated against current alternatives under real Washington farm conditions
- Digital twins validated with real farm data that allow developers to stress-test solutions before going to market
- A recognized home for independent evaluation so farmers know who to trust and vendors know what standard they are being held to

Financial access

How might farmers of all sizes test technologies and practices without risking capital they cannot afford to lose?

Implementing new technologies and practices requires upfront capital investment and tolerance for uncertain returns that many Washington operations find difficult to absorb given slim margins on economic returns.

Ideas might include:

- Small grants and state-supported pilot programs that let smaller operations test technologies and other practices, especially where adoption supports state goals
- Shared access models, such as test farms or sensor kits, that let farmers evaluate tools on their own conditions without purchasing them

Upskilling Farmers and Farmworkers

How might Washington update the education and job training infrastructure for farmers and farmworkers to adapt in the age of AI?

Washington agriculture faces a growing workforce challenge including a shrinking labor supply, an aging producer population, and rising labor costs. As a major producer of labor-intensive specialty crops, Washington requires more agricultural labor than most states. Yet that labor is becoming harder to find. Fewer domestic workers are interested in seasonal farm work, resulting in a 465% increase in Washington's reliance on the H-2A guestworker program, the federal program for temporary agricultural workers, since 2013. The producers who run these farms are also aging, averaging 59.3 years of age. At the same time, labor has become the largest production expense for Washington farms, with costs rising 117% between 2016 and 2024, more than double the national average.¹²

The current workforce needs support to adapt to a changing industry, improve efficiency and safety, and retain experienced knowledge. Producers, farmworkers, and extension agents need opportunities to build familiarity with emerging technologies such as AI, understand their limitations, and develop the skills necessary to use them. Most farmers do not have the time or support to incorporate AI into their operations while also keeping their operations running. Farmers need help understanding what problems are ripe for AI solutions, a better sense of the tools out there, and solutions that fit their budget. Trusted intermediaries like agriculture extension agents can be helpful, but may lack the digital knowledge needed to effectively bridge that gap.

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AI adoption support on farms

How might we build a scalable support system that accompanies farmers and farmworkers through the adoption of AI tools without disrupting ongoing farm operations?

It is difficult to make a digital transition while keeping operations running. A key barrier is not just awareness of tools but the ability to configure and use them most effectively for a specific farm's context.

Ideas in this area could include:

- Trained adoption agents working directly with farms across the state, extending what Extension can offer
- Tools that help farmers configure AI systems for their specific operation so they get useful outputs from day one (e.g., digital twins)

Peer learning spaces to support adoption

How might we create a trusted space for Washington farmers and farmworkers to share what works, so that knowledge spreads across farms and regions rather than staying siloed?

Many farms are starting to experiment with and integrate AI tools, but currently everyone is figuring it out on their own. There is no trusted infrastructure to aggregate and share it. Farmers are more likely to trust outcomes reported by peers than by vendors or researchers.

12. Washington State Department of Agriculture. (2026). *Washington Agriculture at a Crossroads: A Baseline Assessment of Agricultural Viability*. <https://cms.agr.wa.gov/WSDAKentico/Documents/Pubs/AGR5-2512-009-AgViabilityStudy.pdf>

Ideas in this area could include:

- Benchmarking tools that let farmers see how peers are using technology and what results they are getting
- Peer networks where early adopters share what is working and build collective confidence in new tools
- Methods to capture practical on-farm knowledge and make it accessible across the sector

AI training for the workforce

How might AI tools help farmers transfer knowledge to their workers in the flow of everyday farm operations?

Today, worker training on farms is largely informal, time-consuming, and hard to scale. The most promising tools will connect farm-specific knowledge to structured training, so that a farmer and experienced farmworkers can generate and contribute to farm-specific training materials.

Ideas in this area could include:

- AI tools that generate worker training modules from farm-specific data across tasks such as pruning, irrigation, or pest management
- Digital assistants that guide workers through a task in real time
- Tools that make compliance and safety training easier to deliver and track across a seasonal workforce
- Approaches that incentivize and reward sharing of tacit or place-based knowledge to develop AI tools that benefit current and future workers

Climate Resilience

How might AI help Washington growers make confident planting and investment decisions in the face of a changing climate?

Crop diversity is one of the strengths of Washington's agriculture sector. The state's varied growing zones support more than 300 commodities. However, changes in weather and climate are already affecting this production. A 2024 WSDA climate-resilience survey found that over 70% of respondents had seen their operations disrupted within the previous five years by stressors including extreme heat, drought, wildfire smoke, shifting weather, and weakened crop yields.¹³

Shifts in climate also create new opportunities. Warmer temperatures and longer growing seasons could open the door to new kinds of production and expand market opportunities. For example, a longer season could make double-cropping possible or allow growers to raise crops currently suited to warmer climates.¹³ Washington is also relatively well-positioned compared to many other states: its temperate climate, surface-water availability, and extensive irrigation systems could make it an increasingly important source of food production as conditions shift.¹⁴

Adapting to new conditions requires long-term planning. WSDA's report notes that crop-suitability planning depends on more research into drought- and heat-tolerant crops and on on-farm resilience strategies.¹³ AI could support that work by learning from regions whose present-day climate resembles Washington's projected future, and drawing on their lessons to match crops and livestock to Washington's future conditions, reducing the risk for growers who trial new crops on their own land. AI has the potential to inform how Washington farmers plan, experiment, and make long-horizon decisions about what to grow and raise next.

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Future Crop Viability

How might AI give Washington farmers reliable, place-specific guidance on which crops, varieties, and livestock systems will thrive under projected future conditions so they can make confident, long-horizon decisions?

Many farmers face deep uncertainty about which crops and livestock systems will remain viable as growing conditions shift. Warmer temperatures and longer seasons could open new opportunities but realizing those requires advance planning.

Ideas might include:

- Models linking climate projections to crop suitability at the farm and county level, accounting for soil type, elevation, and water availability
- High-throughput genotype-to-phenotype mapping to accelerate identification of heat- and drought-tolerant varieties for perennial and annual crops
- Probabilistic forecasting tools that communicate what is certain versus still unknown, giving growers actionable ranges rather than single-point predictions

13. Washington State Department of Agriculture. (2025). *Climate Resilience Plan for Washington Agriculture*.

<https://cms.agr.wa.gov/WSDAKentico/Documents/Pubs/AGR2-2502-003-ClimateResiliencePlanWA-Ag.pdf>

14. Washington State Department of Agriculture. (2026). *Washington Agriculture at a Crossroads: A Baseline Assessment of Agricultural Viability*. <https://cms.agr.wa.gov/WSDAKentico/Documents/Pubs/AGR5-2512-009-AgViabilityStudy.pdf>

Grower-Led Transition and Compensation

How might AI derisk the piloting of new crops or systems on growers' own land, so the broader community benefits from their experimentation?

Transitioning to new crops or systems is risky for individual growers and the community loses when farmers who might pioneer change cannot absorb the cost of failure. Growers need support structures, compensation mechanisms, and visible champions to make transformation feasible.

Ideas might include:

- Compensation or insurance mechanisms for growers who voluntarily trial new varieties, crop types, or mixed systems on their own land
- Support structures including capital access, knowledge networks, and visible champions to help operations of all sizes manage transition costs and risks
- An ecosystem of collaborators, researchers, investors, insurers, growers, and extension services, coordinated around shared learning goals
- A place where growers who do try new varieties, crops or growing strategies to capture their learnings so that others can benefit from their experience.

Comparable-Region Learning

How might we help Washington growers learn from agricultural regions already experiencing Washington's future climate?

Regions that already face Washington's projected future conditions hold hard-won knowledge about what works and what doesn't. Connecting Washington growers to those communities, through data and in person, can compress the learning curve and reduce the risk of transition.

Ideas might include:

- AI tools that identify and match comparable regions based on climate, soil, and water profiles to enable targeted knowledge exchange
- Study tours and field partnerships with communities already navigating similar transitions, giving growers a concrete vision of possible futures

Water Use Optimization

How might AI enable smarter water use and allocation across Washington's agricultural system?

Washington State's \$12.9 billion agricultural economy depends on irrigation, with 80% of all freshwater withdrawals going to farms.¹⁵ That supply is under growing pressure. Droughts are becoming more frequent, driven by low snowpack and precipitation deficits that reduce summer water availability, when irrigation demand is at its peak.¹⁶

2026 is the fourth consecutive year that Washington is under a drought emergency.¹⁶ In the Yakima Basin, water-right holders are forecast to receive just 44% of their normal supply.¹⁷ By the 2050s, projections show that seven out of every ten years will see snow droughts on average, compared to just one in five in the 1990s.¹⁶

When water runs short, crops fail, orchards die, and farming families lose their livelihoods. Yet at every level of the water system, there are significant gaps in the tools, information, and incentives needed to manage this challenge effectively:

- **On the farm**, farmers are making irrigation decisions with incomplete information, often applying more water than crops need because the risk of under-irrigating is too high, and the evidence-informed precision tools that could help are out of reach for most small and medium-size operations.
- **When it comes to water trading**, farmers who have water to spare cannot easily transfer it to those who need it more. Water markets can be slow and costly to navigate driving willing buyers and sellers away, leaving water capacity underutilized while crops fail elsewhere.
- **At the watershed scale**, irrigation districts, tribal nations, and regulators are making allocation decisions without integrated, real-time data on how water moves through the system, leading to inefficiencies, allocation conflicts, and missed opportunities to distribute water where it is needed most.
- **In policy and incentives**, current policies and programs were designed to secure and protect water rights, and conservation incentives were not their original focus. As a result, farmers who reduce water use may see few direct rewards, and some may worry that conserving could affect their rights.¹⁸

AI stands to address gaps in how water is managed, traded, allocated, and conserved across Washington agriculture.

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On-Farm Water Intelligence

How might AI help farmers apply the right amount of water at the right time?

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15. Washington State Department of Agriculture. (n.d.). *Water Quantity*. <https://agr.wa.gov/departments/land-and-water/natural-resources/water-quantity>
 16. Washington State Department of Ecology. (2026, April 8). *Statewide drought declared due to dismal snowpack*. <https://ecology.wa.gov/about-us/who-we-are/news/2026/april-8-statewide-drought-declared-due-to-dismal-snowpack>
 17. Washington State Department of Ecology. (2026, March 5). *Drought Response: Statewide Emergency Declaration*. <https://ecology.wa.gov/water-shorelines/water-supply/water-availability/statewide-conditions/drought-response>
 18. Washington State Department of Ecology. (n.d.). *Water Rights*. <https://ecology.wa.gov/water-shorelines/water-supply/water-rights>

Many farmers lack the data and tools to make precise irrigation decisions, and the precision technologies that could help are too expensive for most small and medium-size operations.

Ideas might include:

- AI-driven irrigation scheduling linked to soil moisture sensing and satellite-based estimates of crop water use, integrated with farm management systems
- Cooperative models that pool costs to install sensors, data networks, and irrigation controls, making technology accessible to farms that cannot afford it individually
- Improved seasonal forecasting focused on the metrics most useful to irrigators. Seasonal timeliness, location specificity, and projection period duration all matter for crop and irrigation planning.

Water Market and Allocation Efficiency

How might AI make it faster and less costly for farmers to lease or transfer unused water to those who need it most?

Water markets in Washington move slowly and cost a lot to navigate, so water often sits unused on one farm while crops fail on another.

Ideas might include:

- Digital platforms that reduce the time and cost of leasing unused water to other farms, cities, or industries
- Water banking tools compatible with Washington's Trust Water Rights Program so farmers can conserve water without losing their rights

Watershed-Scale Decision Support

How might AI give irrigation districts, tribal nations, and regulators a shared, real-time picture of water capacity and flow through the system?

Irrigation districts, tribal nations, and regulators are making critical allocation decisions with fragmented data and no shared framework.

Ideas might include:

- Integrated platforms combining farm-level, district-level, and watershed-level data currently operating in isolation, including digital twins, forecast capabilities, and spatiotemporal products
- AI models for snowpack, streamflow, and groundwater recharge that give managers subseasonal visibility into water availability

Policy and Incentive Innovation

How might AI help design and implement incentives that reward farmers for conserving water without putting their water rights at risk?

Existing policies and programs offer limited incentives for conservation and few rewards for farmers who reduce water use.

Ideas might include:

- Tools that help farmers identify and qualify for existing conservation incentives and programs, reducing the uncertainty and paperwork that discourage participation

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- Policy analysis tools that help regulators understand system-wide impacts of water transactions, including effects on tribal reserved rights

Reducing Compliance Burden

How might AI help to reduce compliance burden for both farmers and regulators while strengthening protections for workers, consumers, and the environment?

Farmers are governed by an overlapping network of thousands of different and often overlapping regulations from more than a dozen separate agencies.¹⁹ This weight shows up in hours spent on paperwork instead of planting and in compliance decisions made without adequate guidance. For example, choosing how much fertilizer to apply and when, requires understanding multiple federal, state, and local regulations related to clean water, nutrient management, fertilizer registration, and recordkeeping requirements. These burdens are often most challenging for small and specialty crop farms, which have less staff capacity and often need to comply with rules designed for much larger operations.

AI stands to address gaps in how regulatory information is gathered, interpreted, and acted on across Washington agriculture.

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Smarter Compliance Tools

How might AI help farmers understand, track, and demonstrate compliance across multiple agencies without adding to their administrative burden?

Farmers navigate requirements from multiple agencies with overlapping, sometimes conflicting rules. There is no single system that tells them what regulations apply to their operation, tracks what has changed, or consolidates what they need to show.

Ideas might include:

- A single compliance platform where farmers enter their operation details once and the system maps which regulations apply, tracks changes, and flags conflicts between agencies
- AI tools that consolidate requirements from multiple agencies into plain language that farmers can act on

Cross-Agency Coordination

How might AI enable infrastructure that lets agencies coordinate, reduce compliance burdens, and keep rules aligned with their intended goals?

Today, agencies that administer agricultural regulations largely operate in silos. Current policies often don't allow data sharing or assessment about how rules perform once they're in place, which locks agencies into duplicate effort and leaves farms navigating conflicting requirements.

Ideas might include:

- Shared data infrastructure built across agencies rather than each agency building separately
- Tools that map overlapping or conflicting requirements across agencies so farms aren't navigating

19. Washington State Legislature. (2026). *Engrossed Substitute House Bill 2238 — Senate Bill Report* (as passed Senate, March 5, 2026). <https://lawfilesexternal.wa.gov/biennium/2025-26/Pdf/Bill%20Reports/Senate/2238-S.E%20SBR%20APS%2026.pdf>

duplicate or contradictory rules

Better Data for Better Policy

How might AI give legislators and agencies farm-level information about the real impact of proposed regulations before they are enacted and measure their actual effects once in place?

Regulatory decisions are often made without quantified, farm-level data on their effects, especially for small farms. Agencies also often lack the tools to know whether a policy is achieving its intended goal, protecting workers, the environment, or consumers, or producing unintended consequences. Better tools to estimate and assess impacts could support adaptive management and improve Washington's agricultural policy.

Ideas might include:

- A digital twin (a computer model that simulates how a real farm or policy environment works) that lets farmers and policymakers run scenarios before a bill is enacted
- Tools that model the farm-level productivity and profitability impact of proposed regulations before they are enacted
- Monitoring tools that track real-world outcomes after implementation, enabling agencies to adjust course if a policy isn't achieving its intended effect or is creating unforeseen burdens

Matching Agricultural Needs to Research and Technology

How might AI help ensure Washington farmers' real problems inform research and technology development?

Between 2015 and 2023, the number of university extension faculty, who bring research and technical advice directly to farmers, fell by nearly 36%.²⁰ At the same time, producers consistently report a shortage of locally relevant research and technical assistance to guide their decisions. Further, the computer science and engineering specialists developing new tools often do not understand agriculture. They are often drawn to other sectors or develop tools without an understanding of the real problems, which inevitably fail.

The opportunity is not only more research but a better innovation ecosystem for agriculture. Producers would benefit most from technology developed in concert with the people who will use it, rather than built in isolation from the farm.²⁰ Agriculture practitioners need opportunities to opt into research and technology development programs that are personally valuable and reward them for testing new technologies and sharing data.

AI stands to make research and technology more impactful by keeping researchers and technologists grounded in what farmers actually need, from how their problems are captured to how solutions are tested and delivered back to the farm.

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On-Farm Testing and Iteration

How might AI let researchers and developers test ideas with real farmers and improve them quickly, before committing to large-scale adoption?

Farmers on thin margins cannot afford to be early adopters of unproven technology, and developers cannot get the grounded field feedback they need, so promising tools stall before they reach the farm.

Ideas might include:

- Shared testbeds or innovation hubs that pair developers with producer test sites, providing sensing infrastructure, data, and agronomic expertise to de-risk early trials
- Systems that aggregate and protect on farm data across many farms, letting developers iterate quickly and farmers see what works across similar operations
- Shared-cost pilots or outcome-based incentives that lower the barrier for farmers to participate in testing

On-Field Problem Capture at Scale

How might AI gather the real, on-the-ground problems farmers face and turn them into clear priorities that researchers and developers can act on?

20. Washington State Department of Agriculture. (2026). *Washington Agriculture at a Crossroads: A Baseline Assessment of Agricultural Viability*. <https://cms.agr.wa.gov/WSDAKentico/Documents/Pubs/AGR5-2512-009-AgViabilityStudy.pdf>

Producers report a shortage of locally relevant research, a sign that the work being done does not always reach the problems they most need solved.

Ideas might include:

- Platforms that capture unmet needs from growers through voice, text, or field reporting and synthesize them into research and development priorities funders and institutions can act on
- Tools that help extension agents and researchers surface the most common and pressing challenges across a distributed farming community

Research Translation to Farm

How might AI close the loop by getting research and technical guidance into producers' hands, especially as extension capacity shrinks?

As public research and extension capacity declines, fewer professionals are available to translate research into guidance and deliver it to the farms that need it.

Ideas might include:

- Tools that translate complex research into practical, farm-specific guidance for producers who lack the time or background to engage with it directly
- Systems that extend the reach of a smaller number of extension professionals across more farms and regions
- Platforms that help commodity commissions and extension services track what guidance reaches producers and whether it changes outcomes