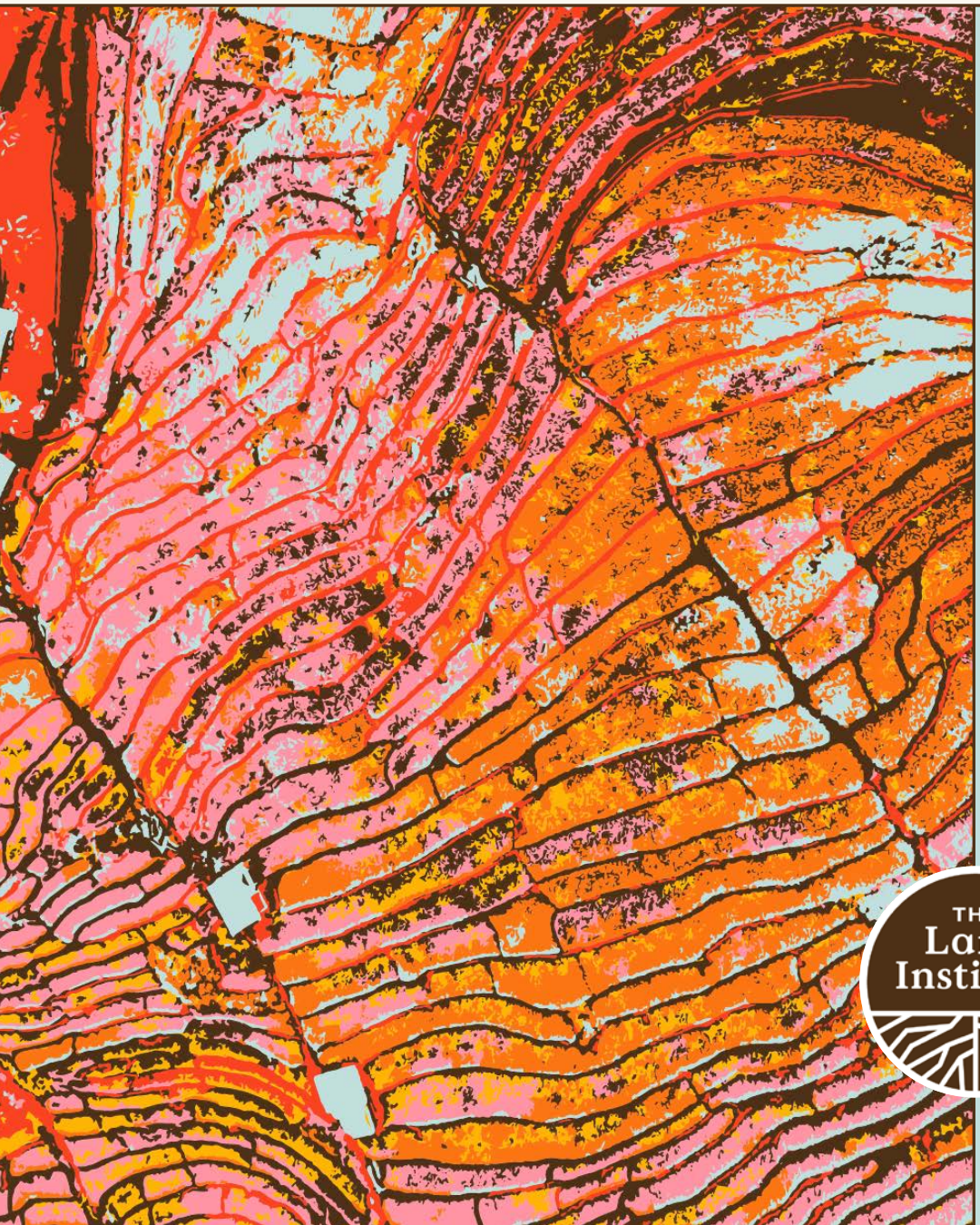
Perennial Impact

2025 REPORT



THE Land Institute

In 2026, The Land Institute is celebrating its 50th anniversary and five decades of patient, determined progress—and looking ahead to imagine what's possible by 2075, 50 years from now.

Healing our agricultural system takes long-term care and a commitment to future generations and the ecosystems we depend on. If we continue to innovate, collaborate, and ask hard questions, then 2075 will be different. We will feed ourselves as part of something greater: the creative, sustaining web of life.

We've already made significant progress. Kernza® proves that a new kind of perennial grain can be bred, grown, and eaten while sequestering carbon, supporting biodiversity, and protecting clean water. Perennial rice offers high yields, resilience, and socio-economic benefits, and shows promise in tropical and subtropical regions already facing climate volatility. Several perennial wheat lines are under evaluation across the globe to optimize yield and perenniality in the field and to ensure the crop will thrive in diverse landscapes. The seeds, methods, and relationships we've developed are shaping what comes next.

Our vision for 2075 is this: Dozens of perennial crops will feed people and restore soils across farmland. The planet will likely be hotter and less forgiving, but our farming will be resilient and help mitigate the worst of a warming climate. Schools will teach the next generation how to grow food in ways that repair ecosystems, rather than deplete them. Communities will steward their food systems—and be nourished by them in return.

This future isn't guaranteed. But it is possible. A global movement is growing from the ground up, and so are the people who will carry it forward.

We have 50 years of roots beneath us. Now it's time to flourish.

Perennially,
Rachel A. Stroer

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Our purpose

The Land Institute leads a global movement to transform agriculture and secure a sustainable future. We develop perennial crops and systems that work with nature to feed humanity and repair our environment.

Our vision

We work for a future in which humanity and nature flourish together as a collaborative system. Where diverse, perennial crops cover our farmlands and build healthy soil, water, and communities.

New look

The Land Institute has a new logo, website, look, and feel! This new chapter in The Land Institute's nearly 50-year history reflects the breadth of the global perennial agriculture movement, which is working to transform food systems for people and the planet across six continents. We're cultivating a perennial revolution—one seed, one field, one relationship, one story at a time—while creating a world where farmers, eaters, donors, researchers, and communities collaborate to grow abundant food, create social and economic growth, and heal the environment.

Our theory of change

We believe that to secure a future for humanity, we must transform agriculture. Today's agricultural and food systems come with environmental, human, and economic costs. Many agricultural research institutions pursue minuscule yield increases rather than challenging the overall structure of our agricultural system, keeping our communities at risk against future vulnerabilities.

Our vision leads with fields of diverse mixtures of perennial grains that promote a long-term approach to food and farming, build ecological resilience, and support prosperous communities. We pursue a future where humanity and nature flourish as a collaborative system, where perennial crops support healthy soil, water, and the people who care for them.

Researchers across plant breeding, social science, ecology, and food science disciplines are developing the pathways to this perennial future we imagine. The Land Institute provides thought leadership and scientific guidance to galvanize the work of other researchers in nearly 30 countries worldwide, and we work with communities to determine how to develop and deploy perennial grains to meet their unique needs.

To create short- and long-term food systems change, we mobilize and accelerate a global movement to realize perennial agriculture, working in partnership with Earth's dynamic systems.

We generate this change by:

- Building the scientific tools and processes required to replace soil-disturbing and resource-intensive aspects of food production with ecologically sound agricultural systems
- Evaluating and reconfiguring current aspects of our food systems to create space for perennial grain solutions in the near-term
- Leading the long-term movement to transform agriculture for future generations by expanding the use of multiple perennial grain crops at scale globally

By leading this transformation, we can establish a more resilient agriculture that allows us to grow abundant food, repair environmental harm, and sustain farmers and their communities in their home places worldwide.

Perennial grains as viable annual grain alternatives

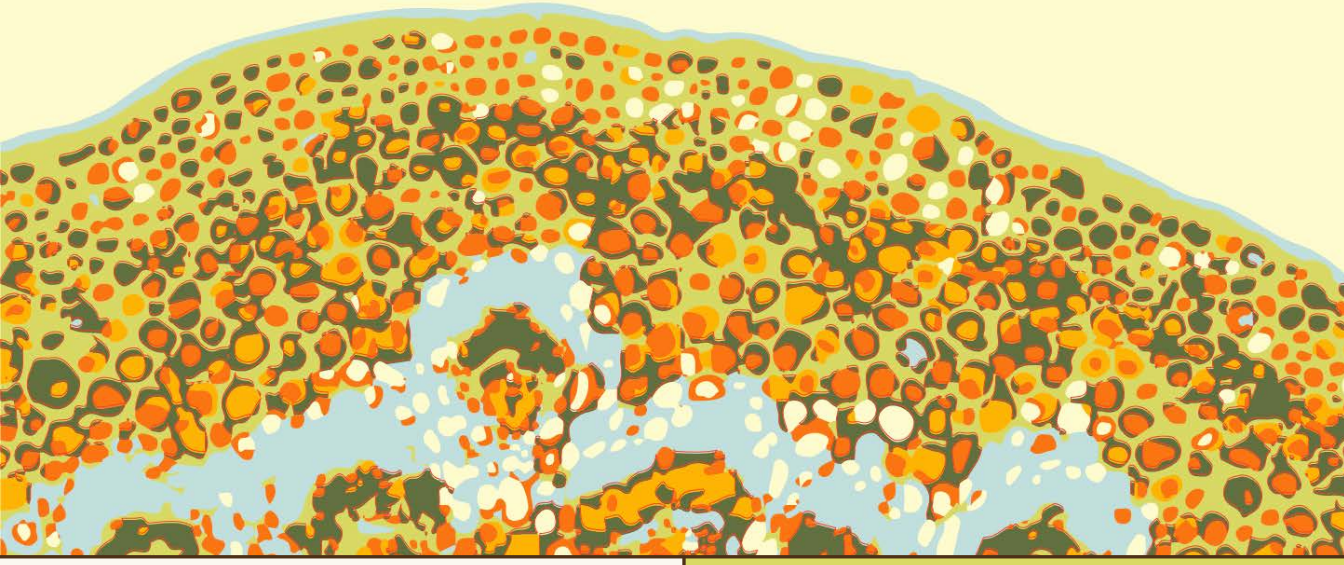
High-yielding, robustly perennial grain crops could replace annual grain crops and produce ecologically sound agricultural systems that feature crop diversity, healthy soils, and sustainable water and nutrient cycling.

Perennial wheat is on the cusp of its own perennial future as a viable new grain crop. After 20 years of consistent plant breeding and development, along with recent global research support and a community engaged in studying the crop's perenniality across the United States, our program has successfully developed five stable perennial wheat lines that have thrived in the field for two years. An additional 20 perennial wheat lines showed stronger perenniality or improved grain yields, even under harsh Kansas weather conditions. As the global research network continues to advance breeding, field studies, and nutritional research, perennial wheat will be a new agricultural tool that farmers can use to feed their communities and sustain them—like winter wheat has sustained Kansas farmers—but with the perennial persistence and ecological benefits of the native prairie.

Scientists also explored how Kernza® perennial grain could serve as an innovative new crop option in different parts of the globe as an alternative to major grains like wheat. Through international collaborations with The Land Institute's Kernza domestication program, Ukrainian researchers

Replacing the status quo with perennial grains

The Land Institute is committed to driving positive social, environmental, and economic change. To accomplish this, we are developing the necessary tools and processes to substitute perennial grains for practices and systems that do not adequately address the full range of existing challenges in agriculture.



evaluated the Kernza variety TLI-801 (developed by The Land Institute) to study its potential in their own environment. Researchers found this variety promising for Ukrainian agricultural landscapes and are releasing it for local use under the name "Саліна," which roughly translates to "Salina" when spoken, as a nod to our Kansas origins and the parallels between the agricultural histories and economies of these two distant yet connected regions. Once global collaborators obtain food safety approval for Kernza in the European Union (EU) and establish markets, this regionally suitable variety could eventually serve as an alternative to wheat in the country and restore fertility in some of its degraded soils.

By establishing long-lived alternatives to major grains that allow farmers to plant once and harvest for three or more years without replanting, a perennial food production system could deliver holistic benefits to ecosystems and people alike. •

"Through global collaboration, we can develop long-lived perennial grains that equip farmers to greatly improve soil health through agriculture."

Tim Crews, Chief Scientist, Director of the International Inititative

REPLACING THE STATUS QUO

Prototyping alternative cropping systems with diverse perennial grains

The Land Institute continues to build the scientific knowledge needed to establish diverse, climate-resilient cropping systems that support people and the planet while producing food. These systems allow us to address common problems in annual agriculture, such as pests, soil erosion, the use of chemical inputs, and the loss of water, soil nutrients, and organic matter. Several teams at The Land Institute improved our understanding of perennial cropping systems by:

- **Pursuing Kernza perennial grain and alfalfa intercropping experiments** to understand the extent to which nitrogen provided by alfalfa, a legume crop, could satisfy nitrogen needs in Kernza production compared to synthetic fertilizers

- **Studying the drought tolerance of Kernza, silflower perennial oilseed, and perennial Baki™ bean** to understand how farmers could substitute perennial grains for current crops in water-scarce regions such as the Colorado River Basin

- **Measuring how soils under Kernza perennial grain production can increase soil carbon** to reduce agriculture's contribution to climate change, accomplished through the collaborative Kernza Carbon Network project between The Land Institute and Natural Resources Conservation Service (NRCS). Insights will inform a county-level Kernza soil carbon storage model that stakeholders in the US can use to determine the impact of their crop.

Developing a rigorous scientific understanding of how perennial grain cropping systems may provide drought tolerance, use nutrients efficiently, and store carbon creates confidence in their viability as climate-resilient alternatives to current food production methods, providing the tools for a sustainable food future.

Advocating for perennial grain agriculture policies

Advocacy by researchers, farmers, eaters, and enthusiasts is essential for establishing perennial practices as a new agricultural paradigm. Policy change in local, state, and federal food and agriculture programs can reduce risk for supply chain participants. It can also support the development of emerging perennial crops as reliable alternatives to current commodity crops such as corn, soy, and wheat.

In the summer of 2024, The Land Institute's President, Rachel Stroer, hosted our first-ever Washington, DC, advocacy "fly-in" alongside Kernza® perennial grain distributors David Stennes, owner of Arcola Farms of Minnesota, and Brandon Kauffman, farmer and co-owner of Sustain-A-Grain of Kansas. This group met with several US House and Senate congressional members and USDA staff to educate on how agricultural policy and government support for perennial grains can benefit the nation's farmers, consumers, and natural resources. Follow-up visits to Washington, DC, by Land Institute staff will continue to advance relationship-building and advocacy efforts with federal offices.

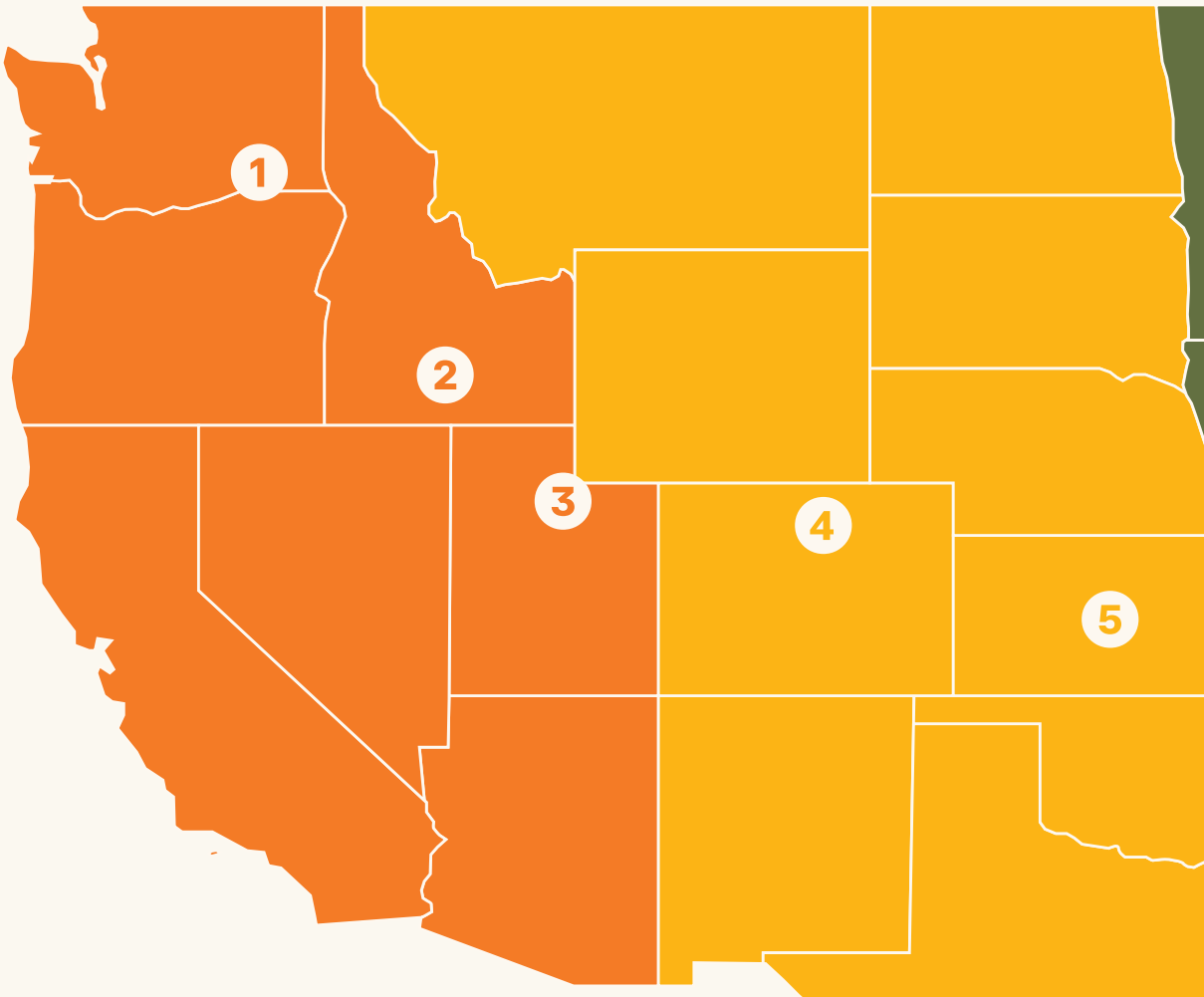
Reconfiguring existing systems to support perennial grains

To ensure that communities growing, eating, and engaging with diverse perennial grains can create more regenerative food systems on local to global scales, we must fine-tune existing systems to make space for impactful perennial agriculture solutions.

The foundation for these conversations was built on existing on-farm support for Kernza within the Natural Resources Conservation Service, Environmental Quality Incentives Program (EQIP), strong research relationships with USDA Agricultural Research Service (ARS) scientists, Kernza community engagement at the USDA's annual Agricultural Outlook Forum, and growing momentum for the Kernza market. •

David Stennes, Rachel Stroer, and Brandon Kauffman

National USDA collaboration sites



1 Pullman, WA

TRIAL & EVALUATION SITE

- Dryland Systems

2 Kimberly, ID

TRIAL & EVALUATION SITE

- Irrigated Systems

3 Logan, UT

TRIAL & EVALUATION SITE

- Semi-Arid Production Systems

4 Fort Collins, CO

LAB, TRIAL & DATA COORDINATION SITE

- Brewing, Baking, and Grain Quality Lab
- Dryland and Irrigated Systems
- Livestock Utilization

5 Salina, KS

BREEDING SITE

6 St. Paul, MN

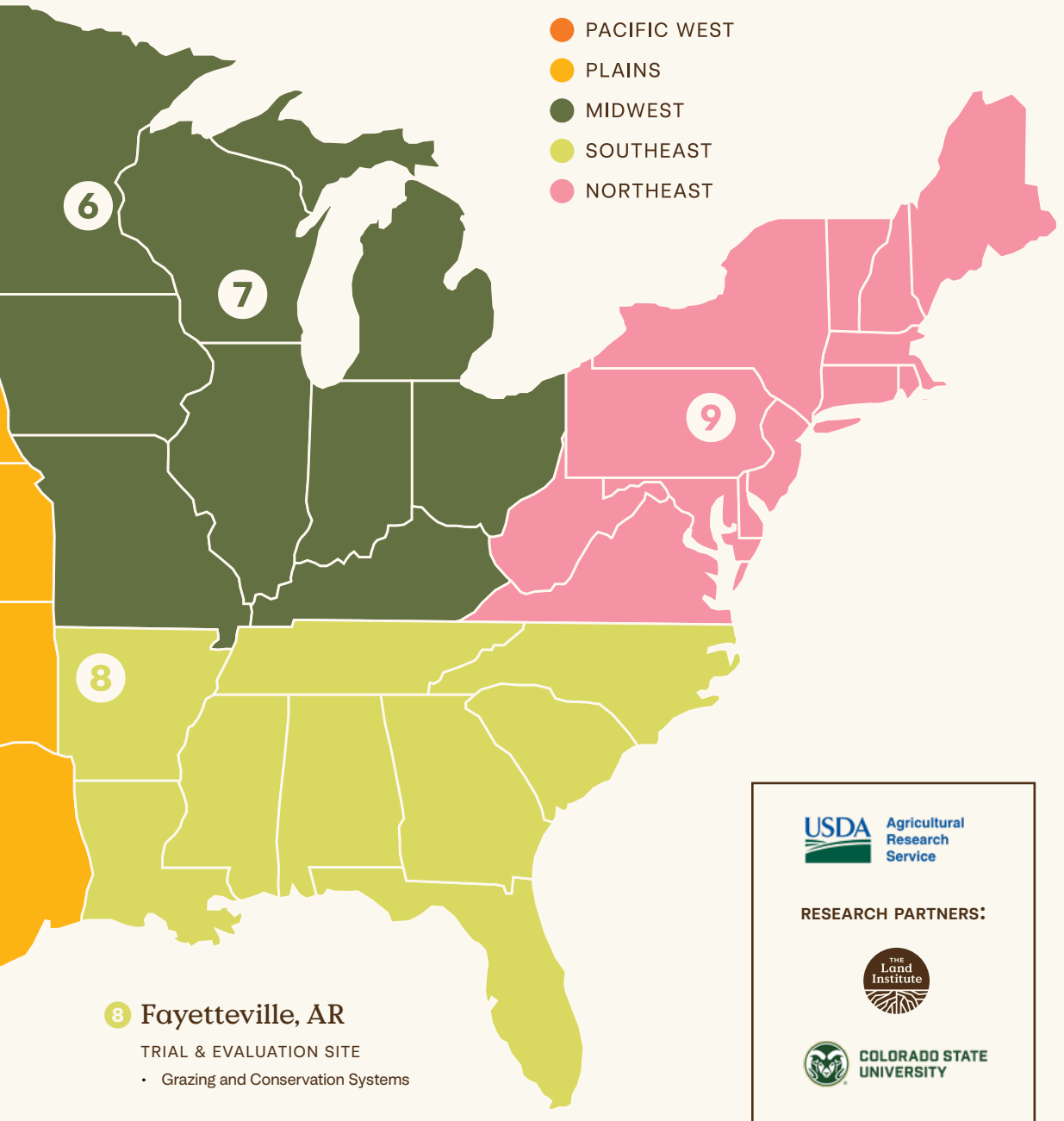
BREEDING & LAB SITE

- Forage and Soil Quality Lab
- Crop and Grazing Systems

7 Madison, WI

TRIAL & EVALUATION SITE

- Crop and Grazing Systems



8 **Fayetteville, AR**

TRIAL & EVALUATION SITE

- Grazing and Conservation Systems

9 **Univ. Park, PA**

TRIAL & EVALUATION SITE

- Crop, Grazing, and Conservation Systems

USDA Agricultural Research Service

RESEARCH PARTNERS:

The Land Institute

Colorado State University

University of Minnesota

This image was reimagined based on the work from Grace Miner, Ph.D. Research Agronomist, USDA-ARS.

Perennial grains' potential as new staple foods

For diverse perennial grains to move onto our landscapes and plates, researchers and communities are advancing food safety and nutritional findings, reducing barriers for adoption, and establishing meaningful human and cultural relationships with new perennial grain foods so they may serve as staples for communities.

Staple foods such as rice and wheat comprise a significant portion of people's diets and have a valuable role in enhancing their food security, economies, and culture. To strengthen the relationship between people and perennial grain crops for current and future generations, we aim to position emerging perennial grain crops as staple foods. Several teams at The Land Institute pursued this work across multiple crops and focus areas:

- Our perennial legumes team, working to understand the nutritional value of perennial Baki™ bean, revealed exceptionally high protein potential, positioning it as a promising perennial pulse crop for food and feed applications.

- Our perennial oilseeds team developed innovative methods to enable high-quality oil extraction from silflower, a perennial sunflower relative native to many parts of the US, by improving seed dehulling efficiency and incorporating new equipment.

- Dr. Evan Craine from The Land Institute's Crop Stewardship team is building knowledge to advance perennial grain foods as edible, nutritious, and viable components of supply chains and to understand how they can become an essential staple food for communities. This work was recently supported by a Foundation for Food and Agriculture Research (FFAR) New Innovator Award.

- Our Crop Protection and Crop Stewardship teams developed methodologies for monitoring the quality of farmers' Kernza grain by collaborating on the first-ever Kernza Annual Monitoring Program (AMP).

As scientists continue to strengthen research on the benefits of perennial grains as new foods with nutritional and cultural value, communities can begin to integrate them into their daily lives in ways similar to other staple crops, such as wheat and rice, which have provided sustenance and significance to human societies for millennia. •

Redefining approaches for perennial grain crop valuation

The Land Institute and University of Wyoming researchers examined how the economics of Kernza production compare with those of annual wheat-fallow (leaving the ground unplanted for a period after wheat harvest) by analyzing crop budgets for perennial and annual cropping systems in Wyoming. This research provided farmers with a holistic view of Kernza production costs and savings from field operations, labor, government support programs, and more, supporting informed financial and agronomic decisions when integrating perennial grains into their operations.

This research revealed that Kernza may serve as a viable alternative to dryland wheat-fallow production systems in the southeastern portion of the state, especially under increasingly common climate stressors such as drought. This research may also prove useful beyond Wyoming, as communities expect to face variable temperatures and precipitation.

Creating an ethical infrastructure for perennial grain research and adoption

Developing and growing an equitable movement of perennial agriculture researchers, farmers, advocates, and community members requires that we root diverse knowledge, ethical data governance, mutually beneficial partnerships, and more into the fabric of how we work.

Our Perennial Cultures Lab initiated this process by:

- **Investigating** the long-term governance of traditional ecological knowledge and intellectual property in perennial grains
- **Bringing** new researchers to its team to advance research around the cultural relevance and social impacts of perennial grains
- **Pursuing** ongoing research to consider how different genetic technologies may or may not support perennial grain crop development and research goals at our organization

Transforming agriculture for the future with perennials

Perennial agriculture can address the pressing problems people and the planet face today while also creating a sustainable future for generations to come. This transformational change requires us to activate and lead a global movement of people who are empowered to respond to a changing climate with an agriculture that repairs our relationship to the soil, water, and air upon which all life depends.

As it continues to unfold over time, this work will ensure that The Land Institute can make organizational decisions that enable informed growth of the perennial agriculture movement—bioregionally, nationally, and globally—by embedding reciprocity and accountability to the diverse perspectives and people that inform our work.

Our perennial sorghum program put this work into action by ensuring that perennial grain-breeding outcomes are not only scientifically robust but also locally relevant and aligned with the needs of smallholder farmers. Through collaboration with farmer organizations in Uganda, the National Semi-Arid Resources Research Institute (NaSARRI), Makerere University, and with support from the McKnight Foundation, this research collective incorporated what the farmers see as they grow food—a changing climate, soil degradation, and declining yields—into breeding goals to develop regionally adapted perennial grains.

To accomplish this goal, researchers and farmers worked jointly to combine participatory on-farm evaluations with multi-environment breeding trials, helping identify varieties that fit local food systems, labor realities, and environmental conditions. Their evaluations focus on practical traits such as grain yield, plant height, ease of harvesting and threshing, pest and disease resistance, and the ability of plants to regrow after harvest. Several of the varieties preferred by farmers have also ranked among the strongest performers in scientific trials, highlighting the alignment between breeding objectives and farmer priorities. By testing perennial sorghum directly in partnership with farmers and conducting complementary trials in the United States, our perennial sorghum program is advancing resilient crop options that can contribute to soil health, farm productivity, and long-term food security in East Africa. •

Pathways to a Perennial Future: 2025 International Meeting

In March 2025, 95 researchers, nonprofit leaders, and institutional partners from 25 countries gathered at the Center for Maize and Wheat Improvement (CIMMYT) campus in Texcoco, Mexico—the birthplace of the Green Revolution, where agricultural innovation once drove significant crop yield increases but also led to widespread soil loss and declining biodiversity. This time, researchers gathered to plant seeds of a different future—one rooted in regeneration, place, and partnership.

Co-hosted by The Land Institute and CIMMYT, part of the global agricultural innovation network CGIAR (Consortium of International Agricultural Research), the meeting aimed to accelerate perennial grain research, deepen collaboration, and build global infrastructure and movement for resilient food systems. Attendees shared research breakthroughs, discussed policy and scaling barriers, and developed concrete next steps across regional hubs, networks, perennial grain crops, and working groups.

A spirit of scientific rigor and rooted partnership defined the meeting. As CGIAR's Chief Scientist Sandra Milach noted in her opening remarks, "this is the time to commit, to deepen and expand the work required to make perennial crops the next generation of agricultural crops."

PATHWAYS TO A PERENNIAL FUTURE:

Key outcomes and insights

1 Scaling perennial grains for a changing climate

Progress across multiple crops—Kernza®, perennial wheat, perennial rice, perennial sorghum, and pigeon pea—demonstrated that decades of committed breeding are beginning to deliver meaningful agronomic and environmental benefits.

2 A call for a "Perennial Revolution"

Attendees called for a paradigm shift in how we fund and implement agriculture—moving beyond short-term, yield-centric models to long-term systems that prioritize deep roots, resilient ecosystems, and equitable regional adaptation.

3 Regional hubs and global research networks

Participants discussed new and emerging regional hubs and formalized hubs to collaborate on carbon modeling, genomic infrastructure, crop-specific collaboration, and more in East Africa, Europe, East Asia, Latin America, and North America.

4 Investing in leadership through community and mentorship

Many of today's leaders in the perennial grain movement began their journey as graduate fellows at The Land Institute or through collaborations with early partners. Several returned to this meeting with their own graduate students—a testament to how sustained mentorship, community, and training are fueling intergenerational leadership in the movement.

5 Key milestones

For the first time, CIMMYT planted Kernza and perennial wheat trials and allocated space in its germplasm bank (living genetic material, such as seeds) for perennial crops.

These outcomes represent a significant step forward for the legitimacy and momentum of perennial grains on the global stage. They will help ensure that our transformative perennial grains solutions are locally led, accessible, adaptable, culturally valued, and economically viable. •

“Moonshot” solutions for food security in a changing climate

At the start of 2025, The Land Institute joined more than 150 Nobel and World Food Prize Laureates in signing the Laureate Letter—an unprecedented global call to action urging investment in “moonshot” agricultural solutions to ensure food security in a changing climate. Of the seven high-impact strategies outlined in the letter, two were at the core of The Land Institute’s mission: transforming annual crops into perennials and diversifying cropping systems to build climate resilience.

The Laureate Letter emphasized the need for governments to invest in biological and genetic breakthroughs, particularly the development of perennial crops and diversified cropping systems, to enhance food security and climate resilience. These advancements are essential for long-term food security as communities face unpredictable weather, soil loss, land degradation, resource scarcity, and biodiversity loss.

By signing this letter, The Land Institute stood with global leaders to demand urgent investments in food security, climate resilience, collective action, and science.

This call to action from Nobel and World Food Prize Laureates wouldn’t exist without the decades of work led by The Land Institute. The very concept of a future of perennial agriculture—now recognized as essential to global food security—was catalyzed by our research, partnerships, and vision. Nearly 50 years ago, The Land Institute challenged the current model of annual grain production and set out to develop an alternative: deep-rooted, soil-building, climate-resilient perennial crops.

Today, that vision is taking root—thanks to the commitment of researchers, farmers, ranchers, businesses, donors, and advocates who have propelled this work forward. •

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THE Land Institute

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Sign up for our newsletter at the bottom of our website to learn how we are growing a more resilient food system.

Join the movement to transform agriculture

Whether you give monthly, contribute annually, or support this work through a foundation, your involvement helps shape a perennial future that can feed people and repair our planet at the same time.