



FOUNDATION FOR  
FOOD & AGRICULTURE  
RESEARCH®

Bold science for big challenges



# A Decade of Advancing Bold Food & Agriculture Research

2024 IMPACT REPORT



## Bold Science for Big Challenges

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## Letter from Our Executive Director

# Welcome

The [Foundation for Food & Agriculture Research \(FFAR\)](#) had a momentous year in 2024 as we celebrated a major milestone, FFAR's 10<sup>th</sup> anniversary. It's amazing to look back on the last ten years and see the impact that our small but mighty organization has had on the food and agriculture sector.

Over the past decade, FFAR has awarded over 400 grants in 46 U.S. states for a total of almost \$800 million invested in agriculture research with more than 550 partners.

In addition to funding audacious food and agriculture research, a cornerstone of FFAR's mission is to support the development of the next generation of food and agriculture scientists. As new pests, pathogens, diseases and other external factors threaten U.S. agriculture, it is imperative that we have a well-trained workforce to develop innovative solutions that benefit farmers.

Through eight scientific workforce development programs, FFAR has supported approximately 300 fellows over the past decade. These fellow are gaining unparalleled experience that help them excel in the workforce, including developing research skills, exploring nontraditional career opportunities, receiving valuable industry mentorship and honing soft skills.

Since FFAR's creation in the 2014 Farm Bill, the need for agricultural research has become increasingly apparent. Investments in agricultural research help the U.S. to remain innovative and agile so we can respond quickly to emerging threats, provide U.S. farmers with the tools they need to thrive and ultimately ensure we continue to produce safe, affordable, nutritious food. As new challenges have cropped up in recent years, from the COVID-19 pandemic to deadly viruses like avian flu, FFAR and our partners have met the moment by quickly investing in actionable research.

FFAR regularly engages with stakeholders, farmers, commodity groups and others across the food and agriculture value chain to ensure we fund research that benefits farmers and consumers. Although scientific research can take years to yield results, FFAR is already seeing the fruits of our labor in actionable results and impact on farmers' fields. We continue to evaluate our systems and processes, specifically related to monitoring, evaluation

and learning, to optimize FFAR's research programs and deliver maximum impact.

In this report, you will read about some highlights of FFAR impacts over the last decades. These impacts include:

- Outcomes from one of FFAR's first programs, the Pollinator Health Fund, that demonstrate the major impact bees have on local ecosystems;
- Improvements to swine health and overall productivity and producer profitability;
- Innovative strategies and farmer-friendly practices to safeguard strawberry crops from an aggressive disease;
- New dashboards to track food vulnerabilities across the supply chain;
- A new system to keep food fresher for longer and reduce food waste;
- Guidelines to assess fertilizer use efficiency and protect farmer profitability while conserving resources;
- Better control measures for ripe rot, a fungal disease that affects mid-Atlantic vineyards.

I am proud of the work we have accomplished so far and also invigorated by what lies ahead for the Foundation as we continue to work alongside our many partners from commodity groups, the private sector, NGOs, academia and others. FFAR could not achieve these pioneering impacts without the support of our stakeholders and those willing to co-invest in research with us.

Thank you for your continued support as we work together to support audacious science that addresses today's food and agriculture challenges. We are thrilled by the success of our first ten years and look forward to the next decade as we continue to invest in bold research that advances U.S. agriculture.



Saharah Moon Chapotin, Ph.D.  
Executive Director  
Foundation for Food & Agriculture Research













# What We Do

The Foundation for Food & Agriculture Research (FFAR) builds public-private partnerships to support bold science. Our research, co-created with the agriculture community, increases public agriculture research investments, fills critical research gaps and complements the U.S. Department of Agriculture's (USDA) research agenda.

## Priority Area Research

FFAR-funded research focuses on four Priority Areas:

### Cultivating Thriving Production Systems

Our Production Systems research supports animal and crop systems by increasing productivity, combating pests and disease, supporting animal welfare and safeguarding farmers' livelihoods.

### Sustaining Vibrant Agroecosystems

Our Agroecosystems research deepens our understanding of how agriculture systems interact with the surrounding environment.

### Bolstering Healthy Food Systems

Our Food Systems research promotes the availability of nutritious foods, improves human health, develops novel food processes and products and advances the U.S. food system's functionality.

### Strengthening the Scientific Workforce

Our Scientific Workforce programs continue our longstanding commitment to address critical shortages in research and scientific workforce training.

## Our Mission

We build collaborative partnerships to support audacious science addressing today's food and agriculture challenges.

## Our Vision

We envision a world in which pioneering, collaborative science provides every person access to affordable, nutritious food grown on thriving farms.

# 2024 Year in Review

2024 marked FFAR's 10<sup>th</sup> anniversary of building partnerships to fund critical food and agriculture research. We highlighted our decade of impact throughout the year with special programming and events. FFAR also continued advancing our Research Strategy with convening events, funding opportunities and rapid response grants addressing emerging challenges. Below is a recap of the year.

## 10<sup>TH</sup> Anniversary Webinar Series

The Foundation hosted 11 webinars in 2024 to highlight the impact of FFAR-funded research. These webinars focused on the value of public-private partnerships, the role of research in mitigating diseases that impact the swine industry, the importance of scientific workforce development and more. Participants from across the U.S. and the world tuned into these engaging discussions.

## Convening Events

Consistent with FFAR's process for developing research to meet industry demand, the Foundation convenes stakeholders around a specific research topic to identify farmers' needs, research gaps and potential partners prior to establishing a research program. FFAR held eight convening events focused on topics ranging from bolstering specialty food crops to protecting the U.S. dairy herd. From these events, FFAR is already launching four projects in 2025, with more in development, to ultimately establish rigorous research programs that address farmers' urgent concerns.

## Addressing the H5N1 Outbreak

FFAR's Rapid Outcomes from Agriculture Research (ROAR) program provides rapid funding in response to emerging pests and pathogens. In 2024, FFAR welcomed proposals for urgent research focused on the H5N1, or avian influenza, outbreak. To date, the ROAR program has funded five out of 11 received proposals on avian flu developing tools, tactics and technology to mitigate the effects of H5N1 on animal welfare and farmer profitability.

## Attracting the Right Talent

In 2024, FFAR filled two important leadership roles:

- [Katherine Ayers](#) permanently accepted the chief financial & operations officer position after initially serving as FFAR's interim chief financial officer.
- [Kamel Chida](#) joined FFAR as vice president of partnerships & development. Chida is an accomplished advisor with extensive experience in business development, innovation and partnership strategy within the food and agricultural sectors.





# 10<sup>TH</sup> Anniversary Celebration

To celebrate FFAR's decade of funding critical food and agriculture research, our partners, grantees, Members of Congress and staff gathered in Washington, D.C. for an event to highlight our impact. In addition to remarks from FFAR Executive Director Dr. Saharah Moon Chapotin and Board Chairman Dr. Mark Keenum, speakers included:

- Senator Debbie Stabenow (D-MI), then Chair of the Senate Agriculture Committee, provided recorded remarks about FFAR's successes and the importance of agricultural research.
- Dr. Sally Rockey, FFAR's executive director emeritus, shared recollections from the Foundation's early days.
- Dr. Kathy Simmons, the National Cattlemen's Beef Association's chief veterinarian, highlighted the value of co-funded research projects including the Sustainable Beef Research Roadmap, which will be published in 2025.
- Dr. Daniela Pezzini, a FFAR Fellow alumna, shared how the fellowship set her up to succeed in the workforce.
- Kirk Pumphrey, an almond producer on the West Coast, explained how his orchards are benefiting from [FFAR-funded research](#).



*FFAR-funded researchers reflect on FFAR's 10 years of food & agriculture research.*

# FFAR Grants 2016-2024

408

GRANTS AWARDED

550+

FUNDING PARTNERS

\$796M

FFAR & MATCHING  
FUNDS AWARDED

\$1:\$1.40

RATIO OF FFAR FUNDING  
TO MATCHING FUNDS

FFAR is Addressing Food

## PROTECTING THE U.S. SWINE HERD

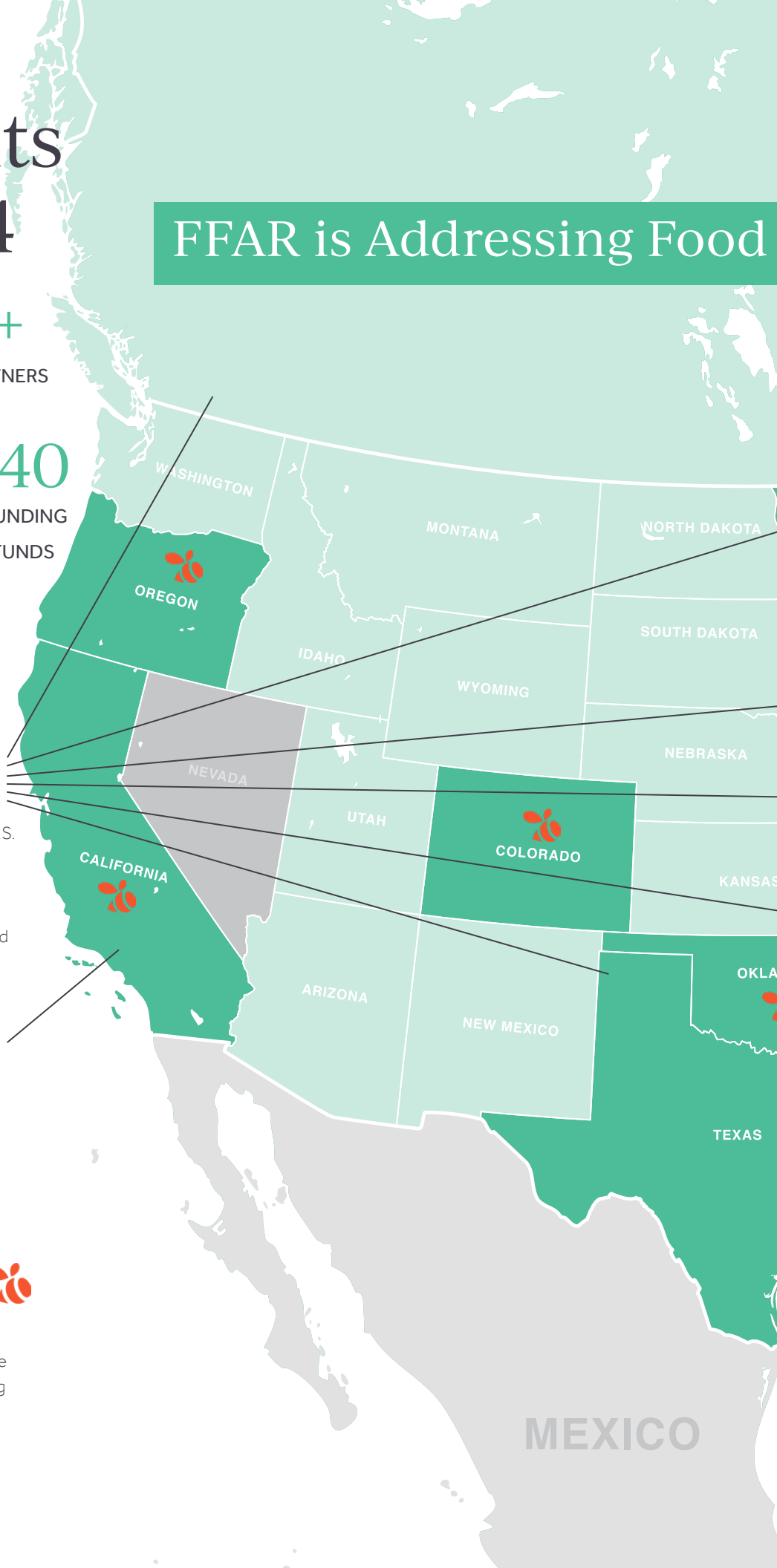
To help control the next emerging disease in the U.S. pork industry, FFAR is investing in cost-effective, innovative technologies, protocols and ideas to enhance biosecurity implementation during the wean-to-harvest phases of swine production. Read more on page 13.

## BATTLING DISEASE THREATS TO STRAWBERRIES

California grows 90% of the nation's strawberries. FFAR-funded researchers are protecting this valuable crop from devastating fusarium wilt. Read more on page 14.

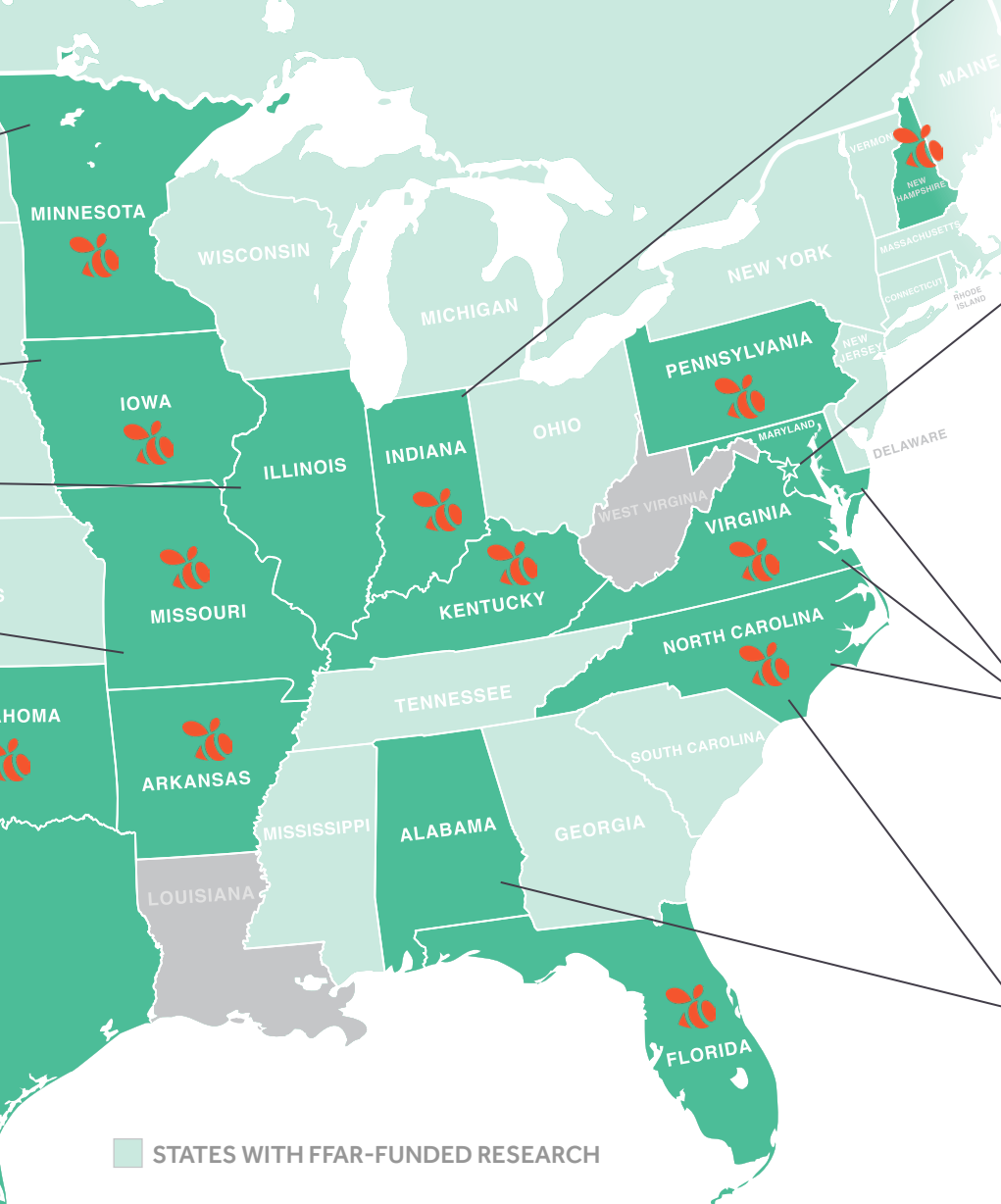
## SUPPORTING POLLINATOR HEALTH

One of FFAR's earliest programs focused on protecting pollinator health. Across 15 projects, the Pollinator Health Fund yielded results that are being employed across the U.S. Read more on page 17.



# & Agriculture Challenges

CANADA



## TRACKING DISRUPTIONS TO THE FOOD SUPPLY CHAIN

Tracking potential disruptions to the food supply chain is vital to protecting consumer food access and farmer profitability. A FFAR grantee developed dashboards to identify potential disruptions. Read more on page 21.

## SETTING THE STANDARDS FOR EVALUATING FERTILIZER USE

Members of the Efficient Fertilizer Consortium developed protocol and data guidelines for evaluating enhanced-efficiency fertilizers in field trials. The resulting guidelines are the first set of aggregated standards for evaluating fertilizer use. Read more on page 18.

## THE FUTURE OF MID-ATLANTIC VITICULTURE

Grapevine ripe rot is threatening the productivity of the burgeoning wine industry in the mid-Atlantic. FFAR Scientific Workforce Development grantees are providing growers tools to protect their crops. Read more on page 26.

## REDUCING FOOD LOSS & WASTE

Nearly 30% of global food production is lost at some point in the supply chain, resulting in tons of waste. A FFAR grantee developed a chemical ice that reduces spoilage and increases shelf life. Read more on page 22.

# Monitoring, Evaluation & Learning Work

FFAR is deepening our commitment to understanding and demonstrating the impact of our investments into critical food and agriculture research and its benefit to U.S farmers. Monitoring, evaluation and learning provides the structure, evidence and insight needed to ensure our programs deliver meaningful outcomes. Through a strengthened monitoring, evaluation and learning function, like updated grantee reporting and third-party external evaluations, we are building systems to track research outputs and outcomes, evaluate program effectiveness and continuously learn from what works. FFAR is committed to data-informed decision-making and highlighting the collective impact of our funded research to food and agriculture stakeholders.

## Impact Reporting

- We updated our reporting systems to strengthen how we track and communicate the results of our research investments.
  - Updates streamline the reporting process, reduce administrative burden for grantees and introduce a new set of standardized indicators to capture quantitative outputs and outcomes, while providing the ability to leverage third-party data sources.
  - Fourteen new indicators are capturing outputs such as:
    - Number of end-user (farmer, policy maker) focused informational articles published by FFAR-funded researchers
    - Number of licensing strategies resulting from FFAR-funded research projects
    - Amount of follow-on funding received to extend or complement the work or the findings of the FFAR-funded research
    - Number of innovation and knowledge products advanced within FFAR-funded research projects, tracked by stage of research, development and deployment
- We piloted the refined Narrative Report and new Indicator Report with about 25 grantees to assess ease of use and validate the data gathering approaches.

## External Evaluations

- We launched a coordinated effort to evaluate a selection of FFAR's research programs with the support of expert third-party evaluators. These evaluations provide independent insight into the real-world impacts of FFAR-funded work, capturing both expected and unexpected outcomes.

- **Rapid Outcomes from Agricultural Research (ROAR) Program Evaluation**

- The external evaluation team determined that the ROAR program successfully filled a critical funding gap enabling rapid-response research on unanticipated agricultural threats by producing 47 practical tools to address 19 pests and diseases in 16 species of crops and animals, several of which reached field readiness. The \$6.4 million investment catalyzed over \$22 million in follow-on funding and demonstrated high-impact potential. Four innovations alone are projected to have \$7.51 million in direct, measurable economic benefit to producers and consumers if 20% of the target population adopts the ROAR-funded innovation.
- The external evaluation team noted ROAR's flexible model rapidly delivered stakeholder-relevant solutions and policy-relevant knowledge, validating its role as a high-leverage, fast-acting investment to mitigate emerging agricultural threats.
  - ROAR research developed tools for controlling South American Palm Weevil, which included pheromone traps and attract-and-kill systems that have been validated in field trials.
  - Additionally, work on Cotton Leafroll Dwarf Virus resulted in new management strategies that have been widely disseminated through scientific publications, industry meetings and digital platforms, ensuring growers have the tools to combat this virus effectively.
- Together, these projects reflect ROAR's effectiveness in translating science into actionable tools that strengthen agricultural productivity.



- **Food Loss & Food Waste Portfolio Evaluation**

- ▶ The evaluation team determined that FFAR's \$15 million Food Loss & Food Waste portfolio of 11 projects developed 17 early-stage innovations—including decision-support models, food waste measurement tools, post-harvest technologies and new food product prototypes—addressing food loss and waste across post-harvest, processing, retail and household segments of the value chain.
- ▶ The evaluation found that while all projects began in the earliest stages of development, over 70% concluded in lab-based or small-scale pilot testing phases, demonstrating significant technology advancement.
- ▶ The evaluation highlighted notable innovations with real-world relevance. For example, Cornell University developed five dynamic models—three biological and two economic—to evaluate and prioritize shelf-life interventions that could cost-effectively reduce dairy product waste.
- ▶ The evaluation reported that 77% of survey respondents believed FFAR's Food Loss & Food Waste portfolio contributed to understanding the causes of food waste, and over 90% of those surveyed indicated FFAR's projects were successful in increasing knowledge.
- ▶ The evaluation's gap analysis revealed both strong alignment and strategic opportunities for future investment. FFAR-funded projects most frequently targeted post-harvest losses, which stakeholders also identified as a high-priority intervention point. The analysis also highlighted underexplored areas with high potential impact; in particular, consumer food preferences emerged as the most commonly cited driver of food waste needing future research.
- ▶ FFAR's Food Loss & Food Waste portfolio successfully generated new knowledge on behavioral drivers, improving measurement and monitoring of food loss and waste and creating a range of decision-support tools and models.

- **Other Evaluations**

- ▶ FFAR launched the Next Generation Crops Portfolio Evaluation in 2024 to evaluate grants and programs that increase crop productivity. Results from this evaluation will be released in 2025.
- ▶ FFAR is launching additional external evaluations in 2025 to assess the impacts of FFAR's research investments in areas such as poultry productivity and welfare, soil health and food systems. FFAR has also commissioned an evaluation of our long-running competitive research program, Seeding Solutions.





# Cultivating Thriving Production Systems

As the overall demand for affordable, nutritious food continues to increase, so do the associated challenges farmers face to produce it. The U.S. agriculture system must maintain productivity and improve animal health and welfare despite severe weather and unpredictable threats from diseases and pests.

FFAR's Production Systems research specifically supports animal, crop and integrated crop-animal agriculture systems.



# Protecting the U.S. Swine Herd

In the U.S., where pork is a major industry, the health of the nation's swine herd is crucial. As the third-largest producer and consumer of pork in the world, the U.S. relies heavily on its swine population, and threats to swine health can harm producers, consumers and the economy.



**“The partnership between the Swine Health Information Center and the Foundation for Food & Agriculture Research highlights the ability of both organizations to maximize the funding of key research to provide solutions that directly address the challenges producers face in maintaining and protecting swine health. The collaborative effort has provided very practical outcomes that producers can use to protect their herds and strengthen biosecurity at the farm and during transportation of pigs.”**

Dr. Lisa Becton, Associate Director,  
Swine Health Information Center

## Protecting a Vital Industry

To protect this vital industry, FFAR partnered with the Swine Health Information Center (SHIC) to develop innovative, cost-effective technologies and practices that improve biosecurity, particularly in the critical wean-to-harvest phases of swine production.

This partnership funded 23 projects, many of which have already delivered valuable insights and tools. These findings are transforming the way pork producers and veterinarians manage the health of swine herds, with immediate, practical applications for farms and transportation systems alike.



## Simple Yet Effective Solution

One project explored ways to prevent the spread of disease in barns. The solution was deceptively simple but incredibly effective: covering exhaust fans with nylon tear-resistant fan socks. In a world where biosecurity measures often seem complicated and expensive, this is a tool that can be deployed quickly and cost-effectively. Many pork operations already own fan socks, and by using them to cover exhaust fans, producers significantly reduce the risk of viruses spreading, making it an ideal addition to any farm's biosecurity plan.

## Clean Trailers, Healthy Swine

Another project focused on swine transportation trailer cleaning practices. Researchers discovered that trailer cleaning protocols need to be tailored to the specific farming systems the trailer visits. This insight allows producers to refine their cleaning practices, ensuring that each trailer is adequately sanitized while also saving producers thousands of dollars by avoiding unnecessary or ineffective cleaning methods.

All the findings, including practical guidelines and actionable recommendations, are freely available to farmers through [SHIC's website](#). As the U.S. continues to be a leader in pork production and consumption, partnerships like the one between FFAR and SHIC are essential in maintaining the strength and sustainability of the swine industry, ensuring that both producers and consumers alike can enjoy a healthy, reliable supply of pork for generations to come.





## Battling Disease Threats to Strawberries

California grows over 90% of the nation's strawberries, fueling a \$3 billion industry and employing 70,000 people. Strawberries are the state's third most valuable crop, but this success is under threat. Strawberry production in California is vulnerable to aggressive soilborne pathogens, most notably *Fusarium oxysporum f. sp. fragariae*, which causes Fusarium wilt. This disease clogs the plant's water system, leading to stunted growth, decay and often complete crop failure.

### Combating a Growing Crisis

FFAR provided University of California, Davis researchers critical funding through a ROAR grant to combat this growing crisis. Led by Dr. Mitchell Feldmann, the project supports innovative strategies, including breeding Fusarium-resistant strawberry varieties, developing early detection tools and testing farmer-friendly practices.

### A Multi-layered Approach

Through partnerships with USDA and private companies like Driscoll's and Plant Sciences Incorporated, the team identified wild strawberry genes with promising resistance. These discoveries, supported by genome-wide mapping and field trials, are being used to develop new cultivars. Meanwhile, farmers and researchers are testing layered approaches, such as biological controls, soil solarization, improved irrigation and field rotations, to reduce the pathogen's impact.

**“The success of our collaborative research and rapid response to tackling an emerging threat wouldn't be possible without support from ROAR, the California Strawberry Commission and both public and private sector breeding programs from around the USA.”**

Mitchell Feldmann, Ph.D., Assistant Professor and Director of the University of California, Davis Strawberry Breeding Program and Research Group



As pathogens like *Fusarium* continue evolving, California's strawberry industry stands at a crossroads. The path forward depends on public-private collaboration, science-based innovation and consistent funding to ensure strawberries remain a cornerstone of American agriculture.









# Sustaining Vibrant Agroecosystems

About half of our planet's landmass supports food production. How we manage this land and the underlying environmental system, or agroecosystem, is vital to sustaining crop production, environmental health and producers' livelihoods. This research deepens our understanding of how agriculture systems interact with the surrounding environment.

FFAR's agroecosystems research seeks to understand and improve the connectivity between soil, water and the environment to produce food while fully sustaining the agroecosystem. This research ultimately helps farmers adopt proven tools and practices that inform management decisions to boost land health and profitability and protect agriculture from severe weather events.



# Reflecting on FFAR's Early Work: Supporting Pollinator Health

In the 1990s, scientists noticed that honeybee populations around the world were in decline. The implications were staggering. Bees, essential pollinators for many of the crops that feed the world, were disappearing, and with them, the future of food production.

## Pollinator Health Fund Launched

Recognizing the profound economic and environmental consequences of declining pollinator populations, one of FFAR's earliest programs, the Pollinator Health Fund, supported research on honeybees and ensured a healthier future for both pollinators and U.S. agriculture. The research didn't stop with honeybees; Pollinator Health Fund research also included native bees, bumblebees and even monarch butterflies.

By combining rigorous field science with stakeholder collaboration, these tools have driven measurable improvements in habitat planning, pesticide safety and landowner-led restoration efforts. Significant domestic and global efforts, including the Pollinator Health Fund research, increased the honeybee population by 47% as of 2021, marking a hopeful turn in the fight to protect pollinators and, by extension, protecting food security. This success demonstrates the power of research, collaboration and action in addressing the pressing threats

to food and agriculture, ensuring that future generations can continue to rely on the invaluable services provided by pollinators.

The Pollinator Health Fund's impact is clear. The program's pioneering research led to more than 75 peer-reviewed studies, over 15 public datasets and the development of several practical tools. These scientifically proven resources equip farmers, landowners and policymakers with the knowledge and strategies needed to create healthier landscapes for pollinators.

## Prairie Strips Reduce Stress

One of the most significant successes came from research on prairie strips, narrow bands of native vegetation planted along agricultural fields. The research found that prairie strips alleviate numerous stressors on pollinators, increasing their interactions with crops and helping them survive winter. These findings directly influenced federal policy through USDA guidance, promoting the adoption of pollinator-friendly practices on 140,000 acres of farmland across 14 states. This translation of scientific knowledge into real-world practice benefits both farmers and pollinators.



## Bee Atlas Programs Vital to Protection

Another pivotal project involved digitizing over 9,500 historic bee specimens, leading to the creation of the Bee Atlas programs. This effort generated more than 140,000 new records of bee occurrences, resulting in the most extensive contemporary bee dataset in North America. The Bee Atlas programs are vital to understanding which species are struggling and how to protect them, securing populations and agricultural productivity.





# Setting the Standards for Evaluating Fertilizers

Farmers face complex challenges, balancing rising input costs and nutrient loss risks that threaten their profitability with the need to maintain, or even increase, crop yields.

## Guidelines Established

In collaboration with scientific experts and industry stakeholders, FFAR led the development of the Field Trial Guidelines for Evaluating Enhanced Efficiency Fertilizers, which were [published in the \*Soil Science Society of America Journal\*](#). These guidelines include minimum data standards and common testing procedures and provide a clear, scientifically backed framework for verifying the claims of fertilizer products on the market. The guidelines are the first publicly available, widely agreed upon protocols for evaluating enhanced efficiency fertilizer products that will enable more consistent research methods for fertilizer trials.

Future FFAR-funded fertilizer research will use the guidelines, which will improve the quality of data that goes into farmer recommendations and enable farmers to make better informed and economically sound decisions about their fertilizer use.



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“While there have been many trials investigating the efficacy of alternative fertilizers, they are often done inconsistently and lack the complete suite of information that would make them more reliable and broadly useful. By leveraging existing protocols from the literature and reaching consensus among experts in academia, industry and extension, these guidelines are sure to be an impactful tool for fertilizer research going forward.”

Dr. Sarah Lyons, Scientific Project Manager,  
Foundation for Food & Agriculture Research

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# Bolstering Healthy Food Systems

Food systems significantly impact human health, the environment and the economy. In a healthy food system, food processors, producers, distributors and retailers have the information and technologies needed to produce nutritious food for consumers.

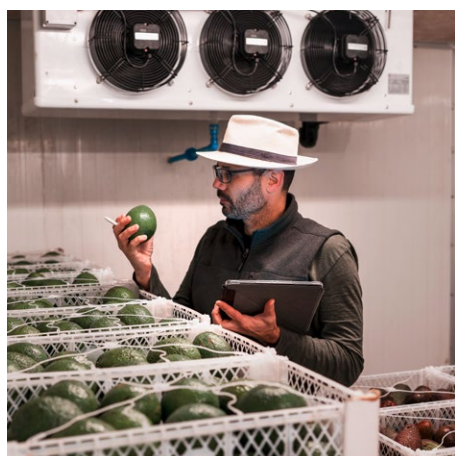
FFAR's Food Systems research promotes the availability of nutritious foods, improves human health, develops novel food processes and products and advances the U.S. food system's functionality. Below are examples of how FFAR's partnerships address pressing food systems challenges.



# Tracking Disruptions to the Food Supply Chain

The COVID-19 pandemic exposed a critical vulnerability in the U.S. food supply chain. As the virus spread, disruptions to production, transportation and distribution created chaos, leaving consumers struggling to find everyday essentials and farmers facing new challenges in getting their products to market. The pandemic highlighted the urgent need for a more robust system

to monitor and respond to disruptions in real time. While the pandemic has ended, the deficiencies remain. Stakeholders across the food supply chain need accurate data to address challenges quickly; however, this data is often not easily accessible to those who need it most—policymakers, supply chain providers and consumers.



## Dashboards for Food Supply Data

FFAR collaborated with Microsoft to fund research that transforms how food supply data is accessed and understood, safeguarding food security. While a Purdue University researcher, Dr. Jayson Lusk created a series of open-access online

**“Public investment in agricultural R&D consistently delivers one of the highest returns in the economy. When private partners are engaged, they put skin in the game, ensuring innovations are not only adopted faster but also tailored to real-world needs. This synergy accelerates impact and maximizes the value of every public dollar spent.”**

Dr. Jayson Lusk, Vice President & Dean,  
Division of Agricultural Sciences & Natural  
Resources, Oklahoma State University

[dashboards](#) designed to provide real-time, credible data on food prices, distribution and the impacts of potential disruptions in an easily digestible format. These dashboards allow stakeholders to make more informed decisions and respond effectively to food crises.



Dr. Lusk developed 10 dashboards that tracked disruptions in four key categories: prices, supply and production, consumer spending and consumer preferences. These dashboards track real-time changes and help identify “hot spots”—areas where supply chain disruptions were most likely to occur. This information gives policymakers and supply chain providers critical insights, enabling them to target resources and mitigate potential problems before they escalate.

## Preparing for Potential Disruptions

Dr. Lusk also developed a vulnerability index, which assessed the vulnerability of nine different food industries across all 50 states. This index helps state planners and agribusinesses better understand which regions and sectors are most at risk, providing them with the data needed to prepare for potential disruptions and protect food security.

In 2022, Dr. Lusk presented this vital work to the U.S. Cybersecurity and Infrastructure Agency's Food and Agriculture Sector, as well as to officials from the USDA and the Food and Drug Administration. His findings provided a clearer picture of where the food supply chain might be most susceptible to shocks and how different regions and industries can minimize the effects.

These dashboards provide a centralized platform for tracking food system disruptions and vulnerabilities. Policymakers, agribusinesses and consumers are using these dashboards to monitor the food system and both anticipate and plan for future crises. With this research in place, the food industry is better prepared to navigate potential disruptions and ensure that food continues to efficiently reach consumers, even in times of uncertainty.



# Reducing Food Loss & Waste

Nearly 30% of global food production is lost at some point in the supply chain, resulting in significant waste. To combat food waste, FFAR invested in the development of functional ice, which revolutionizes how perishable foods are transported and stored.

This innovation creates ice that cools more effectively and releases antibacterial agents as it melts by combining food-grade antibacterial chemicals with ice. This slow release helps eliminate foodborne pathogens and suppress spoilage, which is critical to preserving perishable goods.

## Pilot Tests Prove Effectiveness

FFAR funding allowed Auburn University researchers to build upon earlier studies and refine functional ice. The team conducted extensive laboratory tests, experimenting with different chemical additives to optimize the formula. Researchers also tested the technology under real-world conditions, conducting pilot tests with small-scale fish sellers to gauge its effectiveness in extending the shelf life of

**“FFAR provided us the necessary funding to develop proof-of-concepts of functional ice as well as the First Expire First Out models, which are being leveraged for obtaining more grants and communicating research to the stakeholders.”**

Dr. Amit Morey, Associate Professor,  
Department of Poultry Science, Auburn University

products. Functional ice significantly reduced the bacteria count on the shrimp used in the test.

## A Chilling Effect

By maintaining cooler temperatures during transport and storage, functional ice prevents spoilage and extends food's shelf life by 1.5 to 2 days. For industries like poultry processing, where shelf life is a major factor in profitability, functional ice can significantly reduce food loss at the retail stage. With food losses costing the U.S. poultry industry millions yearly, this pioneering ice presents a viable solution to mitigate these financial losses.

Currently, researchers and a major U.S. poultry company are testing functional ice for commercial adoption. The next phase involves collaborating with ice machine manufacturers and poultry processors to scale up production and further refine the technology. If successful, functional ice could become a powerful tool in the fight against food waste and a game-changer for food safety across various food sectors where ice chilling is essential.











# Strengthening the Scientific Workforce

Addressing the accelerating and unprecedented global challenges faced by the U.S. food and agriculture system requires a dynamic and highly skilled scientific workforce. Developing a workforce with various experiences and perspectives is critical to driving innovation, fostering creative solutions and leading pioneering science.

FFAR's Scientific Workforce programs offer fellowship, grant and award programs that continue our longstanding commitment to addressing critical scientific workforce shortages and supporting the next generation of scientists.

Through eight programs, FFAR has supported over 300 fellows, investing \$45 million into scientific workforce programs that fill gaps in research and prepare scientists for a range of potential career paths.

# Commitment to Achieving Critical Impacts

## Exploring Adjacent Talent Pools

Exploring opportunities to expand the food and agriculture workforce by attracting relevant talent from adjacent and non-traditional disciplines.

## Attracting New Talent

Identifying gaps in the agricultural scientific workforce and developing strategies for attracting new food and agriculture researchers.

## Retaining Existing Talent

Incentivizing career-long engagement in food and agriculture research.

“As a project leader in the industry sector, there are often days that I use the knowledge gained from my time in the FFAR Fellows Program more than I use the technical skills I acquired in graduate school. From project management, science communication, interpersonal skills and more... being a FFAR Fellow helped me transition from academia to industry and continues to shape my career as a research scientist.”

Dr. Sara Tondini, 2020-2023 FFAR Fellow  
Research Scientist – Ruminant, ADM



“The FFAR New Innovator Award was a game-changer for my career and for our lab. As our first major grant, it gave me the momentum to build a thriving research program – recruiting talented students and postdocs, generating invaluable data and paving the way for quality publications and multimillion-dollar funding. I am profoundly grateful for their belief in early-career researchers like me.”

Dr. Kiran Gadhave, 2023 New Innovator in Food & Agriculture Research – Assistant Professor of Entomology, Texas A&M University





# Safeguarding the Future of Mid-Atlantic Viticulture

The mid-Atlantic wine industry has experienced large growth in recent years. Wine production in Maryland, Virginia and North Carolina combined represents an estimated \$16 billion industry.



While many wine enthusiasts know that most wine grapes are grown in dry climates like the Mediterranean and the U.S. West Coast, the mid-Atlantic region is also suitable for wine grape production. However, the mid-Atlantic's hot, humid summers leave grapes susceptible to fungal diseases like ripe rot. This disease causes the grapes

to rot on the vine before they are ready for harvest.

## Humid Climate Vineyards Vulnerable

Recognizing this vulnerability, University of Maryland researchers Dr. Mengjun Hu and Dr. Scott Cosseboom conducted research to evaluate conditions in which ripe rot infects grapes, fungicides that effectively combat the pathogen and the optimal timing for applying these fungicides. This research was critical for mid-Atlantic vineyards since ripe rot does not impact drier wine grape growing regions, where research investments are generally focused, leaving growers unsure what causes ripe rot and how to effectively prevent it.

Drs. Hu and Cosseboom successfully identified the pathogen responsible for ripe rot and developed an improved ripe rot management practice, as well as a public disease risk model, GrapeCast, which accounts for weather patterns, leaf wetness and crop infection susceptibility to estimate the number and timing of fungicide sprays for grapevine ripe rot. Extension networks and influential vineyard consultants have widely promoted these tools, which have been adopted on thousands of acres in the mid-Atlantic. VineSmith, a widely used decision

making tool for wine grape growers east of the Rocky Mountains, also incorporated the improved fungicide guides in its WineGrape Spray Guide.

## Tools to Manage Ripe Rot

Grape growers can now manage ripe rot in the mid-Atlantic region thanks to these tools. Growers have reduced their annual losses by an estimated \$7 million over four growing seasons, and additionally, with targeted fungicide use, growers are using less fungicides, lowering the chance of fungi developing resistance to these control measures. The value of these practices doesn't stop with grapes. A New York apple orchard is using the risk model developed by this research to inform timing of fungicide applications.



**“In my opinion, Mengjun’s work has made Cabernet Sauvignon viable again in the Mid-Atlantic. Cabernet Sauvignon is one of the most susceptible grapes to ripe rot, and before this work, I had clients who lost entire seasons because they didn’t know what to spray for or when to spray.”**

Lucie Morton, viticulturist and leading consultant to the North American Wine Industry

This research protects a young, thriving industry now and into the future. Savings for growers have reached 18 times the investment made into the research and are projected to reach over \$44 million by 2035. Furthermore, it also created an opportunity for early-career scientists to focus on this vital research without the pressure of securing additional external funding. The future of mid-Atlantic wine grape production is more secure with dedicated scientists like Drs. Hu and Cosseboom in the workforce.











# Building a Robust, Efficient Foundation

The Agriculture Improvement Act of 2018 required FFAR to investigate paths toward greater self-sufficiency. Our [2019 Strategic and Sustainability Plan](#) (Strategic Plan), developed by the Boston Consulting Group, identified four paths to further leverage public funds and diversify funding models:

1. Strengthen FFAR's core model: increase leverage and impact of congressional funding.
2. Build new funding models: scale FFAR's model for even greater impact and establish a strong, diversified funding base.
3. Continue to benefit from congressional funding: maintain FFAR's credibility and independence and provide even greater leverage of taxpayer dollars.
4. Invest in key enablers: build new capabilities, models and capacity to execute on strengthening the core.

In addition to these four paths, FFAR strategically invests the funding it receives, and as of December 2024, had generated over \$80 million in interest and investment gains, an amount significantly greater than FFAR's operational costs by that date.

FFAR has more than doubled Congress's investment even as U.S. public food and agriculture research investment has declined by over a third in the last 25 years. By the end of 2024, FFAR had mobilized over \$775 million of shared investment in food and agriculture research, leveraging \$1.40 for every \$1 of Farm Bill funding invested in research

FFAR's model requires public investment to leverage private-sector dollars. Over 80% of our stakeholders — from our private-sector partners to U.S. universities — believe Congressional funding is a critical component of the FFAR model. Without additional Congressional funding, the private sector is not likely to invest in the public agriculture research and solutions FFAR is best known for among industry leaders and U.S. farmers.

In 2024, FFAR hired a new vice president of partnerships & development to develop a five-year strategy that will further increase the Foundation's match ratio, identify additional funding sources, create new funding models and attract new partners.

FFAR is also undertaking several program evaluations with third-party experts to provide independent assessment into the real-world impacts and value of FFAR-funded research. The knowledge gained from these evaluations will help FFAR quantify our benefits to stakeholders and identify new approaches and funding models. Details of this work can be found in the ["Monitoring, Evaluating & Learning" section](#) of this report.







# 2024 Financials

## ASSETS

Cash and equivalents	\$ 28,511,336
Certificate of deposit	-
Contributions receivable	17,292,538
Awardee match receivable, net of discount	101,988,760
Federal appropriation receivable	-
Investments	186,537,464
Other assets	86,558
Right-of-use assets - operating, net	223,346
Total assets	<u>\$ 334,640,002</u>

## LIABILITIES & NET ASSETS

Liabilities	
Accounts payable and accrued expenses	\$ 1,038,257
Grants payable, net of discount	190,152,511
Deferred revenue	9,374,915
Deferred rent	462,596
Total liabilities	<u>201,028,279</u>
Net assets	133,611,723
Total liabilities and net assets	<u>\$ 334,640,002</u>

## STATEMENT OF ACTIVITIES

Year Ended December 31, 2024

### REVENUE

Recognition of Federal appropriation	-
Matching award revenue	26,107,274
Investment income, net of fees	21,410,945
Consortia contributions	125,000
Federal grant revenue	423,658
Contributions	153,719
Total revenue	<u>\$ 48,220,596</u>

### EXPENSES

Program Services	
Grants & awards program	\$ 54,960,752
Supporting Services	
General & administrative	4,524,549
Development	1,198,038
Total expenses	<u>\$ 60,683,339</u>

Total change in net assets	<u>(\$12,462,743)</u>
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# Looking Ahead: 2025 Initiatives

## Evaluations

As outlined in the [Monitoring, Evaluation & Learning section of this report](#), FFAR is working with external contractors on various evaluations to continue assessing the impact of our programs, optimizing our approach and ensuring alignment with stakeholder needs. Additionally, as a result of the 2024 ROAR evaluation, FFAR will be restructuring the program to incorporate lessons learned. Throughout 2025, FFAR is evaluating ongoing and concluded research projects and programs to document their impact, including research on poultry productivity and welfare, soil health and food systems. FFAR is also commissioning an evaluation of our long-running competitive research program, Seeding Solutions, and will use evaluation findings to inform program redesign.

## Refined Reporting Process

In 2025, FFAR is updating our reporting system to make grantee reporting more straightforward, reduce the time required to complete reports and provide more targeted questions to align with project objectives and outcomes. Additionally, we will be asking grantees to report on several new quantitative metrics (i.e., FFAR Indicators) that will fully showcase each project's impact and unlock data-driven improvements.

## Pilot Program that Maximizes Impact

FFAR will launch a pilot program in 2025 to support follow-on research by previous awardees of FFAR's New Innovator in Food & Agriculture Research Award or the Seeding Solutions program. This pilot program aims to provide FFAR-funded scientists with an opportunity to build on the most successful research outcomes from the first decade of two signature FFAR funding programs.











**FFAR**

[www.foundationfar.org](http://www.foundationfar.org)