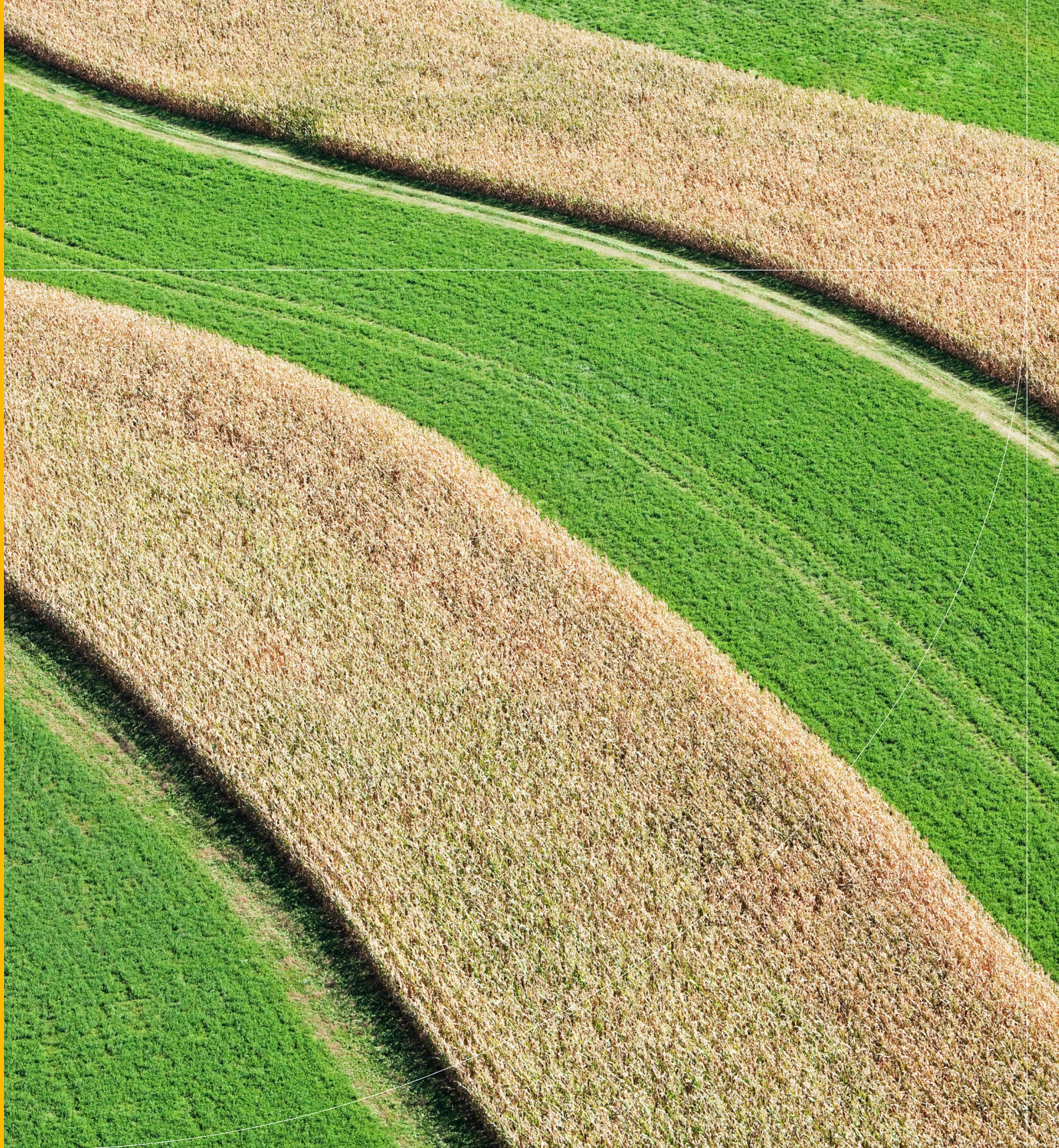


Building the Missing Market: A National Strategy for American Agriculture

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American agriculture has never been more productive. It has also never been more fragile. Those two facts are not a coincidence.

Net farm income has become dependent on large, irregular government payments and volatile livestock cycles just to stay near its historical average. The agricultural trade surplus that defined American economic leadership for decades is gone, replaced by a deficit that grew to a peak of \$41 billion in fiscal year 2025.¹ The country has lost nearly 150,000 farms in five years.² Roughly 70% of all U.S. farmland will change hands in the next 20 years.³ Farmers and ranchers die by suicide at three and a half times the rate of the general population.⁴ Taken together, the numbers describe a farm economy under growing strain.

This report is built around that diagnosis and a strategic response centered around a fundamental shift in how success in American agriculture is measured — from yield per acre to risk-adjusted profit per acre.

That means how much a farmer actually keeps from each acre, and how reliably they keep it, once every cost and every risk is accounted for. The pages that follow trace where the market is missing, why it has stayed missing, and what it would take across policy, capital, and institutions to build it within a decade.

Getting there will require investors, food companies, technology firms, policymakers, and the farmers and rural communities already experimenting with what works and who need the rest of the system to finally show up around them.

Many of the pieces already exist. What is missing is the market structure that connects them. The window to act is open, and it will not stay open indefinitely. 🚫

How We Got Here



For 50 years, American agriculture has increasingly narrowed its measure of success to one simple metric: how much of a few crops a farm produces per acre (yield).

By that measure, the system has been a triumph. American farmers grow more bushels and pounds per acre, on less land, with fewer people, than any generation before them.⁵

By almost every other measure that matters to the people doing the growing, the system is more fragile than it looks. Net farm income, after reaching an all-time record in 2022, has become significantly more dependent on large, irregular federal payments and volatile livestock cycles just to stay near its historical average.⁶ The country has lost nearly 150,000 farms in five years.⁷ Farmers are aging out of the profession faster than new ones can afford to enter it, and far too many farmers do not see a future for their children in farming.⁸ The losses extend beyond farms to families, legacies, rural communities, and an agricultural future.

The conventional explanation is that farming is simply a hard business, exposed to weather, volatile commodity prices, and forces no policy can fully tame. Much about that explanation is true, but it's incomplete. It does not explain why a farmer who wants to grow something healthier, more resilient, or more valuable than the subsidized crops so often cannot - not because those other crops won't grow, but because there is no one to sell it to, no price that reflects what it's worth, and no lender willing to finance the years it takes to make the switch. In other words, the market for a more diverse and resilient agriculture is missing in action.

Ask a corn and soybean farmer in Iowa why they don't grow something else, and the answer is rarely "I don't know how." It's "there's no elevator that will buy it." The seed exists, the soil can support it, and the know-how is closer than most people assume. What's missing is the market that would meet a farmer on the other side of the farm gate, and any market for a crop requires three things: a buyer, a price, and a place to sell it. American agriculture is short all three, and has been for a long time.

Understanding this missing market does not require ignoring all that has been built and accomplished. It is to understand how we have allowed the system to narrow itself, and in some cases even encouraged it to do so through policies with unintended consequences. It is also to understand how little of this has been the fault of the farmer and, in fact, how little of it was to the benefit of the farmer.

The U.S. built an extraordinarily effective market for the subsidized commodities, complete with elevators, processing capacity, crop insurance, export infrastructure, futures markets, and technological advances, much of it through nearly a century of policy decisions. Like putting all of your eggs in one basket, that market system can work, but only for fewer and fewer players and only until something happens to the basket. When the world changes, input costs spike, consumers want different foods, soil health begins to carry financial value, or global competitors change the economics, farmers still have strong reasons to keep producing what the established channels reward, even when they would prefer another path.

The Technology Treadmill

Agricultural economist Willard Cochrane's term for the dynamic in which farmers must constantly adopt new technology just to maintain their income: early adopters capture a brief advantage before everyone else catches up and prices fall back to where they started.

The missing market diagnosis adds another pressure. Farmers are running faster to stand still while the number of viable alternatives continues to shrink.

Markets are only part of the picture. In some cases, the innovation already exists, but remains inaccessible to farmers. Biological crop protection, precision application tools, AI-enabled decision systems, and soil health diagnostics are, in many cases, commercially available. But access to them is uneven and often expensive, advisory support to use them well is scarce, rural connectivity is frequently too weak to run them, and the farmers most likely to benefit are often the least equipped to evaluate and adopt them on their own. In those cases, creating demand solves only part of the challenge. Farmers still need a practical way to use what already exists.

In practice these two failures often compound each other. A farmer with no alternative market has no cushion to risk an experiment, even with a tool that works, so a missing market removes a buyer and forecloses access simultaneously. The categories are analytically distinct, but on the farm, they are frequently the same trap.

It is also important to remember that these items are only tools; tools help produce the crop, but do not do the work themselves and can and should be replaced when they fail to be effective or better tools come along. Closing an access gap gets a farmer the tool itself. Both are necessary. Missing markets and uneven access to innovation are related but distinct failures, and conflating them would paper over what actually needs fixing.

This helps explain the contradiction at the center of American agriculture. The same farmer, operating the same land, can rank among the most productive in the world and still be financially fragile.

The productivity is undeniable, and so is the puzzle it should embarrass us into asking: if American farms are this productive, why do farmers not profit, and why do consumers increasingly struggle to afford what those farms produce? The answer is that the value created at the farm is increasingly captured elsewhere in the value chain - in the layer between the farm and the grocery store, the middle that owns the elevators, the processing plants, the distribution networks, the input companies and the brands, and that has consolidated enough market power to capture the spread on both ends of the transaction at once. The market and the tools that would let farm-level productivity translate into durable profit for farmers, and affordable food for everyone else, are not fully there.

This report is organized around that diagnosis. Section by section, it asks what market is missing or what innovation is out of reach, and why. Who would build it, or who would deliver it, if the incentives were right? And what would it take - in policy, in capital, in institutions - to close the gap within the next 10 years?

Addressing these challenges requires a deliberate, decade-long project to build the markets American farmers, including the next generation, need to thrive. We also seek to close the gaps in access that keep them from using the tools and innovations that already exist, so that the next generation of farmers is rewarded not for how much they produce, but for how much value, resilience, and health they create with what they grow.

That shift - from yield per acre to risk-adjusted profit per acre - is the measure this report uses throughout. It means, simply, how much a farmer keeps from each acre, and how reliably they keep it, once every cost and every risk is accounted for. 🔄

A farm sector earning durable profit from a wider range of crops, sold into real markets, is also a farm sector with less reason to depend on the narrow, concentrated middle that drives up what consumers pay at the register.

What the Market Is Missing



No Buyer: The Health and Nutrition Market That Doesn't Exist

Consumer demand for healthier food is real, and it is growing. Walk the aisles of any major grocery chain and the evidence is everywhere - reformulated products, "clean label" claims, expanding produce sections, and a steady stream of new entrants promising less processing and more nutrition. Food companies are responding to this, reformulating products and searching for ingredients that match where consumers are headed.

Demand creates an opportunity, but without reliable supply and market infrastructure, that opportunity remains unmet.

Food manufacturers want nutrient-dense ingredients they often cannot find domestically at the scale and consistency they need. Farmers, meanwhile, have little visibility into that demand. They continue growing what the existing system already rewards - the handful of commodities for which an elevator, a price, and a buyer all reliably exist - because nothing tells them, credibly and in advance, that growing something else would be repaid. Without purchase commitments, growers have little reason to plant crops whose domestic supply remains thin. Food companies see that limited supply and hesitate to commit. Imports often fill the resulting gap.

This is a pure case of a missing market in American agriculture. It is not that anyone has done anything wrong. It is that no one built the institution whose job it would be to connect the two sides - the way an elevator connects a corn farmer to a grain buyer, instantly and as a matter of course. For nutrient-dense crops, that institution simply does not exist at scale.

Even with a buyer, planting something new carries material production risk. Specialty crops, legumes, and other nutrient-dense rotations are not corn or soy with better marketing. They can bring unfamiliar pest pressure, different harvest windows, different storage and handling requirements - and the innovation and agronomic know-how to manage that risk is unevenly distributed. A farmer who wanted to grow something outside the dominant commodity system would be starting closer to zero than a casual observer might assume, not because farmers are incapable of learning, but because innovation and financial tools have not focused on these crops. The extension networks, crop consultants, and peer knowledge that exist in depth for the dominant commodities simply don't exist at the same depth for everything else, and are especially thin in regions that have not historically grown them.

That leaves growers facing two linked hurdles. Without a committed buyer, an operation has little cushion to absorb the cost of learning a new crop over its first few years. Without reliable agronomic support, even clear demand may not be enough to make that crop viable. Each hurdle makes the other harder to overcome.

The same dynamic connects directly to soil health. A farm with healthier soil has a structurally lower cost base and a higher long-term asset value, and many of the production systems that build soil health - diversified rotations, cover crops, reduced chemical reliance - are the same systems that would produce the nutrient-dense crops this market is missing. Building the market for healthier food, closing the knowledge gap that keeps farmers from growing it, and building healthier soil are, in large part, the same project, attacked from three different directions.

Soil as a balance sheet item

Every percentage point of soil organic matter holds **20-30 pounds of nitrogen** and up to **20,000 gallons of usable water** per acre.

Building that bridge requires two different things to happen at once, not one thing called "support." Food companies have to be willing to sign multi-year offtake agreements through the cooperatives, aggregators, and regional processors that consolidate supply before the supply exists, because no farmer will plant a crop on the promise of a buyer who hasn't committed to anything. Government has to expand risk management tools to cover those crops, because no farmer will take that planting risk if a single bad year wipes out the gain. Private purchase commitments and public risk coverage serve different purposes, but together they give growers a credible reason to make the change.

The clearest starting point is stronger connective infrastructure between willing sellers and buyers, paired with enough support for growers to manage the production risk. Building both is one of the clearest, highest-leverage places to start closing the missing market in American agriculture.

No Price Signal: When the Farmer Has No One to Negotiate With

Profit compression at the farm level does not happen in a vacuum. Concentration across the agricultural value chain plays a substantial role, both above and below the farm gate.

On the input side, a small number of companies control most of the seed genetics, crop protection chemistry, and fertilizer supply available to American farmers. A wave of mergers over the past decade has left four companies accounting for the majority of global seed and pesticide sales.⁹ A farmer with limited alternatives for seed genetics or crop protection chemistry has little leverage over the price offered.

On the output side, the picture is just as concentrated. Four companies process roughly 85% of U.S. beef, and similarly tight concentration exists in pork, poultry, and grain handling.¹⁰ In many regions, a farmer has one or two realistic buyers for what they grow. Those same companies, the large processors and traders, however, also stand to benefit from the volume a more diversified agricultural system could generate.

A price means little when the seller has no viable alternative buyer.

In the middle, sitting between these two concentrated layers, are the cooperative networks and regional ag retailers that could, in theory, give farmers some collective leverage back. In practice, most of these organizations still function primarily as input retailers, selling products by volume. Their incentives are aligned with throughput, not with the farmer's bottom line, which means the one layer of the system positioned to push back against concentration on both sides has instead, for the most part, settled into the same logic as everyone else.

Farmers therefore buy from concentrated input industries and sell into similarly narrow channels, with limited ability to negotiate on either side. Whatever is left over, after land costs, debt service, and weather risk take their share, is what passes for farm income. That gap has not closed. Input costs that reset sharply after 2022 have stayed elevated, while commodity prices for corn, soybeans, and wheat have fallen 25% to 35% from their 2022 peaks, depending on the crop, and production expenses across the farm sector remain near record levels.¹¹ There is no structural mechanism inside the current system that pushes back on either side of that gap.

This is not a market failure in the textbook sense, but rather the predictable result of letting concentration accumulate on both sides of a transaction without ever asking what it would do to the person standing in the middle. Adam Smith, the 18th-century Scottish economist and author of *The Wealth of Nations*, warned that concentrated interests would always seek to tilt the rules of exchange in their favor, and that the cost would be paid by whoever stood at the other end of the transaction. The American farmer has been standing there for 50 years.

Better technology alone does little to improve bargaining power when transparency, competition, and leverage remain limited. The two failure modes converge in the cooperative and retailer layer, which has defaulted into selling volume instead of outcomes but is also best positioned to deliver agronomic advice, biological alternatives, and precision tools to farmers who cannot access them on their own. Fixing that layer's incentives - turning these organizations from input retailers into Farm Systems Integrators that profit when farmers earn more rather than when farmers buy more - would do double duty: restoring some price leverage and opening a channel for innovation access at the same time.

Any serious effort to improve farm profitability has to account for concentration. A 10 year strategy that improves risk management, expands diversification incentives, and builds transition finance - but leaves concentrated input and output markets untouched - will see its gains captured upstream and downstream before they ever reach the farm.

No Financing: The Capital That Doesn't Exist Yet

Across other industries, purpose-built financing has repeatedly helped turn a promising shift into a lasting one. Healthcare, energy, and education each show the same pattern - the technology and the demand both existed well before adoption took off, and adoption only took off once financial products were designed specifically for how that sector operates - not adapted from some other sector's lending model and hoped to fit.

Agriculture has never had that moment. The sector has high capital requirements, genuinely unusual risk, and a pressing need to shift toward more diversified, higher-margin production, and a financing architecture still built for a production model that no longer fits the moment. Crop insurance, revenue protection, and conventional input financing all serve important functions, but their structures primarily support current production. They offer far less flexibility during a multi-year shift to something new. For a farmer already absorbing volatile input costs and thin margins on rented land, that gap can make staying where they are the rational financial choice.

Unpaid Operating Debt Carried Forward¹²

5% → **31%**

2023 Early 2026

Not a sign of farmers taking on strategic investment debt, but of a sector increasingly unable to settle its accounts at the end of a season.

This is a missing market in the most literal sense. The financial products a transitioning farmer would need, such as credit that recognizes soil health and diversified rotations as collateral, repayment structures tied to profitability rather than fixed schedules, or patient capital for the years before a new system pays for itself, mostly do not exist yet at meaningful scale. Where pieces of the right products do exist, scattered across specialty lenders and mission-oriented funds, most farmers have no clear way to find them, qualify for them, or evaluate whether they're a good deal. Even available financing can therefore remain functionally out of reach if growers cannot locate, understand, or confidently evaluate it.

Public and private capital have different parts to play here. The government's role when focused on food security and economic resilience is to absorb the risk that private lenders won't take on a new, unproven model. They provide guarantee frameworks, loan backstops, and risk-sharing structures that make a transition loan something a bank can justify underwriting. Private capital's role is what markets do better than government programs: designing the actual products, moving at the speed a farmer's planting calendar requires, and scaling what works once it's proven. A program that is only public risk-absorption with no private product design behind it will be too small and too slow. A private market with no public backstop will price transition risk so high that few farmers can afford to use it.

The Investment Case¹³

~10%

average annual return on U.S. farmland since 1990 (NCREIF Farmland Index), with lower volatility than stocks

Roughly half of these returns come from cash income (rent or lease payments) and half from the land simply becoming more valuable over time. Most investments either pay you steadily or grow in value, but farmland tends to do both at once. This does not make it risk-free - 2024 was the first year on record the index posted a loss. But the long-term pattern, not any single year, is what matters to an investor thinking in decades rather than quarters.

This is where investor interests and the reforms should line up. As farms shift toward more diversified, higher-margin production, and as soil health improves, well-managed farmland should become more valuable, creating a common interest between long-term capital and a healthier farm economy.

A harder question is what, specifically, this capital should be funding. The honest answer is capital that builds the markets, not capital that profits from the fact that they're missing. That means patient capital in transition financing that doesn't call a loan due before a new system has had the years it needs to pay off; capital that builds a new farmer's equity in land rather than just renting them access to someone else's; and durable, multi-year capital committed to the elevators, processors, and financing facilities that connect a farmer to a committed buyer, a transparent price, or a real way to use that acre.

The emphasis is on improving the underlying economics of the land and the operation instead of relying primarily on assembling, leveraging, and reselling the asset. That approach can still generate returns, with the investment paying off as the farm itself becomes more productive and financially durable over time.

Closing this gap is close to a precondition for nearly every other recommendation in this report. Every other reform described here - diversification, technology adoption, generational transition - requires capital that the current financing system was never built to provide. The specific products, structures, and institutional roles needed to close it are addressed in the policy toolkit.

No Market for the Land Itself: What an Acre Is Actually Worth

Biofuel policy has shaped American agriculture for more than two decades, with meaningful benefits. The Renewable Fuel Standard and related incentives created stable demand for corn and soybeans that supported farm income and rural infrastructure across the Midwest for a generation. Roughly 40% of U.S. corn production still flows to ethanol today.¹⁴

But scale creates its own kind of tension, and biofuels now sit at the center of a question American agricultural policy has never fully confronted: is the country's most productive land being put to its highest-value use? The economic structure of the biofuel supply chain answers part of that question on its own. Farmers supply the raw commodity. Most of the downstream value accrues to processors, refiners, and distributors - not to the farm gate. Large areas of prime farmland end up generating thin per-acre margins while the broader cost treadmill keeps grinding underneath them. Biofuels didn't create that treadmill, but at current scale, they reinforce it.

Biofuels already have a large, established commercial channel. Far fewer farmers can access alternative, often higher-value uses of the same acre - agrivoltaics, next-generation feedstocks grown on marginal land, and dual-use systems that pair energy production with continued farming. Where these alternatives have been tried, the economics are striking. Typical row-crop cash rent ranges from roughly \$150 to \$300 per acre per year, while a solar lease can generate roughly \$500 to \$2,000 per acre per year, depending on location.¹⁵

The pathway to a solar lease is not straightforward - only a small fraction of farmers have signed one.¹⁶ But for farms that have made the transition, the gap between what land earns under commodity production and what it could earn under a well-structured dual-use arrangement is substantial and can materially change the economics of the acre.

What's missing is not the technology - agrivoltaic systems and next-generation feedstock conversion both exist and work. What's missing is the market infrastructure that would let a typical farmer access them with confidence: regulatory standards clear enough to make dual-use land arrangements bankable, a validated pipeline of next-generation feedstock technologies moving from pilot to commercial scale, and the offtake agreements and risk management tools that would let a farmer commit to a new land use without betting the whole operation on it. Without that infrastructure, these options remain out of reach for most farms.

The government's job is to set the rules clearly enough that a dual-use land arrangement is bankable, including standards for agrivoltaic systems and an expedited regulatory pathway for next-generation feedstocks. Private capital's job is everything that follows. Energy developers and infrastructure funds are already moving toward agrivoltaic deals, and bioenergy companies are already capable of signing the offtake agreements that would make feedstock diversification financeable. The opportunity exists and sits close enough to reach, but clearer rules would put it within reach of far more farms than can access it today.

The broader principle is that land is a scarce, strategic asset, and its value should reflect how much durable value each acre returns to the person farming it.

Biofuels can remain part of that picture. But a system that routes premium farmland into thin-margin commodity production while concentrating most of the value somewhere downstream is not a system built for farmer prosperity, and closing the market for what that same acre could otherwise be worth is one of the more immediately achievable fixes in this entire report. 📌

Why the Gaps Persist



Profit Compression: The Cost of Standing Still

American farm income has become more dependent on government payments and livestock cycles than on the strength of the crops grown. That dependency did not appear overnight. It built up year by year, and it is likely to keep building unless something changes.

Net farm sector income reached \$182 billion in 2022 - the highest level on record, in both nominal and inflation-adjusted terms.¹⁷ It was also, by almost every account, an anomalous year shaped by residual pandemic-era support and commodity prices that spiked under conditions unlikely to repeat. Income fell over the next two years to roughly \$140 billion in 2024. That sounds like a crisis, and in important respects it was one. But the \$140 billion figure still sat above the prior decade's average. The more revealing story is the baseline it returned toward, one that was already too thin to absorb the costs farmers were carrying.

Income was widely expected to rebound sharply in 2025, with early forecasts approaching \$180 billion. It did not get there. USDA's most recent figures put 2025 net farm income closer to \$155 billion, a downward revision of roughly \$25 billion from where the year was expected to land - driven by weaker commodity markets outside of cattle, higher production expenses than projected, and disaster assistance payments that were authorized but had not yet been fully disbursed.¹⁸ Across these years, the farm economy has remained heavily exposed to livestock cycles and irregular federal transfers, even as crop earnings have struggled to keep pace with costs.

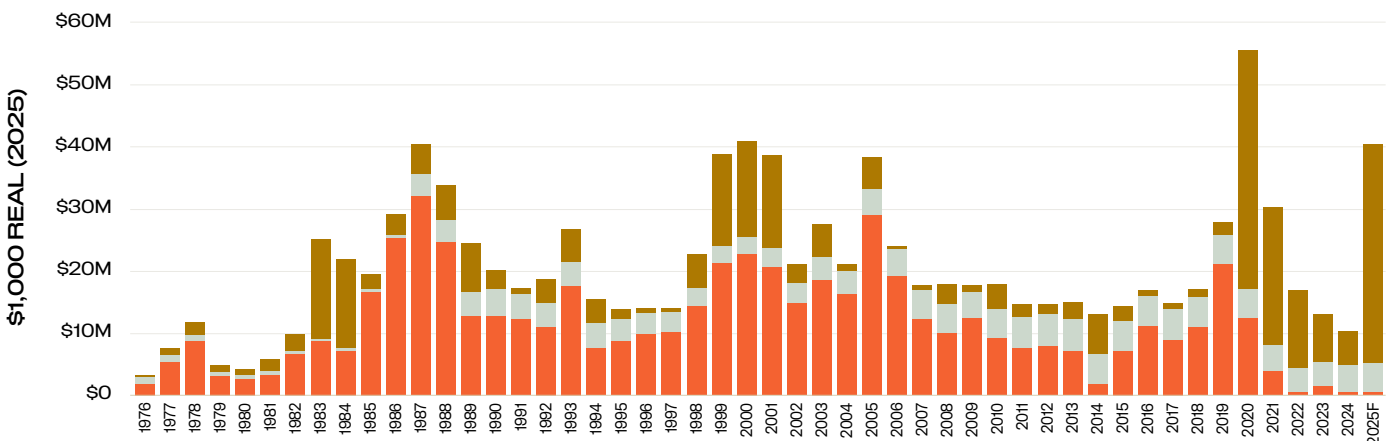
That last point is the one that matters most, and it gets lost easily in headline income numbers. Costs reset higher after the 2021–2022 input price spikes and have stayed there. Commodity prices for corn, soybeans, and wheat, meanwhile, have fallen well off their 2022 peaks. Production expenses are running near their highest level on record. A farmer doing everything right - planting on time, managing risk carefully, hitting strong yields - can still find that the math no longer works, because the gap between what it costs to grow something and what the market pays for it has not closed. It has just been temporarily papered over by government support in the years when that support has been large enough to cover it. The clearest evidence of how much work that support is doing: without government payments, projected 2026 net farm income would fall nearly 12%, to roughly \$109 billion.¹⁹ That makes the headline figure as much a reflection of federal assistance as of the underlying economics of farming.

This is the part of the story that should worry anyone thinking about the next 10 years, not just the last few. Government payments have functioned reactively in recent years, not because that is what they are inherently designed to do, but because reactive support is the main tool currently available to keep farmers afloat when a trade war, a weather event, or a price collapse hits. That tool shows up after the disruption to stabilize farm finances in the moment. It does not, and was never built to, fix whatever made the farm vulnerable to that disruption in the first place. And the more a farm's income depends on a payment that arrives unpredictably and at an amount no one can plan around in advance, the harder it becomes to make a confident long-term decision about anything: what equipment to buy, what innovation to invest in, what new crop to try, whether to invest in the soil this year or just get through it.

Exhibit 1.0

50 Years of Total Direct Government Payments to Farmers²⁰

■ Farm Programs
 ■ Conservation
 ■ Ad Hoc, Supplemental & Miscellaneous



These payments function more like a painkiller than a cure.

They dull the immediate financial pain without addressing what caused it, and in some respects they make the underlying problem worse. A meaningful share of federal payments flows through farmers to the rest of the input industry - money that effectively subsidizes continued spending on the same seed, chemical, and fertilizer programs driving the cost treadmill in the first place, rather than funding a way out of it. For many farmers, accepting that assistance is less a judgment about whether the approach works than a practical response to bills that come due regardless of commodity prices.

Repeated emergency assistance can also make structural change harder. When relief keeps the existing cost structure intact, less capital is available for investments that could lower expenses, diversify revenue, or reduce dependence on concentrated suppliers over time.

\$44.3B

Projected direct government farm program payments to U.S. producers in 2026²¹

None of this is an argument for pulling the safety net out from under farmers facing a genuine shock. It is an argument that a farm economy where the safety net has become the floor, rather than the exception, is not a resilient one, and that the billions in direct payments from the federal government are doing an enormous amount of work to obscure a problem that money alone cannot solve.²²

Rural Stress: The Generations Gap

The economic pressures facing American agriculture are not abstractions to the people living inside them. Their human cost is reflected in a stark statistic. Farmers and ranchers die by suicide at a rate roughly three and a half times higher than the general population.²³

Financial pressure is one part of a much more complex picture, particularly when a person's livelihood, family history, and sense of identity are closely tied to the farm.

The CDC confirmed a male farmer suicide rate of 52.1 per 100,000 in 2021.²⁴ That is higher than any comparable year on record, and striking specifically because 2021 was a commodity price recovery year. Prices had bounced. The crisis had not. What the data reveals is that the mechanism is not price alone. It is the accumulated weight of debt taken on during the 2012 boom, years of margins that couldn't cover production costs, and limited options for changing course. The cost treadmill is not a metaphor. For too many farmers, it is the last thing they were running on. That cost is compounding with a demographic reality that gets discussed too loosely, in ways that either overstate or understate what's happening.

A separate but related shift is happening in how that land gets farmed while it waits to change hands. Nearly 80% of all rented farmland in the U.S., roughly 348 million acres, is owned by landlords who do not farm it themselves.²⁸ More than half of these landlords have never farmed at all; about 40% simply inherited the land.²⁹ They collected \$34 billion in rental income last year, much of it on land that is fully paid off.³⁰

There may be nothing inherently wrong with that arrangement. A landowner does not need to be the one driving the tractor for the land to be well cared for, and plenty of non-farming owners, including larger institutions and wealthier families, take a genuine, long-term interest in how their land is managed, who farms it, and what condition it's in when the lease ends. The problem is ownership with no meaningful stake in the outcome: an owner who collects the rent check and asks nothing else, paired with a tenant on a one- or two-year lease who has every incentive to extract what they can this season and none to invest in what the soil will look like five years from now. Short lease terms can leave both parties focused on the current season, with no one clearly accountable for the land's condition several years out.

Layered on top of this is the harder problem of entry. Farmland values have climbed sharply, and getting a modern operation started requires substantial capital - equipment, working capital, and often a multi-year runway before a new operation breaks even.³¹ Retiring farmers frequently have no clear succession plan. Fewer than half of U.S. farmers report having any formal plan in place, even as two-thirds say they are approaching retirement and intend to transfer their land.³² Beginning farmers frequently have no clear path to the capital that would let them act even if a clear plan existed. That leaves many aging owners without a defined successor and prospective farmers without the means to step in.

None of this is being driven by any single villain. It is the predictable result of a land tenure system that grew up around renting as the path of least resistance for both sides - convenient for an aging, often absentee owner; the only available option for an operator who can't afford to buy. But a system where the dominant relationship to the country's most important long-term asset is a short-term lease between two parties with limited stake in its future is not a resilient system. It is a system quietly mining its own foundation.

ONE OF THE LARGEST GENERATIONAL TRANSFERS OF LAND IN U.S. HISTORY IS ALREADY UNDERWAY

58

Average American farmer age²⁵

40%+

Percentage of American farmland owned by people 65 years or older²⁸

~300M

Acres of U.S. farmland - roughly a third of the total - expected to change hands over the next 20 years²⁷

**THERE IS A VERSION OF THE NEXT DECADE
WHERE THIS GETS MANAGED WELL.**

**EXPANDING THE FINANCING TOOLS
AVAILABLE TO BEGINNING FARMERS**

↳ Shared equity models, cooperative ownership structures, and farmland access funds that lower the capital required to start an operation would give more new entrants a path to ownership rather than another year of renting.

LONGER LEASE TERMS

↳ Supported by federal incentives for landowners willing to offer five- to 10-year agreements instead of one or two, longer leases would give tenant farmers enough security to invest in the land rather than mine it for one more season's yield.

BETTER SUCCESSION PLANNING SUPPORT

↳ Legal, financial, and tax assistance available to families navigating a transfer, rather than letting confusion or inertia decide the outcome by default, would help land move toward someone who intends to farm it well, rather than fragmenting or sitting idle.

The most consequential decisions about the next 50 years of American farmland are being made quietly, on a year-to-year basis, by landlords and tenants, neither of whom may be thinking about the next 50 years at all.

Changing that, giving more of the people who actually work the land a meaningful stake in its future, is one of the more achievable, and most urgent, challenges in front of American agriculture today.



Chemical Uncertainty: Few Suppliers, Many Risks

Modern American agriculture runs on a remarkably small number of chemical tools. Herbicides like glyphosate and atrazine, along with nitrogen and phosphorus fertilizers, underpin productivity across hundreds of millions of acres. That alone would be a narrow foundation. What makes it a national security problem is who supplies it, and why, despite everyone in the system knowing this, so little has changed.

In February 2026, President Trump signed an executive order invoking the Defense Production Act to secure the domestic supply of elemental phosphorus and glyphosate-based herbicides.³³ The U.S. has exactly one domestic producer of elemental phosphorus and glyphosate, and that single producer's output falls well short of what the country needs. Whatever one thinks of the executive order itself, and it has drawn opposition, including from farmers who argue the country should be moving away from these chemistries rather than propping up their supply, the fact it responds to is not in dispute. Reliance on a single domestic producer for inputs used across millions of acres creates an obvious point of failure in the food supply chain.

Recent fertilizer shocks show how quickly that exposure can reach farmers. Fertilizer prices spiked sharply in 2021 and 2022, came down from that peak, and never returned to where they were before. In early 2026, conflict in the Middle East closed the Strait of Hormuz, a route that carries a large share of the world's nitrogen fertilizer and the raw materials used to make it, and nitrogen prices spiked again, with the World Bank projecting the broader fertilizer price index would rise more than 30% for the year.³⁴ The 2021–2022 shock was a preview - this preview has already repeated once, and the underlying geography that produced it has not changed.³⁵

The geography is the problem. China supplies close to half of the world's pesticide active ingredients and controls an even larger share of the raw manufacturing capacity behind them, including the technical-grade ingredients used to make glyphosate, atrazine, and several others.³⁶ That is a strategic dependency on the scale of what the U.S. faces in critical minerals and semiconductors. Those sectors have drawn billions in federal investment, export controls, and sustained legislative attention precisely because of how dangerous that concentration proved to be. Agriculture has drawn none of the same response, despite the fact that the practical stakes, a farmer's ability to plant, protect, and harvest a crop, and a country's ability to feed itself, are at least as immediate as a semiconductor shortage and considerably more difficult to manage once the supply fails.

The reason this dependency has persisted, despite being widely understood for years, is not a mystery. The regulatory and policy environment governing agricultural inputs, approval pathways for new chemistries and biological alternatives, domestic manufacturing incentives, and the rules under which existing products stay on the market, has been shaped heavily by the companies with the greatest financial stake in keeping it exactly as it is.

The largest agrochemical manufacturers spend more on lobbying than almost any other sector of the agricultural economy.³⁷ There are predictable consequences of allowing the companies most invested in the status quo to be the most influential voices in the room when the status quo is being debated.

Four companies — Bayer, Corteva, Syngenta, and BASF — control roughly 65% of global pesticide trade and more than half of the world's commercial seed market.³⁸ Bayer alone spent \$8.5 million on federal lobbying in 2024; CropLife America, the trade association that speaks for the sector, spent an additional \$1.3 million the same year.³⁹ They have a direct and well-resourced interest in slowing the approval of alternatives that would compete with their existing products, in maintaining the regulatory complexity that favors incumbents over new entrants, and in ensuring that the policy conversation about input security focuses on securing their supply chains rather than diversifying away from them.

Layered on top of the supply chain risk is a legal and political one that compounds it. Litigation over glyphosate has produced billions of dollars in settlement exposure.⁴⁰ Dicamba tells a similar story: courts have vacated its federal approval twice since 2020, leaving farmers without a legal way to use a product many had already purchased, only for the EPA to propose bringing it back, which has already drawn a new round of litigation.⁴¹ Farmers cannot plan a season around a tool whose legal status might not survive the season. The Make America Healthy Again movement and a broader public health constituency have intensified this scrutiny further. These pressures do not always point in the same direction. The debate around the 2026 executive order is a clear example, with some MAHA-aligned voices criticizing it as a step backward on exactly the question the movement cares most about. Whatever side of that argument one lands on, the larger point is that farmers, input companies, and investors are operating in an environment where the rules governing these chemistries can shift quickly, and a business model built around a single supplier and a single political consensus is not a sound long-term strategy for anyone.

Part of what has kept the toolkit this narrow is a regulatory pathway that works against the companies most likely to innovate. Getting a new chemistry or biological alternative from discovery to commercial approval can take a decade or more and costs hundreds of millions of dollars - a process designed around the scale and resources of the largest agrochemical companies. Small companies, which are often where the most genuinely novel alternatives originate, frequently cannot sustain operations through a regulatory timeline that long without revenue from a product that doesn't yet have approval. High development costs and long timelines can therefore reinforce incumbent advantage and make it harder for new products to reach farmers. Glyphosate was first registered for commercial use in 1974, and the U.S. now applies roughly 280 million pounds of it to cropland every year.⁴² Its continued scale of use underscores how slowly the agricultural input toolkit has changed.

None of this is an argument to abandon the tools farmers depend on today. Farmers need what works, and the chemistries under discussion have worked reliably for decades. The exposure comes from relying so heavily on a small set of products whose supply, ownership, regulation, and legal status are all concentrated.

The U.S. has shown it knows how to respond to this kind of strategic dependency when it decides the problem is serious enough. The CHIPS Act committed tens of billions to domestic semiconductor manufacturing after policymakers concluded that concentrated overseas production created unacceptable exposure.⁴³ Canada has made the same calculation for food - it formally designates food and manufacturing as critical infrastructure and is now committing hundreds of millions to domestic food production capacity, explicitly framed as a national security response to the same geopolitical pressures that have exposed American agricultural supply chains.⁴⁴ Food is not a semiconductor.

The consequences of getting it wrong are not a supply chain disruption. They are empty shelves, unplanted fields, and a farm sector that cannot function because the inputs it was built around are no longer available at a price anyone can afford. Greater resilience would require diverse suppliers, validated alternatives, domestic manufacturing capacity, and precision tools that reduce how much any single input a farm needs.

The way out is to build a system that does not require a Defense Production Act order every time one link in the chain comes under strain.

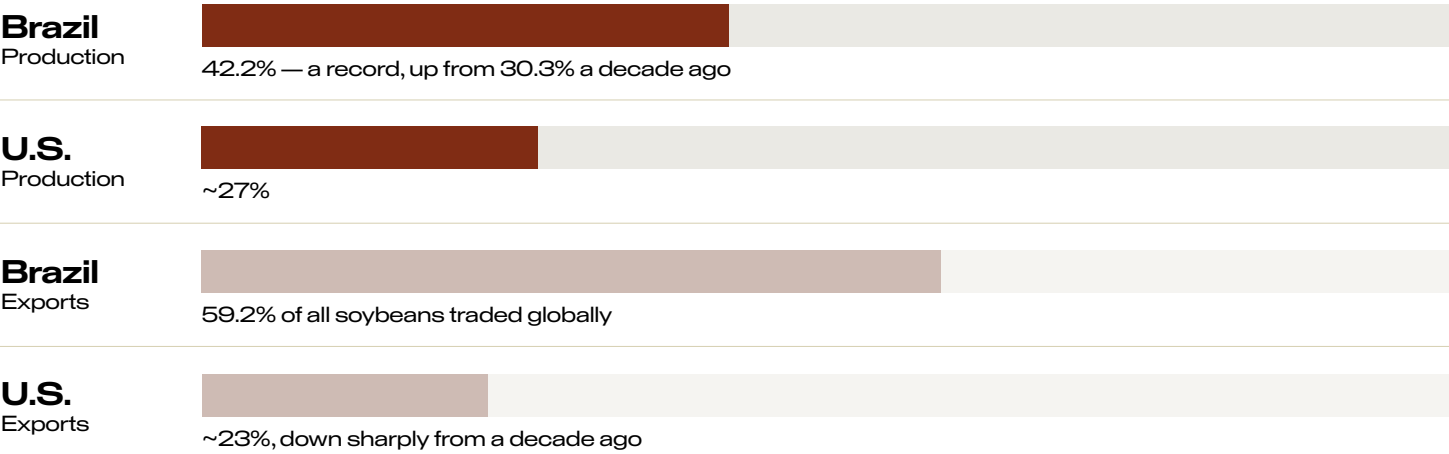
A production system that has optimized for short-term input cost while quietly accumulating strategic risk has made the same trade that energy policy made with Russian natural gas. It looked rational year by year, right up until it didn't.

Global Competition: The Ground Has Already Shifted

For most of the past century, American agriculture operated on the unstated assumption that the world needed what the U.S. grew, and the U.S. would be the one selling it. That assumption has weakened substantially, faster than much of the public conversation around farming has recognized.

Exhibit 2.0

Share of World Soybeans (2025-26)⁴⁵



Let's start with soybeans. As noted in the exhibit above, Brazil has pulled decisively ahead of the U.S. as the world's dominant soybean supplier, a shift that has played out entirely within the last decade. China, the world's largest soybean buyer by a wide margin, has shifted its purchasing accordingly. In 2025, Brazil supplied nearly 74% of China's total soybean imports, while American soybean exports to China fell sharply amid an ongoing trade dispute, with American farmers harvesting their crop with little indication of when, or whether, China would resume buying at its previous scale.⁴⁶

This happened because Brazil made a deliberate, sustained national bet on agricultural expansion - converting tens of millions of acres of pastureland into cropland, investing heavily in logistics and port infrastructure, and building a structural cost advantage that compounds year after year. Brazilian soybeans currently carry China's standard 3% import tariff, while American soybeans face a combined 13% tariff, a 3% base rate plus a 10% retaliatory tariff that China has signaled it may lift for shipments arriving after October 1, 2026.⁴⁷ Specific rates have shifted before and will likely shift again. What has proven durable is Brazil's underlying cost position, built on logistics, scale, and land use advantages that hold regardless of which tariff regime happens to be in place in a given year.

Brazil's gains are not confined to soybeans. It has also become the world's largest cotton exporter, and continues to expand cropland in its interior, with researchers estimating approximately 70 million acres of pastureland still available for conversion to crops.⁴⁸ Across the global agricultural map, countries that treated agriculture as a strategic, long-term national investment have gained ground steadily, year after year, against a U.S. that has mostly treated agricultural competitiveness as something that takes care of itself.

The core strategic reality runs deeper than any single crop. In global commodity markets, American farmers are price takers. A production system optimized for volume but exposed to volatile prices and rising input costs cannot deliver durable margins or long-term competitive advantage. Meanwhile, global competitors are not standing still. They are aligning agricultural policy with broader national priorities - energy security, industrial development, and geopolitical influence. The U.S. has yet to bring those priorities together at comparable scale.

The BRICS Dimension

Brazil's rise must be understood within a broader geopolitical context. The BRICS economies - Brazil, Russia, India, China, and South Africa - collectively represent a growing share of global population, natural resources, and agricultural trade flow. Each occupies a strategically distinct position in the global food system that affects American agricultural competitiveness.

Russia has emerged as a dominant supplier of both energy and agricultural inputs, particularly fertilizers, giving it significant leverage over global food production costs. It is also a leading wheat exporter, competing directly with the U.S. in key export markets.

Russia's position as a leading wheat exporter also coincides with a long-term retreat by American wheat growers. U.S. wheat acreage has fallen by more than 40 million acres since 1981, as farmers shifted toward corn and soybeans, which benefited far more from decades of genetic and technological improvement and from policy support structured around those two crops specifically.⁴⁹ That long-term decline collided with an acute shock in 2026, when severe drought across the Great Plains pushed the U.S. winter wheat harvest to its smallest level since 1965, with roughly a third of wheat fields going unharvested.⁵⁰ A sector that had already been shrinking for structural reasons is now also exposed to the kind of single-year weather risk that a more diversified production base would be better positioned to absorb.

India, as the world's most populous country, represents a source of rapidly growing demand for higher-value agricultural products (e.g., proteins, oils, and processed foods) driven by rising incomes and dietary shifts. How that demand is supplied, and by whom, will shape global agricultural trade patterns for decades. China, meanwhile, has made strategic agricultural investment a core component of its national security agenda, both by developing domestic production capacity and by securing long-term supply relationships with producers like Brazil that reduce its dependence on U.S. agricultural exports. Taken together, the BRICS dynamic represents a multipolar agricultural trading environment that is fundamentally different from the one in which U.S. export dominance was built. Supply chains, trade flows, and pricing power are being reoriented in ways that reduce American leverage and increase the strategic importance of differentiation, resilience, and value-added production.

The European Wildcard

Europe's Common Agricultural Policy presents a more complicated competitive picture than it might appear. The CAP has been actively redirecting support toward environmental objectives for over a decade - the current CAP 2023-2027 requires 25% of direct payments to fund eco-schemes, and compliance with environmental conditionalities is a prerequisite for receiving support at all.⁵¹ On its face, this suggests European production capacity may be constrained by regulatory burden in ways that create export market opportunities for U.S. producers.

But the picture has shifted. In July 2024, the EU adopted a simplification package that lowered some environmental protection requirements and removed controls and penalties for small farms, a direct response to widespread farmer protests across Europe - protests that far-right parties seized on heading into European Parliament elections, and that fed off broader anger tied to the war in Ukraine, including disputes over Ukrainian grain imports.⁵² A second simplification package was proposed in May 2025, and EU agriculture ministers have since emphasized food security, farmer competitiveness, and fair incomes as core priorities, signaling a partial retreat from the environmental-first posture that defined the previous reform cycle.⁵³

The strategic implication for the U.S. is twofold. First, the assumption that European production will be meaningfully constrained by environmental regulation is less reliable than it appeared two years ago. Europe is recalibrating toward competitiveness, not away from it. Second, and more importantly, Europe's policy volatility itself is instructive. A farm policy that swings between environmental mandates and farmer relief packages, without a coherent long-term framework, creates exactly the kind of uncertainty that undermines investment and planning. The U.S. should take note: a credible 10-year strategy requires durable incentive structures, not reactive policy adjustments.

The Strategic Imperative

These competitive shifts will shape the environment American agriculture faces over the next decade. Brazil's expanding production capacity, Russia's influence over input markets, India's growing food demand, and China's strategic sourcing realignment will all shape the markets in which American farmers compete. A U.S. agricultural system that remains optimized for volume commodity production, dependent on concentrated input supply chains, and lacking a coherent national competitiveness strategy is poorly positioned to navigate that environment.

The trade data tells the story plainly. For decades, agricultural exports were one of America's most reliable sources of trade surplus — a point of national economic pride and rural prosperity. That surplus is gone. After decades of consistent trade surpluses, the U.S. has run an agricultural trade deficit every year since 2022. The deficit reached \$31.8 billion in fiscal year 2024 and reached \$43.7 billion in fiscal year 2025 - the largest on record.⁵⁴ The underlying dynamic is structural rather than cyclical because U.S. exports remain concentrated in lower-value bulk commodities whose prices have declined sharply from their 2022 peaks, while imports are rising, driven by strong consumer demand for higher-value products that the domestic agricultural system is not positioned to supply competitively.

The deficit points to a growing mismatch between what American farms produce at scale and what domestic and global buyers increasingly demand. Restoring a trade surplus, or even stabilizing the deficit, will require a deliberate shift toward higher-value, differentiated production systems that maximize profit per acre and capture more of the margin currently flowing to overseas competitors and domestic importers.

There is a version of the next decade where the U.S. treats this as a temporary cyclical dip and waits for prices to recover. There is another version where it treats this as the structural shift it is and competes through differentiated, higher-value production that doesn't depend on being the cheapest bulk supplier in a market where Brazil has already shown it can out-compete on cost. The first path is a bet that the world reverts to a trade pattern that has already been disappearing for most of the past decade. The second path is harder. It is also the only one that gives American farmers a viable answer to a competitor who has already won the argument on price. 🎯

A 10-Year Roadmap

PHASE I (2026–2029)

Start Now, Prove It Works

PHASE II (2029–2033)

Build the Buyer, Not Just the Supply

PHASE III (2033–2036)

Make It the System, Not the Exception



This roadmap has two objectives.

- **First, to start reshaping the current system by changing the incentives, infrastructure, and policy frameworks that keep American agriculture on a narrow path.**
- **Second, to create the markets that are still missing, including the buyers, pricing, financing, and land-use options that would make more diversified, higher-margin farming viable. The two efforts are closely linked and will need to advance in parallel.**

It took the better part of a century to build the current system, which is optimized for yield, dependent on a narrow set of inputs, and structured so that much of the value created flows away from the farm. Changing that will take time, but much of the work can start now and a long horizon should not become a reason to delay it.

A 10-year horizon gives this effort a realistic shape, organized in three phases. But the phases are not strictly sequential - several of the most important structural reforms need to begin in Phase I even though they won't be fully institutionalized until Phase III, because building the political coalition and bureaucratic capacity for permanent change is itself a multi-year project.

Across all three phases, progress should be measured by profitability and resilience, not yield alone. A strong harvest only counts as success if the farmer is better off after costs and risk are taken into account. The same should be true for farmers who use fewer inputs more efficiently and improve their margins, even if yields are lower. Profitability should be the benchmark because it underpins everything else, from soil health and succession to a farmer's ability to stay on the land.

The way that private investment enters this market matters as much as the policies that shape it. The version worth building toward is capital invested in both the local, durable infrastructure - the elevator, the processor, the financing facility rooted in a region - as well as the innovation pipeline that gives farmers genuinely better tools, alternatives, and financial products to work with. Farming is inherently risky, and no financing structure eliminates that. What matters is whether the structure shares that risk honestly. Figuring out that right balance is essential in building this market.

PHASE I (2026–2029)

Start Now, Prove It Works

Most of this phase is about generating farm-level proof that a different way of growing, selling, and financing works before asking anyone to bet bigger on it. A few of the most consequential reforms need to start now, in parallel, because they require building political consensus and institutional capacity that doesn't happen quickly no matter when it starts.

Launch Regional Pilots That Test the Whole System With a Committed Path to Scale.

There is no shortage of pilot programs in American agriculture. What has been missing is pilots designed to test a fundamentally different system all at once - not one practice or one tool in isolation, but precision tools, new crop protection, diversified rotations, and improved soil management together, regionally, on the same acres, measured by profit per acre, yield stability, and input cost reduction. The other difference is what happens next. A pilot is only worth running if it has a specific, financed path to scale attached to it. The goal is proof that leads directly to action.

Build Insurance and Financial Tools Around What a Farmer Actually Needs.

No single insurance or financing product can cover the full range of risks farmers will face over the next decade. Crop insurance today is calibrated almost entirely around yield in a small set of commodity crops, and expanding what it protects - weather risk, revenue, and margin, depending on what a given farm and crop need - is part of the fix, but not the whole of it. Different problems call for different tools: insurance that protects against the weather risk no farmer can manage alone; margin or revenue protection for farmers diversifying into crops the current system wasn't built to cover; a resiliency-based backstop that holds an early adopter harmless in the years they're learning a new system; and financing - transition loans, deferred-payment input credit, revenue- and profit-linked repayment structures - built around the years before a new system pays for itself. Pilot programs for several of these should start now, in parallel, with an ongoing, explicit check on whether each tool protects the farmer in a bad year, or simply protects the lender's or insurer's return while the farmer absorbs the loss. Getting the actuarial and underwriting design right, and keeping it honest against decades of political pressure to bend the math, is its own serious undertaking and should start now.

POLICY TOOLKIT PATHWAYS

- Reform Risk Management to Enable Innovation
- Link Financing Products to Revenue and Profit

Open the Regulatory Pathway for Agricultural Innovation, Broadly.

The goal is a regulatory system that lets any genuinely better practice or product - new crop protection chemistries and biological alternatives, precision application and sensing technology, soil health diagnostics, novel breeding techniques, or something not yet invented - move from research to a farmer's field faster than the current approval process allows. That requires a more workable pathway across categories, paired with validation through independent networks (land-grant universities, public-private partnerships) so a farmer has substantial evidence before risking a season on something new. Warranty and performance-guarantee models that shift early-adoption risk away from the farmer are a promising piece of this, worth investment in their own right.

POLICY TOOLKIT PATHWAYS

- ➞ Accelerate Next-Generation Crop Protection Innovation
- ➞ Build a Diversified Innovation Pipeline with Long-Term Policy Commitment

Strengthen the Supply Chains Behind the Inputs Farmers Depend On.

Reducing dependence on a handful of globally concentrated suppliers for fertilizer and crop protection is worth pursuing immediately, through domestic production capacity, proven alternatives that work as reliably as the conventional chemistries and fertilizers they would replace, and precision nutrient management that simply lowers how much input a farm needs in the first place. Any substitute still has to meet the farmer's performance requirements in the field. It's also worth being honest that some of this risk is self-created - decades of building a system that is reliant on a narrow set of purchased inputs is itself the vulnerability. A resilient supply chain may also mean more regional production with less long-distance dependency, alongside a broader supplier base.

POLICY TOOLKIT PATHWAY

- ➞ Rebuild Domestic Input Manufacturing Capacity

Make a Real Beginning Farmer Strategy, Not the Same Underfunded Programs.

Existing federal beginning farmer programs are not working at the scale this moment requires, and continuing to describe modest expansions of them as the solution understates the problem. Land ownership is aging and consolidating. Private capital, including private equity and institutional investors now active in farmland, can absorb land faster than any beginning farmer program can help a new entrant compete for it. A larger response could include shared equity and cooperative ownership models that give new entrants an ownership stake without requiring them to outbid an institutional buyer, a major expansion of access to capital, and a closer look at the economics of entering a profession where the cost and difficulty of the work often outpace the financial reward. A loan program alone cannot address all of those barriers.

POLICY TOOLKIT PATHWAYS

- ➞ Expand Pathways for New Farmers
- ➞ Support Farm Succession and Land Transfer
- ➞ Paired Incentives for Landowners and Beginning Farmers

PHASE II (2029–2033)

Build the Buyer, Not Just the Supply

Once Phase I has produced credible evidence, Phase II is about making a different way of farming the normal path rather than the exception, starting with a reliable place to sell what gets grown.

Build the Local Institutions That Connect Farmers to Committed Buyers.

The most direct way to close the gap between farmers willing to diversify and the food companies and processors who say they want that is to invest in the local infrastructure that sits between them - the elevator, the regional processor, the first handler who can manage identity-preserved crops at the point where they're collected and graded. That is where practice verification, simple data tools, and pricing transparency would do the most good, because it's the place in the system every farmer and every buyer already has to pass through. Procurement systems that financially reward diversified, lower-input, well-documented production, backed by firm purchase commitments, should scale here, with the credibility built on the pilot data from Phase I.

POLICY TOOLKIT PATHWAYS

- Center Procurement and Identity Preservation on Local Elevators
- Build Market and Infrastructure for Nutrient-Dense Crops

Scale Farm Systems Integrators That Can Deliver Both a Better Price and Better Advice.

The cooperative and retailer networks closest to farmers are positioned to fix two problems at once - weak price leverage and limited access to new tools and advice - if they shift from selling input volume to operating as Farm Systems Integrators, paid for documented improvements in farmer profitability rather than product moved. Whether that takes the form of existing cooperatives evolving, or something closer to the elevator model extended further into advisory and financial services, the same local roots and community accountability that make rural elevators durable should be the model, not a centralized platform with no stake in any particular place.

POLICY TOOLKIT PATHWAYS

- Transition Farm Systems Integrators from Input Retailers to Outcome Partners
- Deliver Accessible Advisory Tools to Farmers
- Strengthen Antitrust and Procurement Transparency

Build the Financing Ecosystem at Scale, With the Same Local Test Applied.

The transition finance facilities, profit-linked products, and underwriting models from Phase I should grow into a real market here, with longer-term institutional capital - pension funds, insurance companies - stepping in as proof accumulates. Transferable credits rewarding soil health, input resilience, and crop diversification should be established in this phase too, and the idea is worth extending further: the same credit mechanism, paired with community-level incentives, could help guarantee elevators and other local first handlers a stable enough revenue base that they can commit to buying a new or different crop before the volume fully exists, with a meaningful share of that benefit flowing back to the farmer rather than stopping at the institution that captured the credit.

POLICY TOOLKIT PATHWAYS

- Create Transferable Stewardship Credits
- Create Transferable Credits for Health and Environmental Outcomes
- Provide Transition Capital and the Financial Products to Support It

Move Policy Reform Through Every Available Channel.

A comprehensive Farm Bill may not arrive on a useful timeline, and even if it does, the Farm Bill, as currently structured, may not be the right vehicle for the scale of change needed. Agricultural policy today touches energy, public health, climate, national security, nutrition, rural economic development and more. A bill designed primarily around commodity support wasn't built to hold all of that, and trying to force it into the existing framework may be the wrong strategy entirely. We believe reform should move across all of these issue areas - through annual appropriations, USDA rulemaking, targeted standalone legislation, and state policy - necessarily cutting across multiple committees of jurisdiction and whatever vehicle is moving, and including an honest look at whether current commodity support dollars could be better deployed toward the outcomes this strategy requires.

POLICY TOOLKIT PATHWAYS

- Align Agricultural Policy Incentives with Innovation and Soil Health
- Build Market and Infrastructure for Nutrient-Dense Crops

PHASE III (2033–2036)

Make It the System, Not the Exception

The final phase locks in what was built and fought for in the first eight years, so it survives a change in administration, a bad market cycle, or simple inattention.

Finish What Started in Phase I: Profitability as the Default Measure of Federal Programs.

By this point, crop insurance, conservation programs, commodity support, and rural development should be operating on risk-adjusted profitability and resilience as core measures, not yield, because the political and regulatory work to get there began years earlier rather than waiting until now.

POLICY TOOLKIT PATHWAYS

- Align Agricultural Policy Incentives with Innovation and Soil Health
- Build Market and Infrastructure for Nutrient-Dense Crops

Embed Resistance Stewardship and Input Diversity Standards.

Growing resistance to a narrow set of chemistries poses a compounding risk to agricultural productivity. Once the innovation pipeline established in Phases I and II reaches commercial scale, this phase should introduce national stewardship frameworks that promote more diverse pest management strategies through minimum diversity standards and incentives for integrated pest management adoption.

POLICY TOOLKIT PATHWAYS

- Accelerate Next-Generation Crop Protection Innovation
- Build a Diversified Innovation Pipeline with Long-Term Policy Commitment

Make the Domestic Supply Chain Resilient for Good.

The manufacturing capacity, validated alternatives, and precision infrastructure built over the previous eight years should be locked in through sustained investment, so the country is no longer one geopolitical disruption away from an emergency order to secure a basic input.

POLICY TOOLKIT PATHWAY

- Rebuild Domestic Input Manufacturing Capacity

Build a System That Works at Home First.

The ultimate goal of this strategy is not to win a global market-share contest with Brazil or anyone else. It is to build an agricultural system that is profitable, resilient, and capable of feeding the country well using what it grows, processes, and sells closer to home, with exports as a genuine bonus once that foundation is solid, not as the thing the whole system has been organized around from the start. A domestic-first agricultural economy that happens to also export well is a stronger, more durable goal than an export-oriented one that hopes domestic resilience follows as a side effect.

What Success Looks Like by 2036

By 2036, the goal is a fundamentally different relationship between American farmers and the markets they sell into. A farmer who wants to grow something in a regenerative or organic way, or something other than a handful of subsidized commodities, should have a committed buyer, a fair price, and the financing to make the transition without betting the farm on it. A consumer should be able to find more of what they want - healthier, more diverse food - grown sustainably. And the system connecting the two should be resilient enough to absorb a bad year without requiring emergency government support to keep it from collapsing.

That is the vision. The metrics on how we know whether we're getting there, measured on a rolling, multi-year basis to account for normal weather and market swings:

These targets are not equally certain. The reduction in field passes per acre rests on technology that already works and simply needs to spread. The reduction in single-mode-of-action reliance is ambitious and needs an influx of innovation, since it depends on alternatives supporting yields and reaching commercial scale, not just pilot scale, well before the decade is out. Ultimately, the test is whether farmers keep more of what they earn, consumers have greater access to the food they want, and American agriculture becomes less financially and operationally fragile. 🎯

+20%

Risk-adjusted profit per acre

-10%

Yield volatility

-40%

Reliance on any single mode of action for weed and pest control

-15%-20%

Field passes per acre, lowering fuel, labor, and machinery costs

>40%

Of acreage operating under verified, systems-efficient production

+25%

Domestic production of nutrient-dense foods

The Policy Toolkit



The gaps described so far call for different tools in different places. Some will depend on public policy, some on private investment, and many will require both. The mix should evolve as evidence accumulates. What follows is a working set of those mechanisms, organized by which gap each one is meant to close.

This is not a complete list - there are many more ideas out there. Some of these are already working in pockets of American agriculture and simply need room to scale. Others are closer to a starting hypothesis that deserves a pilot before anyone bets too much on it. Few, if any, belong everywhere at once. The point is not to prescribe a single fix overnight, but to put enough viable options on the table that the right one, in the right place, has a chance to be chosen - and to make clear that the work now is to put a plan together and start acting on it, not simply to keep describing the problem.

Closing the No Buyer Gap

Reform Risk Management to Enable Innovation.

Federal crop insurance programs remain one of the most powerful levers shaping farm decision-making, and they are currently calibrated almost entirely around a small set of commodity crops. Expanding margin-based risk management tools for diversified cropping systems - specialty crops, regenerative rotations, emerging high-value crops - would give farmers the financial confidence to experiment with new production models without bearing the full downside risk of transition. This is a policy change with direct investment implications. As risk management coverage expands for new crop categories, the investable market for seed, inputs, and processing infrastructure in those categories expands with it.

Build Market and Infrastructure for Nutrient-Dense Crops.

Consumer demand for healthier foods is clear and growing, but demand alone does not create a functioning market. Food companies can't source enough nutrient-dense ingredients domestically, farmers have no guaranteed buyer to justify growing them, and the gap gets filled by imports.

Breaking that coordination failure requires deliberate market-making that neither side can accomplish alone. Farmers who diversify into fruits, vegetables, pulses, and other nutrient-dense crops need reliable buyers, competitive prices, and accessible processing and distribution infrastructure before they will take on the risk of transition. Food companies and retailers need supply certainty and price stability before they will commit to domestic sourcing at scale. Public-private partnerships - structured around multi-year offtake agreements between food manufacturers and farmer cooperatives, supported by USDA rural development investment in regional processing and distribution infrastructure - should be the primary vehicle for building these supply chains simultaneously from both ends. For food companies and retailers, investing in domestic supply chain development for nutrient-dense crops is a sourcing strategy that reduces import dependency, strengthens supply chain resilience, and secures reliable access to ingredients that are increasingly central to their product portfolios.

Long-term sourcing commitments and broader risk coverage would also give investors more visibility into demand and revenue, making processing, cold storage, and regional distribution easier to finance. The infrastructure gap itself - processing, cold storage, regional distribution — represents a concrete and currently undercapitalized opportunity to potentially generate returns at the exact point where agricultural production, supply chain resilience, and consumer health trends converge.

Align Agricultural Policy Incentives with Innovation and Soil Health.

The Farm Bill has historically been the single most influential policy tool shaping what American farmers grow, but its prolonged dysfunction is itself a symptom of a structural problem. The 2018 Farm Bill has now been extended multiple times without reauthorization, reflecting a broader political failure to build consensus around the future direction of American agricultural policy.

That reality demands a more diversified policy approach. Rather than concentrating reform hopes in a single piece of legislation that has proven increasingly difficult to move, policymakers should pursue agricultural incentive reform through multiple channels simultaneously, including the annual appropriations process, executive agency rulemaking at USDA, targeted standalone legislation, and state-level policy innovation that does not require federal reauthorization to implement. The substance of the reform agenda remains clear regardless of the vehicle: incentives that reward crop innovation, soil health improvements, and integrated livestock systems - rather than optimizing exclusively for commodity volume - are essential to shifting the structural incentive landscape at scale.

These incentives need not immediately or wholesale replace existing commodity support. Federal commodity support programs were designed for a production system optimized around a small number of bulk crops. As American agriculture evolves toward more diversified, higher-margin production systems, it is both appropriate and necessary to ask whether support dollars currently flowing to commodity programs that reinforce the cost treadmill could be more effectively deployed toward incentives that reward diversification, soil health, and resilience. A 10-year strategy that takes seriously the goal of improving risk-adjusted profit per acre should include an examination of whether the current allocation of agricultural support - not just its total level - is optimized for the future rather than the past. Reallocating a portion of commodity support toward diversification incentives would align public spending more closely with the conditions farmers need to improve profitability, manage risk, and adopt new practices. A strategy focused on risk-adjusted profit per acre, rather than yield volume alone, requires that shift.

Center Procurement and Identity Preservation on Local Elevators.

Invest in the local infrastructure that already sits at the chokepoint between every farmer and every buyer - the elevator, the regional processor, the first handler - as the place where practice verification, simple data tools, and pricing transparency can take hold. Procurement systems that financially reward diversified, lower-input, well-documented production should be built around this existing infrastructure rather than around a new, separate system layered on top of it.

Create Transferable Stewardship Credits.

Transferable agricultural tax credits that reward documented improvements in soil health, input resilience, and crop diversification, monetizable through sales to food companies, agricultural supply chain partners, and corporate sustainability buyers, create a private market signal that rewards long-term stewardship and reduces dependence on public programs to carry the full incentive load. The same mechanism could be extended to elevators and other local first handlers, paired with community-level incentives, to help guarantee a stable enough revenue base that they can commit to buying a new or different crop before the volume fully exists, with a meaningful share of that benefit required to flow back to the farmer.

Create Transferable Credits for Health and Environmental Outcomes.

Farmers should be financially recognized for the broader societal value their production systems generate - improved soil health, reduced chemical inputs, increased nutritional density of the food supply. Transferable agricultural tax credits that reward these outcomes, and that can be sold to food companies, healthcare systems, and corporate sustainability buyers seeking to strengthen their supply chains, would create a private market signal that directs capital toward the farm-level transitions that public programs alone cannot fund. For investors, such structures could also create new financial exposure to verified agricultural and health outcomes.

Closing the No Price Signal Gap

Transition Farm Systems Integrators from Input Retailers to Outcome Partners.

Closing the price signal gap requires the cooperative and retailer layer to shift from selling input volume to operating as Farm Systems Integrators. In practice, this means offering farmers guaranteed margin-per-acre contracts, integrating biological and precision agriculture recommendations alongside traditional inputs, and sharing in both the risk and the upside of improved farm profitability. Federal incentives should reward co-ops for documented improvements in member farm profitability rather than input sales volume. Elements of this model already exist in parts of the specialty crop sector, demonstrating that the transition is commercially viable - the strategic opportunity is to scale what works into the broader commodity system.

Strengthen Antitrust and Procurement Transparency.

Renewed antitrust scrutiny of agricultural input and processing markets is necessary. But decades of consolidation happened largely without serious antitrust enforcement, and there is a substantive, ongoing debate among antitrust experts and officials about whether current enforcement tools are well-suited to the kind of harm concentrated buyers can inflict on farmers specifically, as opposed to harm to consumers. Closing that gap will likely take both a renewed enforcement effort and a hard look at whether the existing legal tools are the right ones for this particular problem. Alongside that work, transparency requirements for procurement pricing in concentrated commodity sectors, and structural incentives that strengthen farmer-owned cooperative alternatives to both concentrated input suppliers and concentrated commodity processors, can make progress regardless of how that larger legal debate is resolved.

Closing the No Financing Gap

Link Financing Products to Revenue and Profit.

The financial risk of transitioning to a new production system is highest precisely when the farm operation is most exposed - before the new system has generated the revenue history that justifies the investment, and before the efficiency gains of the new system have translated into improved margins. Fixed-payment financing structures are poorly suited to that moment on both counts. Transition loans, deferred-payment input financing, and crop-specific insurance instruments that link repayment obligations to revenue performance rather than fixed schedules reduce the immediate cash flow risk of system change. But the more powerful innovation is financing that links obligations to farm-level profitability rather than revenue alone. A farmer generating strong gross revenue while absorbing high transition costs is not yet in a position to service fixed debt. A financing structure that recognizes that distinction, deferring or scaling obligations until profitability thresholds are met rather than revenue targets, more accurately reflects the risk profile of agricultural system transition and better protects the farmer through the most vulnerable period of change.

None of this answers the harder, more granular questions a farmer has to work through to make a transition work, including which fields go into the new crop this year, when a cover crop earns its place in the rotation, and where a waterway needs to go. Financing removes a significant obstacle - it does not replace the agronomic judgment, the local advice, or the place to sell what gets grown, all of which still have to exist for the financing to be worth using in the first place. A transition loan is necessary. It is not, by itself, sufficient.

Provide Transition Capital and the Financial Products to Support It.

Shifting to diversified higher-margin production systems is a capital event. New crops require different equipment, irrigation systems, storage facilities, and in many cases, entire new processing infrastructure at the farm level. For farmers already on compressed margins and short-term leases, the upfront cost of transition is often the decisive barrier - not the lack of interest, not agronomic uncertainty, but access to patient capital at reasonable terms.

But capital alone is insufficient if the products and financial instruments farmers need do not yet exist. The private sector has a critical role to play not just as a source of financing but as a developer of the next generation of transition-enabling products - purpose-built equipment for emerging crops systems, precision irrigation tools calibrated for specialty and diversified rotations, on-farm storage solutions designed for perishable and high-value crops, and financial products such as transition loans, revenue guarantees, and crop-specific insurance instruments that currently have no commercial equivalent. Agricultural technology companies, equipment manufacturers, specialty lenders, and financial innovators should not wait for perfect policy conditions to be developing these tools.

Dedicated transition financing facilities - combining USDA loan guarantees, private agricultural lenders, and patient capital from investors aligned with long-term farm resilience - should be structured around the new market opportunities that support farmers making that move. For investors, the new market presents significant opportunities. Farmers making documented investments in diversified, higher-margin systems are improving the long-term creditworthiness of their operations, and the financial institutions and companies that develop products to support that transition may stand to capture a significant share of an agricultural lending market that is structurally changing. The returns follow the investment in infrastructure, the innovation, and the policy frameworks that make the transition viable.

Expand Pathways for New Farmers.

USDA beginning farmer loan programs, land transition assistance, and mentorship initiatives provide a foundation, but their scale is inadequate relative to the size of the transition underway. Closing the gap will require private capital innovation alongside public program expansion. Shared equity models, cooperative ownership structures, and farmland access funds can reduce the upfront capital required for new farmers to establish operations, creating investable structures that align financial returns with

productive agricultural use. Federal tax incentives for landowners who offer five- to 10-year leases would provide the tenure stability that beginning farmers need to justify transitioning to higher-profit, lower-input production systems. Longer tenure can also support better land management and give owners and investors greater visibility into how the asset is being maintained.

Paired Incentives for Landowners and Beginning Farmers.

Paired incentive structures offer one of the most direct levers available. A landowner who rents to a beginning farmer could receive a property tax abatement or federal income tax credit for the duration of the lease - say, five to 10 years - while the beginning farmer receives a USDA-backed loan at zero or near-zero interest for the same period. Neither incentive alone is sufficient - the landowner needs a reason to choose a beginning farmer over a more established operator or institutional buyer, and the beginning farmer needs financing terms that reflect the reality that a new operation won't generate strong returns in year one. Together, they create the conditions for a transaction that the market currently has no mechanism to produce on its own. Absentee landowners hold significant leverage over who farms the land they own - this is a way to point that leverage in a productive direction without requiring them to sacrifice returns.

Support Farm Succession and Land Transfer.

The succession challenge is as much a planning failure as a financial one. Many farm families have not engaged in the legal, financial, and tax planning necessary to navigate ownership transitions effectively, leaving land vulnerable to fragmentation, forced sale, or conversion at precisely the moment when thoughtful transfer could keep it in productive agriculture. Public and private programs that deliver accessible succession planning support, including legal assistance, tax strategy, and facilitated family transition planning, can materially improve outcomes for retiring farmers and the land they steward.

Closing the Innovation Gap

Build a Diversified Innovation Pipeline with Long-Term Policy Commitment.

Farmers will not transition away from proven tools without confidence that alternatives are available, proven, and supported by durable policy. A diversified innovation pipeline — integrating genetics, biologicals, precision agriculture, and diversified crop rotations — can maintain or improve productivity while reducing systemic input risk. But that pipeline requires the kind of long-term, stable policy and regulatory commitment that allows companies to invest in discovery, farmers to invest in adoption, and investors to commit capital with reasonable return expectations. Episodic policy support produces episodic innovation. A 10-year strategy requires a 10-year commitment.

Farm-Level Data and the New Measurement Layer.

Agricultural data has always existed in fragments. Farmers carry deep observational knowledge of their land - which fields flood and which drain, where yields tend to drop off, which areas respond well to rain and which don't. USDA has collected aggregate statistics for decades. Input companies and equipment manufacturers have captured operational data in their own proprietary systems. But the things that matter most for a more resilient, diversified agricultural system - soil carbon levels, precise input efficiency, field-level yield variability, the actual outcomes of specific management practices - have been either unmeasurable, prohibitively expensive to measure, or have been trapped in siloed data forms that no one downstream could access, integrate, or act on. The farmer knew their land, but not always at the resolution that would let them prove what they were building or get paid for it. The lender, the insurer, and the ecosystem services buyer had even less to work with.

Artificial intelligence is what changes this. The convergence of AI-enabled analysis with precision agriculture sensors, satellite imagery, and connected farm equipment is generating field-level insight at a scale and resolution that simply has never existed. AI is what makes it possible to turn raw data into something actionable - identifying patterns across thousands of fields, predicting outcomes under different management scenarios, and verifying what's actually happening on a specific acre continuously and cheaply. For the first time, it is becoming possible to know - verifiably and at scale - what soil health looks like at the field level, how inputs are performing, and what specific management practices are producing in real time. When that capability can be aggregated across thousands of farms, it doesn't just improve existing tools. It changes what is measurable, and therefore what is insurable, creditable, and financeable in ways the current system was never built to accommodate.

Traditional agricultural credit models systematically undervalue farm operations because they lack the data infrastructure to assess agronomic risk accurately. A farmer investing in soil health, precision application, and diversified rotations is building long-term operational resilience, but conventional underwriting has no mechanism to recognize or price that. Fintech platforms that integrate yield history, soil health metrics, input efficiency data, precision agriculture outputs, farm-level margins, and revenue protection coverage can generate creditworthiness assessments that far more accurately reflect farm-level resilience - unlocking capital for operations that conventional models would decline or misprice.

The same field-level data also changes the economics of ecosystem service markets, which have historically struggled because the cost of verifying what's happening in a field - soil carbon sequestration, water quality improvement, biodiversity outcomes - was too high relative to the value of the credits being generated. Continuous, AI-enabled field monitoring makes that verification cheap enough to be worth doing, which means transferable stewardship credits are becoming newly feasible not just as a policy idea but as a practical, scalable market mechanism. A farmer who can document, continuously and at field level, what their management practices are producing is positioned to participate in markets for verified outcomes that have until now been too costly to access or too difficult to verify at meaningful scale.

There is a second, perhaps more valuable use for the same data and modeling tools, separate from what it does for lenders. A farmer gets one real attempt at a given season, and at most a few dozen attempts of them across an entire career, with weather and market conditions different every time - there is no equivalent of running the same experiment a hundred times to see what works. A single bad outcome in a single year can end an operation, with no next attempt to learn from it. The same data infrastructure built to support underwriting can also be turned toward helping a farmer rehearse a decision before making it - running a new rotation, a new input strategy, or a new practice against a range of weather and market scenarios in advance, so the one attempt a farmer gets in a given year is better informed than it would otherwise be. Underwriting helps a lender price risk. Scenario modeling helps a farmer compress the time it takes to learn whether something works, without having to risk an entire season finding out the hard way - or ever taking the risk at all.

The financing tools needed to support this transition - transition loans, revenue-linked products, stewardship credits - become more viable and more accurate as this data layer matures. The measurement infrastructure and the financial products are building toward each other. The institutions that build the analytical tools to support either one will define the next generation of agricultural lending and farm management, and capture a significant share of a market that current models are leaving underserved.

Accelerate Next-Generation Crop Protection Innovation.

A national effort, combining sustained public-private investment, land-grant university collaboration, and a dedicated regulatory pathway, should target the delivery of scalable alternatives and complements to traditional chemistries by 2030. The regulatory pathway is critical: novel technologies should not be required to navigate approval processes designed for conventional synthetic chemicals. A purpose-built track that rewards demonstrated field performance and resistance management outcomes would materially accelerate commercialization. None of this should wait on what's already available. Federal conservation program standards should be updated now to support integrated pest management, and capital and financing tools should be made available to farmers deploying precision agriculture technologies that reduce reliance on any single mode of action and improve the targeting of crop protection applications already in use. Reducing application volume while maintaining efficacy is less an environmental concession than a cost reduction strategy that directly improves profit per acre. For private investors, S2G believes the pipeline of biological crop protection represents a strong, long-term opportunity in agricultural technology, as the regulatory and market conditions that constrained adoption a decade ago are now moving in the opposite direction. Greater regulatory clarity would make that pipeline easier to evaluate and finance at commercial scale.

A faster pathway still needs a high performance bar. A product that performs as claimed deserves a faster path to a farmer's field. A product that doesn't shouldn't get one simply because it carries a newer label. The "demonstrated field performance" standard at the center of this regulatory track is what is supposed to do that work — it only means something if it is enforced consistently, on every product seeking the faster pathway, regardless of who is selling it.

Expand Rural Digital Infrastructure to Enable Farm Data.

Real-time AI-driven farm management depends on connectivity that much of rural America still lacks, and without it, the data that farms generate cannot be captured, transmitted, or analyzed at the speed and scale that modern decision tools require. Public investment in rural broadband is a necessary foundation, but private capital has a direct role here too. Telecommunications companies, agricultural technology firms, and infrastructure investors have both the incentive and the capability to accelerate rural connectivity in exchange for the long-term data and platform relationships that connectivity enables. Public-private infrastructure partnerships - modeled on approaches used in rural electrification and broadband expansion - should be a primary vehicle for closing the connectivity gap rather than relying on public funding alone.

But connectivity by itself is not a neutral good. The same digital infrastructure that brings a small family farm online also makes it easier for a large, well-capitalized operation - or an absentee owner managing several farms from a distance - to manage more acres with fewer people on the ground. Closing the connectivity gap without also closing the access and advisory gaps described below risks accelerating consolidation rather than reversing it. Investment in rural broadband should be paired explicitly with the access and advisory reforms that determine who benefits once the connection exists.

Give Farmers Ownership and Interoperability Over Their Data.

A farm that generates rich operational data but cannot access, analyze, or move it freely is still functionally data-poor. Today, proprietary data lock-in by large ag technology platforms concentrates analytical advantage among vendors rather than producers - creating information asymmetry that works against the farmer at precisely the moment when data should be their most valuable management asset. Industry-led interoperability standards, analogous to open banking frameworks in financial services, would allow farmers to move their data freely between platforms and advisors, driving competition on outcomes rather than lock-in.

But interoperability solves a narrower problem than it might first appear to. It addresses the lock-in problem - a farmer's ability to leave one vendor for another - without necessarily addressing value capture, which is the deeper issue. A platform that turns a farmer's raw, messy data into a genuinely useful insight is also positioned to own that insight and sell it back, whether or not the farmer can shop for a competitor doing the same thing. And for a true commodity producer, where one bushel of corn brings the same price as any other regardless of how it was grown, better data alone does not change what the farmer is paid. Data ownership and interoperability do more for a farmer's actual economics when paired with a viable way to sell into a market that pays for the difference - identity-preserved, practice-based, or ecoservice-based markets among them. Without that pairing, better data risks becoming another input recommendation engine rather than a genuine source of new value for the farmer.

Deliver Accessible Advisory Tools to Farmers.

Becoming data-rich means little if the farmer cannot act on what the data reveals. Adoption will depend as much on accessibility and trust as on the underlying technology. The farmers who most need decision support tools are often the least equipped to evaluate, procure, and integrate them, and the risk of investing in unfamiliar technology on thin margins is a genuine barrier. Private sector players, including ag retailers, cooperative networks, crop consultants, and Farm Systems Integrators, are better positioned than government programs to deliver last-mile advisory services that translate AI insights into practical management decisions.

The content of that advice is equally important. Tools can go beyond optimizing existing input purchases to help with soil health, ecoservices, and diversification - the kinds of decisions that open access to better markets and prices, not just to a more efficient way of buying the same inputs. Business models that align advisor compensation with documented farm profitability improvements, rather than input sales volume, are the clearest way to tell which kind of advice a given platform or partner is built to deliver.

Rebuild Domestic Input Manufacturing Capacity.

Federal policy should prioritize incentives for domestic production of critical agricultural inputs, both existing chemistries and next-generation alternatives, to reduce geopolitical exposure. This is an area where industrial policy and agricultural policy must work together. The CHIPS Act model - targeted investment incentives for strategic domestic manufacturing - provides a relevant template for agricultural inputs. Private capital, particularly in the chemical manufacturing and agricultural supply chain sectors, should be engaged as a co-investor in domestic capacity rather than treated as a downstream beneficiary of public investment alone.

Integrate Agrivoltaic Systems to Diversify Farm Revenue.

Co-locating solar infrastructure with agricultural production, known as agrivoltaics, is an emerging opportunity to improve revenue per acre without removing land from production. Where thoughtfully designed, solar installations can coexist with crop production or livestock grazing, giving landowners a second income stream while maintaining agricultural activity. This is an area where private capital is already moving - energy developers, infrastructure funds, and agricultural investors are increasingly evaluating dual-use land arrangements as both an energy strategy and a farmland value enhancement strategy. These types of opportunities can provide meaningful differentiated revenue streams for farmers.

What makes this genuinely interesting, rather than another way to lease out land, is designing production and power generation together, with panels spaced and elevated so equipment can move through them and rotations and grazing planned around the array. There are unresolved questions in getting there including what equipment works without damaging panels, which crops and livestock tolerate the shade and spacing involved, how a system gets engineered for an existing rotation rather than the rotation being bent to fit the system. Those are solvable problems, and the fact that they're being worked through in practice, not just in theory, is part of what makes this worth real investment.

It is also worth being honest about the version of this that isn't agrivoltaics at all: a solar array installed on flat, productive cropland with no concrete plan for continued farming underneath or around it, where "dual-use" is the label rather than the reality. Federal policy frameworks should establish clear standards that distinguish the two - standards that require continued, working agricultural production, not just permit it - and provide incentives that reward land productivity rather than single-use conversion. That distinction is what determines whether public support and private capital flow toward systems that genuinely keep land in production, or toward conventional solar that simply borrowed a better name.

Develop Next-Generation Feedstocks for Marginal Land.

Federal incentives should accelerate the development of biofuels derived from crop residues, agricultural waste, perennial energy crops, and algae, reducing pressure on prime cropland while opening new income streams on marginal acres poorly suited to commodity production. A dedicated regulatory pathway - combining sustained public-private investment in discovery and field validation, expanded collaboration with land-grant universities, and an expedited review process - could move these technologies from laboratory to commercial deployment faster than the lengthy approval processes designed for conventional chemical inputs, rewarding demonstrated environmental performance and lifecycle efficiency rather than asking a new feedstock to clear the same bar built for an old chemistry.

Perennial grasses, short-rotation woody crops, and other biomass feedstocks grown on marginal or environmentally sensitive land can improve soil health and reduce erosion while contributing to the bioenergy economy. Targeted pilot programs and expanded risk management tools, including margin-based insurance for alternative feedstock crops, would give farmers the confidence to evaluate and adopt these systems without bearing the full transition risk alone. Private offtake agreements and long-term supply contracts from bioenergy companies and corporate sustainability buyers can provide the market certainty that makes these transitions financeable. Patient capital can support field trials and early commercial deployment, alongside planning and modeling tools that identify which acres, regions, and feedstocks make sense before land and capital are committed. ②

Now Comes the Work

American agriculture has proven that it can produce. The harder task now is improving the economics and market structure around that productivity, while there is still time to shape what comes next.

The system that has delivered decades of extraordinary productivity now faces a convergence of pressures that will shape its trajectory for the next generation. Global competitors are expanding capacity with deliberate national strategies while the U.S. operates largely without one. Input supply chains have become so geopolitically concentrated that securing a basic chemical input has required invoking national security authorities. A historic generational transfer of farmland is already underway, with most of it moving quietly between an aging, increasingly non-farming class of landlords and the tenants who farm it year to year. Public expectations around food and health have shifted in ways the current policy architecture has no mechanism to answer. For the first time in decades the U.S. is a net agricultural importer - a reversal previously unthinkable.

The institutions and incentives that produced today's agricultural economy were designed around a different set of priorities. They remain highly effective at driving production, but they are less equipped to respond to the pressures now surrounding it.

Agriculture sits at the intersection of food security, rural economic life, public health, and a farm family's ability to stay on the land at all. Agriculture policy is conservation policy, energy policy, climate policy, healthcare and nutrition policy, rural development, trade, food security, national security, and more. Those connections make a more coordinated approach increasingly important.

There is no committed buyer for crops outside the handful of commodities the system was built around. There is no real price signal because concentration on both sides of the farm gate has removed the farmer's ability to negotiate. The financing products that a farmer needs to transition to organic or regenerative or new crops don't yet exist at the scale needed. And, the input system is fragile and needs innovation. These are some of the specific gaps. Closing them will require both building what doesn't exist and scaling what's already working - the good news is some of it is already being built. Large food companies are committing to regenerative acres with offtake agreements. Startups are developing the tools and financial products farmers need. Cooperatives and regional processors are creating new market pathways. The challenge is that what is happening is fragmented and not always visible to the larger system. We need a process to pull together what is working, decide what should be scaled and what still needs to be developed, and determine what the policy, capital, and institutional conditions are that will make it happen.

And, importantly, we need to define the process to get us there. The scale of what needs to change in American agriculture policy requires more than incremental reform through the usual channels - we need a structured, bipartisan effort - perhaps even a commission - with representation across the full system - farmers, food companies, investors, rural communities, energy experts, nutrition and public health, and policymakers. A structure with a real mandate to examine how to expand what's working, ask the hard questions about whether current programs and spending are optimized for the future rather than the past, and produce a concrete plan that can be acted on. The country has done this before with problems it decided were serious enough. This one is.

The choice now is whether to respond while there is still room to shape the outcome. The pressures described in this report are already here, but what they mean for American agriculture over the next decade is not yet settled.

The market is missing. The ideas to build it exist. What is left is the work of building it. 🛠️

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S2G Investments is a multi-asset investment firm focused on scaling durable, market-defining businesses across food & agriculture, energy, and oceans. We provide capital and value-added resources to companies commercializing solutions designed to improve efficiency, resilience, and long-term value across industries powering the global economy. Through fit-for-purpose financing and a systems-focused investment approach, S2G is committed to driving measurable, sustained outcomes with tailored solutions that span late-stage venture, growth equity, structured finance, and infrastructure.

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