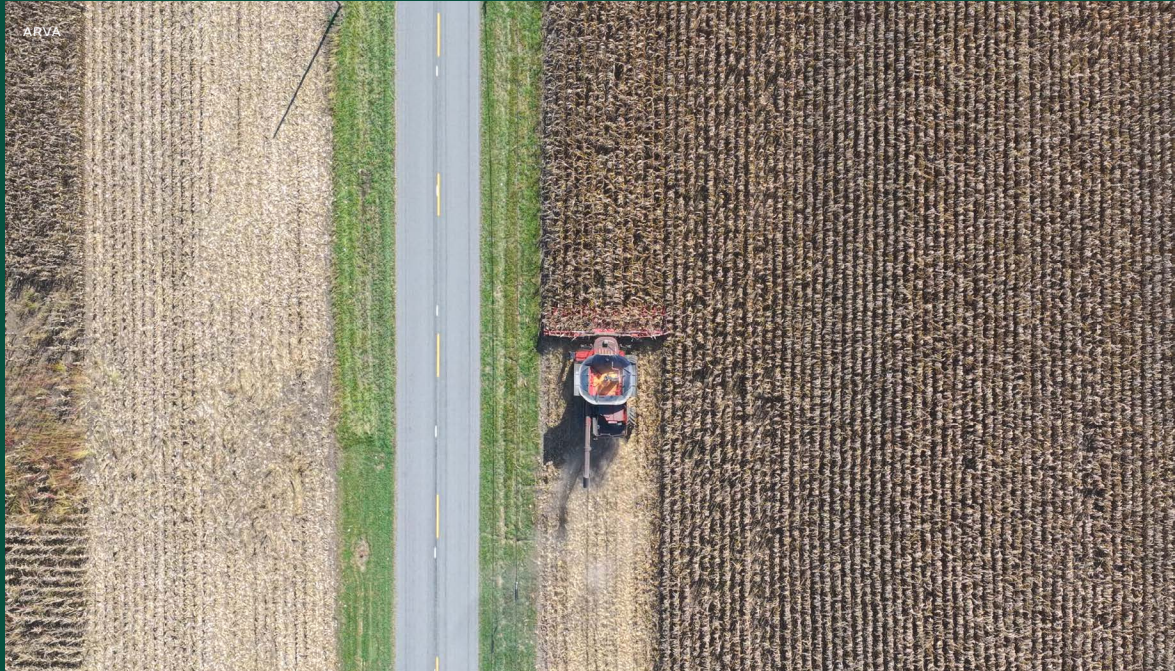




FIXING AMERICA'S AGROECONOMY

While Congress stalls on the Farm Bill, can agriculture restructure itself without waiting for Washington?

BY: LENA HUNTER

DIRECTOR OF SPECIAL FEATURE REPORTS: GEORGE CLARKE

AMERICAN FARMERS ARE FACING A TOUGH PERIOD. RISING INPUT COSTS, debt, climate change and market losses are straining producers—even the stunning rise of corn prices cannot alleviate the pressure. U.S. President Trump's war with Iran, for example, has caused diesel prices to skyrocket, hitting agriculture producers hard just as combines start to roll. A report by the U.S. Congress Joint Economic Committee found that American farmers spent \$1.4 billion more on diesel fuel during this year's spring planting season—a 63 percent increase from 2025—with the average farmer spending up to \$1,500 more on refilling.

Other inputs have also become more expensive. Phosphate prices in the Corn Belt have risen by 20 percent this year, as a price war unfolds between the big five global fertilizer chemical suppliers: China, Morocco, Saudi Arabia, Russia and the U.S. Meanwhile, an NCGA study of 2023–2025 prices found that U.S. farmers paid more than Brazilian farmers for almost every seed and crop protection

category. The squeeze is exacerbated by an export slowdown. China's retaliatory tariffs reduced U.S. agricultural exports to China by an estimated \$14.9 billion in the last year, with farms in Iowa, California and Illinois hit the hardest. As a result, after rising by 9.1 percent in 2024 and a further 3.8 percent in 2025, U.S. farm debt is forecast to climb another 4.6 percent in 2026.

U.S. producers must also compete in markets dominated by corporate power. Four global companies control 85 percent of the beef sector, driving down prices paid to farmers and increasing costs for consumers at grocery stores. Corporate consolidation of farmland ownership over the past three decades has created fewer, bigger farms and blocked the next generation of smallholders from accessing land. American agriculture groups have called for greater market control and fiscal support for over a decade, yet both the House Farm Bill, passed in April, and the proposed Senate bill have disappointed U.S. farmers, who say they fail to tackle systemic issues.

Alongside market and economic issues, climate change is eroding crop yields and damaging farmer revenues. The U.S. suffered its worst spring drought on record this year, with 60 percent of land experiencing moderate to exceptional drought, according to the [U.S. Drought Monitor](#). In the past year alone, the USDA has paid out [nearly \\$18 billion in supplemental disaster assistance](#) to farmers and ranchers. Rachel Cleetus, senior policy director at the Union of Concerned Scientists, [has said](#) climate change is “fundamentally altering conditions for U.S. agriculture, creating unprecedented risks and uncertainties for livelihoods of farmers and ranchers.” While subsisting in these conditions, farmers are under pressure to cut carbon emissions by adopting new technologies and techniques. Such changes may have long-term benefits, but the upfront costs and risks—often borne by smallholders alone—are prohibitive.

A number of legislative changes to support smallholders have been proposed in the vacuum left by the Farm Bill: A [new U.S. House bill](#) and companion in the [Senate](#) aim to break up meatpacking monopolies



Extreme weather and heavy demand have depleted U.S. corn reserves, driving up crop prices – good for farmers, bad for consumers. ARVA

Fix the farmer’s economics first, and the practices scale themselves. The uncomfortable truth about regenerative and climate-smart agriculture is that most projects treat the farmer’s finances as an afterthought.

Alexander Zanders, Founder, UfarmX

by blocking them from operating across multiple meat segments; the [Milk from Family Dairies Act](#) aims

to match national dairy production to national demand and introduce price floors; the [Protect Farmland for Farmers Act](#) would forbid corporations from utilizing federal agricultural programs; and the [Fairness for Small-Scale Farmers and Ranchers Act](#) seeks to push back against excessive consolidation by mandating a review of past food-system mergers and putting a moratorium on new mergers. Drought risk is trickier to address; the taxpayer-subsidized Federal [Crop and Livestock Insurance Program](#) provides a backstop—but the U.S. Government Accountability Office



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(GAO) has already flagged it as [high risk](#), and those risks are growing as climate change worsens.

Alongside policy proposals that level the market for smallholders, alternative finance and credit models are emerging that improve the business case for implementing climate solutions. Some are farmer-led initiatives; others come from startups, agribusinesses or public-private partnerships. This report explores how new agricultural technologies and finance frameworks are benefitting both farmers and the environment.

Farmer-First AgTech

In the U.S., a new investment approach is being met with enthusiasm in rural communities. [The Farmers Innovation Fund](#) is a farmer-owned, farmer-led agtech fund, where farmers select the companies, conduct trials and hold equity. The network is nationwide, enabling startups to rigorously test their products on a range of different crops and real-world conditions. Many startups fail because they neglect to consider the end user, but Farmers Innovation Fund coaches agtech towards products that directly improve farm profitability and environmental outcomes. The network currently has 40 startups in its portfolio and has already recorded multiple exits, with checks going straight to farmers.

In July, the USDA certified the fund as a Rural Business Investment Company, a designation that enables Farm Credit System institutions to invest. “By certifying the Farmers Innovation Fund, we’re giving agricultural innovators a direct line to both capital and the producers who will put these technologies to work, and that partnership is what will move new tools from

the drawing board to the field faster,” said USDA Rural Development’s Rural Business-Cooperative Service Acting Administrator Victoria Collin.

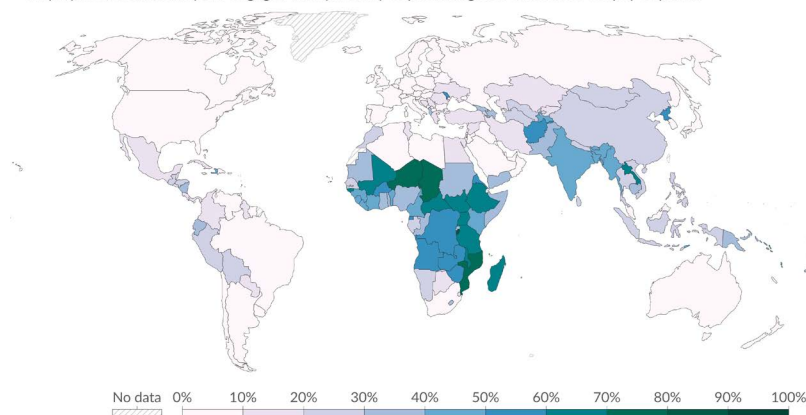
Investment kickbacks are one benefit to farmers. A landscape of genuinely supportive agtech products is another—and the more input growers and ranchers have on design, the better.

Downstream in the food system, this kind of collaborative design is common. In North Carolina, for instance, Alamance Foods runs AFI Labs—a commercialization center for new food and beverage products. Like Farmers Innovation Fund, it provides the environment for technology companies, end users and industry experts to



Share of employment in agriculture 2025

Agriculture includes the cultivation of crops and livestock production, as well as forestry, hunting, and fishing. Employment includes anyone engaged in any activity to produce goods or services for pay or profit.



Data source: ILO Modelled Estimates, via World Bank (2026); Broadberry and Gardner (2013); International Labor Organization (via World Bank) (2013)

Note: Where data for 2025 is unavailable, the value from the closest year between 2020 and 2024 is shown instead.
OurWorldinData.org/employment-in-agriculture | CC BY

co-design a product. And large agtech businesses are increasingly adopting the same user-centric maxim; a new class of digital products for farmers is emerging that targets market access problems. The tools aim to create alternative revenue streams, boost existing ones and increase farms' appeal to potential off-takers.

More agtech players—especially large agribusinesses—are now launching data tools and digital services that put agroecomics at the center. Often, they aim to create new revenue streams, as well as boosting existing ones, by increasing farms' appeal to potential off-takers. U.S.-based Arva, for example, works with farmers, farmer cooperatives and corporations to verify and underwrite farms' field data to

Scaling regenerative agriculture requires a systemic economic shift that rewards farmers for their work.

Jay McEntire, CEO, Arva

produce auditable metrics that can be monetized through emerging environmental markets. Its farm management tool helps farmers produce the information companies routinely ask for, while its “environmental intelligence engine”—built on models co-developed with the U.S. Department of Energy—uses AI analysis to suggest how a farm can reduce its carbon emissions.

“When those field-level improve-

ments are converted into verified, audit-ready outcomes, whether that is a Scope 3 reduction for a global brand, a biofuel credit, or a carbon dioxide removal, they become something a buyer will pay for,” explains Jay McEntire, CEO of Arva. “We run the full program on their behalf, from farmer enrolment and compensation through measurement, verification, and audit-ready delivery.”

Since 2023, Arva has helped farmers regenerate more than 4.4 million acres across nine countries and reduced 3.4 million metric tons of CO²e. It has also returned over \$100 million to farmers, according to company findings. “Farming is a business of heritage, but it remains a business. If the economic system does not support

Futureproofing the Omega-3 Industry in a Changing Climate

An interview with **Matts Johansen, CEO of Aker BioMarine**, a leading human health and nutrition innovator that develops sustainable marine-based health ingredients.



How is climate change impacting the omega-3 supply landscape?

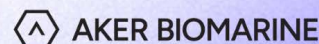
The ocean plays an important role in global nutrition. Today, climate variability, changing ocean conditions, lower fish harvests and growing competition for marine resources are putting pressure on omega-3 supply. Peru's anchovy fishery, a major source of fish oil, is a clear example, with reduced catches, lower oil yields and fishing disruptions limiting supply to human and aquaculture applications.

What does this mean for the future of the industry?

It's all about building resilience and looking beyond short-term supply issues by taking a long-term approach to healthy ocean ecosystems. Responsible fisheries management, science-based decision-making, traceability and adaptability are essential to ensuring marine resources remain available for future generations.

Why is diversification increasingly important?

For brands, incorporating responsibly managed marine sources, such as krill or algae-derived omega-3s, can help diversify portfolios, reduce reliance on a single source and create greater supply flexibility and help build a more resilient omega-3 system that can adapt to changing ocean conditions while keeping pace with growing global demand.



farmers staying in business today, we lose the people required to implement the environmental changes we need tomorrow,” says McEntire.

Carbon Market Revenues

Other models work directly between farmers and carbon markets. Denmark-based Agreeena operates a carbon credit initiative for regenerative farming across some five million hectares of European farmland. The Agreeena CarbonProject pays farmers for verifiable improvements in soil health, using field level data to turn regenerative practices into a financial product.

Farmers submit detailed records—crop rotations, tillage, residue management, fertilizer use—which are

We believe there is real value in the private sector actively engaging in how we protect ecosystems. Rather than simply waiting for regulation, companies can contribute constructively to the dialogue and help develop solutions.

Matts Johansen, CEO, Aker BioMarine

combined with satellite imagery and soil models to calculate how much carbon their fields store. Those results are converted into third party verified carbon certificates that can be sold on voluntary markets, giving farmers

a new income stream for practices like reduced tillage or cover cropping. The model is designed to encourage smallholders toward methods that cut emissions and improve soil fertility, while giving buyers a traceable environmental asset.

It's also the first large-scale agricultural cropland project to be registered under Verra's VM0042 methodology, a globally trusted carbon credit standard. “If regenerative agriculture is going to attract serious capital to continue scaling beyond pilots, the underlying proof has to be trusted by the market. And farmers need to know that if they change the way they've been doing their job for their whole life, it's going to be worth it. They're businesspeople too,” says

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Agreena's chief commercial officer Frederik Aagaard.

With credits offering lower-cost ways for corporations to cut emissions, U.S. interest in voluntary carbon markets is growing too. Yet, although programs that enroll producers and landowners to generate carbon credits are becoming more common, this has not translated into high rates of participation among landowners. Ninety-three percent of U.S. livestock and cropland managers are aware of carbon markets, but the participation rate is just [3 percent](#)—largely due to implementation costs. The USDA in 2023 [recognized](#) that it can play a role in reducing costs by “offering innovative grants and partnerships” but is yet to propose

Scaling regenerative agriculture requires long-term commitment across the value chain. Farmers need technical support, training and economic incentives that make adoption practical and sustainable.

Yuvraj Arora, Chief Commercial Officer, IFF

any new frameworks.

Elsewhere in the world, extractors working in fragile ecosystems have already shown what stewardship-aligned business looks like. In the Antarctic, krill fishers operate under tight monitoring. Independent

science dictates quotas, closures and predator protections, and the industry survives by keeping the ecosystem healthy. Norwegian company Aker BioMarine, for example, observes voluntary restricted zones and catch cut-offs. “It comes down to minimizing the impact of our operations and considering more than the health of the species being harvested, but also accounting for the wider ecosystem, including predators, biodiversity and the spatial and cumulative impacts of fishing activity,” says CEO Matts Johansen. Fishing in common waters and farming on private land may be starkly different enterprises, but lessons on resource management carry over: “Stewardship needs to be part of how companies think about long-

A photograph of a man with a beard and a tan cap, wearing a brown plaid shirt, holding a large clump of dark, rich soil in his hands. He is standing in a cornfield with green stalks visible in the background. The image is partially overlaid by a dark blue and green graphic on the left side.

Farmers don't need promises.
They need solutions.

That's where we come in.

Health for all, Hunger for none

term value creation: protecting the natural systems we depend on is not separate from business resilience, it is a prerequisite for it,” says Johansen.

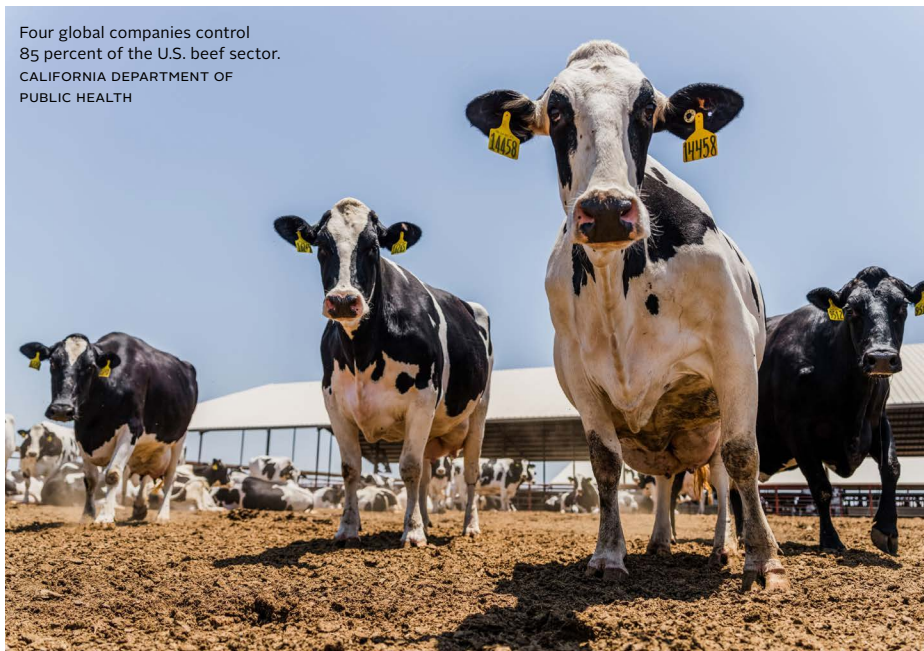
Farm Credit and Finance

Other agricultural finance models sit between farmers, retailers and banks. This is common in low-and middle-income countries (LMICs) in sub-Saharan Africa, where smallholders provide up to 80 percent of regional [food supply](#), yet receive less than 3 percent of its commercial lending.

“Smallholders in Africa can have fifteen consecutive harvests behind them and still be invisible to the financial system,” says Alexander Zanders, founder of agri-fintech platform UfarmX. “Historically, underwriting a smallholder meant a branch visit, manual paperwork, and weeks of process for a loan too small to justify any of it, so institutions rationally didn’t bother. Instead, institutions default to the crudest proxy available, collateral, which she doesn’t have, and the conversation ends before it starts.”

UfarmX uses AI to measure credit risk for farmers in Nigeria, Senegal, Liberia and Kenya who lack traditional collateral. Rather than lending directly, its business-to-business credit infrastructure enables banks and retailers to extend finance. It works in four stages: First, UfarmX partners with input retailers, vetting their inventory and providing software tools that enable access to credit scoring and insurance. Farmers visiting one of these retailers provide basic info, which is processed by an AI model based on geospatial and socioeconomic data to generate an instant credit decision. Approved farmers then receive inputs on credit. The credit is extended by the retailer

Four global companies control 85 percent of the U.S. beef sector.
CALIFORNIA DEPARTMENT OF PUBLIC HEALTH



Methane reduction is transformed into a commercial opportunity by flipping the script on agricultural economics and treating sustainability as the mere price of entry rather than the ultimate value proposition.

Steve Meller, CEO, CH4 Global

and insured by UfarmX for 80 percent of potential defaults. After harvest, farmers repay and build history for larger future loans.

This model is not easy to scale or replicate; it depends on convincing banks, who are often slow to adopt new systems, to integrate its API product. However, Zanders sees African farmer finance as a global food security matter: “African agribusiness generates over \$330 billion in annual revenue today and is projected to pass one trillion by 2030, while the world’s traditional breadbaskets are shrink-

ing. The yield gap between an African farmer and their counterparts elsewhere is not a talent gap; it’s a capital gap, and closing it may be the single highest-return infrastructure project left on the planet.”

It’s not only retailers that can act as alternative lenders. Self-managed lending and investment groups also help to close those capital gaps. They range from the informal to the institutionally recognized, like the Farmers Innovation Fund. In Madagascar, for example, the ingredients company IFF and nonprofit UEBT helped to set up a [Village Savings and Loan Association](#) (VSLA) among vanilla farmers. VSLAs are community alternatives to banks, founded on a methodology [initiated in 1991](#) by CARE International, to address the financial needs of the roughly 2.5 billion unbanked adults worldwide. Groups are typically made up of 15 to 25 people from the same village or community who meet regularly to pool savings and offer each other small, low-interest loans.

In the U.S., community development financial institutions (CDFIs) and farmer co-ops are the closest

Average U.S. farmers spent up to \$1,500 more on fuel refills for onsite machinery during this year's spring planting season compared with last year, as diesel prices soared. ARVA



correspondents. These are becoming more significant in the policy landscape. In February 2026, the Access to Fair Financing for Opportunity and Resilient Development (AFFORD) Act was introduced to strengthen the CDFI Fund's rural reach, with unusually broad bipartisan support. Thirty cosponsors from Montana, Virginia, Idaho, Minnesota, South Dakota, New York, Mississippi, Alaska, North Dakota, Arkansas, New Mexico, Colorado, Alabama, Louisiana and others backed the bill, with lead Sen. Steve Daines [saying](#) CDFIs "help hardworking families and small business owners gain access to the opportunities and capital they need."

Asia presents a different landscape again of go-betweens for smallholders and banks. In India, Better Life Farming—a public-private partnership of Bayer, the International Finance Cor-

poration, Netafim and Yara—works with the country's third-largest private-sector bank, Axis Bank, to extend affordable loans to Indian smallholders. It also provides crop advice and quality inputs via service centers owned and run by Farmer Producer Organizations (FPO), federations, agriculture graduates or local farmers.

India's agroecology is vast and fragmented, with the regulatory headroom for credit innovations. India is the world's biggest producer and consumer of milk, for example, nearly all of which comes from roughly 80 million domestic smallholder dairy farmers. Like U.S. farmers, they face limited access to inputs, finance and markets. The Bengaluru-headquartered startup Stellapps works across the dairy chain—with farmers, dairy companies, veterinarians, input suppliers, banks and regulators—to create

digital records of milk production and quality that dairies and lenders can use. The company's financial services arm, mooPay, creates a creditworthiness score called "mooScore," which is integrated with Reserve Bank Innovation Hub's unified lending interface (ULI) platform. This alternative scoring system—like UfarmX's—unlocks formal credit for farmers traditionally shut out from financial services. With access to better resources, many of the company's 67,000 registered farmers have more than doubled their production since joining, [according to company findings](#). Higher yields have a climate payoff too, as fewer cows produce the same volume of milk, bringing down methane emissions. While the impact per smallholder farm—which may have two to four cows—is small, it becomes significant when multiplied across India's massive milk industry.

Would alternative credit scoring systems like UfarmX's or Stellapps' work in the U.S.? American banks, which are far more heavily regulated than banks in LMICs, would need to approve the tools. American farms and dairies, too, are larger and more consolidated, with stricter data privacy requirements, creating further barriers to adoption. There is demand, however: Research among dairy farmers in Wisconsin has found that [80 percent](#) borrow from at least one nontraditional lender, and that nontraditional credit comprises 17 percent of their total borrowing. And the U.S. dairy sector—which accounts for 11 percent of U.S. methane emissions—has pledged to achieve net zero by 2050, spurring louder debate around how to finance alternative dairy operations. In 2024, a [report](#) by Environmental Defense Fund and the Innovation Center for

U.S. Dairy outlined eight potential new finance models for dairy farmers. They range from lower-cost sustainability-linked loans to blended finance, and even novel cattle feeds—like U.S.-based CH4 Global’s [seaweed-based version](#) that cuts methane emissions by up to 90 percent—incentivized through government funding or carbon markets.

Digital Distaste

Most of these new services, solutions and structures rely heavily on shared data. But many farmers, especially in the U.S., are increasingly skeptical of data reporting. The USDA, for example, has attracted ongoing criticism from agricultural economists and farmers about the reliability of its reports. Reply rates

for its annual prospective planting report dropped to a record low in March, with just over one-third of farmers surveyed giving answers on the number of acres they planned to plant in spring. Replies have almost halved since 2018, [according](#) to government records.

In response, the [USDA unveiled a Data Modernization Plan](#) in September that promises to cut red tape and “put farmers first.” Secretary of Agriculture Brooke Rollins said the approach would reduce paperwork burden for producers and improve acreage and yield estimates. It would also address trust issues by expanding privacy and transparency across agricultural data. Whether the changes will assuage farmers remains to be seen. The USDA is scheduling listening

sessions with producers throughout autumn to gather input and “expects to have results by the end of the current term”.

Self-Sustaining Economy

As Congress struggles to pass the Farm Bill, farmers continue to battle razor-thin margins, and climate uncertainty worsens, a vacuum has appeared where alternative financing models, smaller legislative changes and farmer-led agtech can have a powerful impact. “The farmer has to be the economic center, not the beneficiary. Programs designed top-down die when the funding window closes. When the farmer’s own yield and income improvements repay the capital, the model sustains itself,” says Zanders. ●

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