2018 ANNUAL REPORT

Transforming Agriculture's Future

Foundation for Food and Agriculture Research

FFAR

Together We'll Go FFAR

Thank you for your continued support of FFAR as we work in collaboration to advance food and agriculture research.

Visit the FFAR website and connect with us on social media to learn more about funding opportunities, grant updates and the latest news in the food and agriculture industry.

Website: https://foundationfar.org/

Twitter: @FoundationFAR

Facebook: facebook.com/FoundationFAR

LinkedIn: linkedin.com/FoundationFAR

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Letter from the Board Chairman

Dear Friends of the Foundation for Food and Agriculture Research,

With nearly 10 billion people projected to populate our global dinner table by 2050, Congress created the Foundation for Food and Agriculture Research (FFAR) in the 2014 Farm Bill to build public-private partnerships that fund transformational research. This year, Congress confirmed that the FFAR model is working by providing an additional $185 million in the 2018 Farm Bill. This funding ensures that FFAR remains at the forefront of innovative agricultural research by continuing to support research with the potential to profoundly impact food and agriculture systems. We are grateful for Congress' continued support.

As a member of the inaugural Board and now serving as Chair, I have witnessed firsthand the critical role the Foundation plays in supporting innovative research that aids farmers in the United States and around the world. In 2018, FFAR's research addressed agriculture challenges ranging from methane emissions from cattle to computational modeling of food access. This report provides an overview of the groundbreaking work FFAR has accomplished this year.

Some of the research highlights from 2018 include:

- The Realizing Increased Photosynthetic Efficiency (RIPE) project's initial results are staggering:
  - One team's research is using blue-green algae to improve photorespiration in plants and increasing plant growth and yields by 60 percent. This research was published in *Nature Communications*.
  - Another team proved that increasing a protein in the leaves of crops can increase production by nearly 50 percent. Their research was reported in the *Plant Biotechnology Journal*.
- The Foundation developed several scientific programs, including:
  - FFAR's Tipping Points Program, which awarded five grants to explore the complexity of food system interventions and reduce food insecurity in communities nationwide.
  - Accelerating Advances in Animal Welfare that supports research to improve animal lives, food quality, farm-laborer work environments and the relationship between our society and the food we eat.
  - Sustainable American Aquaculture that stimulates innovative research in farmed production of fish and shellfish.

FFAR's research ensures that American farmers continue to be the most productive in the world, driving economic growth and stability. Our work also supports farmers across the globe with a goal to provide every person access to affordable and nutritious food grown on thriving farms.

We welcome your partnership at this unprecedented moment for food and agriculture research.

Sincerely,

Mark E. Keenum, Ph.D.
Chairman and Inaugural Member, FFAR Board of Directors
President, Mississippi State University

Letter from the Executive Director

Dear Friends of the Foundation for Food and Agriculture Research,

We had another great year at FFAR, building strategic partnerships and funding innovation in the food and agriculture sciences. The recognition by the food and agriculture community that our partnerships support groundbreaking research translated into FFAR receiving an additional $185 million in the 2018 Farm Bill. We are extraordinarily grateful for the support of Congress, as we continue to realize their vision of a new way to invest in innovation today to prepare for the food and agriculture challenges of tomorrow.

The Foundation awarded over 50 grants in 2018, totaling more than $32 million in FFAR award funding and related support costs. We collaborated with over 200 industry, philanthropic and nonprofit thought leaders and organizations. These partnerships provided a combined investment of more than $60 million to groundbreaking research that will transform food and agriculture systems. Through individual contributors and matching funds, FFAR is leveraging $1.20 for every federal dollar invested.

I am excited about our accomplishments that you will read about in this report and want to point out that FFAR is evolving as the agriculture ecosystem evolves. We worked with our stakeholders in revising the FFAR Challenge Areas for 2019 which now are:

- Soil Health
- Sustainable Water Management
- Next Generation Crops
- Advanced Animal Systems
- Urban Food Systems
- Health-Agriculture Nexus

Please be sure to read about our incredible inaugural cohort of FFAR Fellows who are receiving training using a new approach to career readiness.

There is still a wide new frontier for science and innovation in agriculture and so much to learn. We are looking forward to the partnerships and amazing research that will take us there in the years to come.

Sally Rockey, Ph. D.
Executive Director

Who We Are

The Foundation for Food and Agriculture Research (FFAR) builds private-public partnerships to fund research that fills knowledge gaps, advances science and provides results directly applicable to the food and agriculture system.

FFAR works with academic, industry, governmental and nonprofit partners to identify pressing food and agriculture issues, where increased investment can propel science into application.

The Foundation was established by the 2014 Farm Bill to bring greater private investment to public food and agriculture research. The 2014 law allocated $200 million to FFAR and required that every federal dollar be matched with a private dollar. FFAR was allocated $185 million in the 2018 Farm Bill with the same matching requirement.

While an independent nonprofit, the Foundation complements and advances the United States Department of Agriculture's (USDA) mission and builds programs that are of mutual interest to USDA, FFAR and the agricultural community at-large.

What We Do

Funding Transformational Research

FFAR worked with more than 200 funding partners in 2018 and awarded over 50 grants, which resulted in a more than $60 million investment in innovative research to transform the food and agriculture industry.

FFAR research grants fit into our initial Challenge Areas, which include:

- Healthy Soils, Thriving Farms
- Protein Challenge
- Food Waste and Loss
- Overcoming Water Scarcity
- Urban Food Systems
- Making My Plate Your Plate
- Forging the Innovation Pathway to Sustainability

FFAR's Vision

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

FFAR's Mission

We build unique partnerships to support innovative science addressing today's food and agriculture challenges.

Stakeholder Engagement is Critical to the FFAR Model

FFAR seeks stakeholder input at all project stages to ensure research results are innovative and transformative. When developing a research program, FFAR seeks input from the agriculture community, the FFAR Board of Directors and the USDA. FFAR uses expert reviewers to evaluate the scientific merit of proposals.

The Foundation brings together farmers, ranchers, scientists, academics, researchers, philanthropists and members of industry and government to identify gaps in research during convening events. Through these convening events, FFAR designs scientific programs that generate results for real-world application.

Fostering the Future: Supporting Food and Agriculture Scientists

FFAR supports the development of scientists working in food and agriculture through three fellowship programs:

- National Academies of Science Prize in Food and Agriculture Sciences
- New Innovator in Food and Agriculture Research Early Career Award
- FFAR Fellows Program

These programs invest in scientific expertise today that will be critical to the food and agriculture industry in the future.

How We Work: Developing Research Programs

FFAR builds scientific programs to advance agriculture research on specific topics and funds innovative projects through those programs.

1: Concept Development

Ideas for research programs stem from various sources:

- USDA
- Commodity and farm groups
- Research organizations and conferences
- Convening events
- FFAR stakeholders
- FFAR staff
- FFAR Board of Directors
- FFAR Advisory Councils

FFAR's Scientific Program Directors ensure alignment with organizational priorities. The respective Scientific Program Director consults with the USDA to ensure the program does not duplicate efforts. Program ideas are also evaluated based on various other factors, including:

- Mission alignment
- Innovation
- Potential farmer impact
- Actionable outcomes
- Research needs
- Interest from the private sector

FFAR's Executive Director reviews program concepts and either rejects or accepts the concept.

2: Concept Clearance

Each FFAR Challenge Area has an Advisory Council, comprised of external scientists, agriculture practitioners and stakeholders. The Advisory Council reviews and determines whether the prospective program concept aligns with the relevant FFAR Challenge Area and will yield actionable results that solve critical food and agriculture challenges.

A program may be further refined through conversations and input occurring at multiple venues, including convening events.

3: Program Approval

The program is presented to FFAR's Scientific Program Committee, a subset of Board members, for final approval. Scientific programs may be rejected, invited to revise and resubmit, or approved. If approved, a program concept becomes a FFAR program. Once a program is approved FFAR staff announce the program publicly.

How We Work: Funding Research

Once the research programs are established, FFAR announces the program publicly and funds innovative projects through those programs.

Application Notification and Submission

Applicants can view and apply for funding opportunities within specific research programs on the FFAR website. The Foundation website includes information about each opportunity, including eligibility conditions, application procedures, research requirements, review criteria and the timeline. All research applications must be submitted through the Foundation's online system.

Application Review

All submitted proposals undergo a rigorous review process including reviews by External Peer Reviewers and FFAR's Advisory Councils.

External Peer Review

Applications are evaluated by an independent External Peer Review panel comprised of scientific experts in the respective topic area. Peer Reviewers judge proposals based on select criteria that may include:

- Scientific or technical merit
- Potential impact and relevance
- Project strategy and feasibility
- Innovation

Advisory Council Review

Advisory Councils are comprised of individuals with significant industry or scientific expertise in each of FFAR's Challenge Areas. Advisory Councils consider applications based on:

- Alignment with FFAR's priorities
- Potential impact and relevance
- Merit across topic area

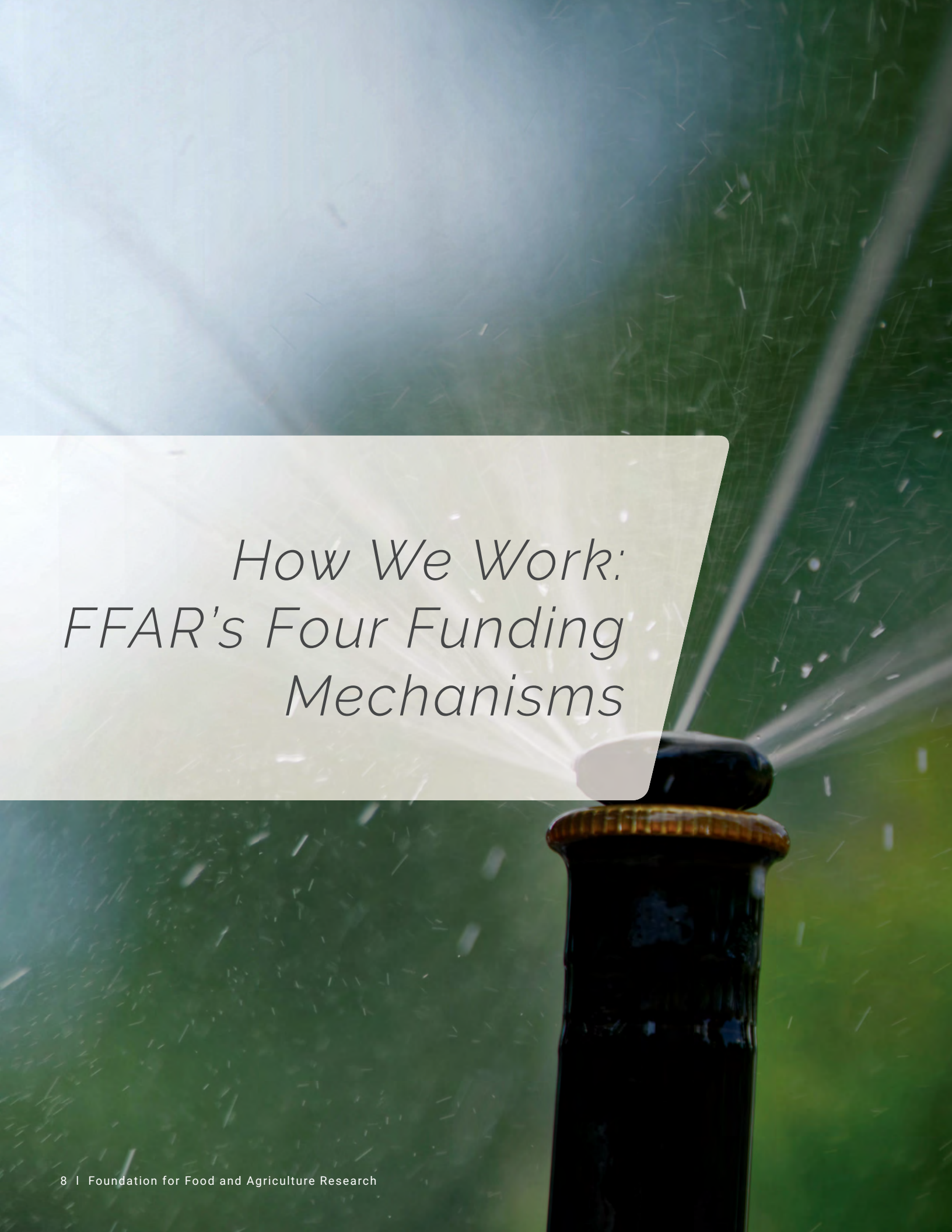
FFAR's Scientific Program Director compiles the results from both the External Peer Review and Advisory Council Review and presents recommendations to FFAR's Executive Director.

Executive Director Approval

FFAR's Executive Director reviews the recommendations and determines final project approval.

Projects are Awarded

Once a project agreement is finalized with the grantee and matching funders, FFAR publicly announces the award. FFAR requires that research teams make their data accessible to the public.

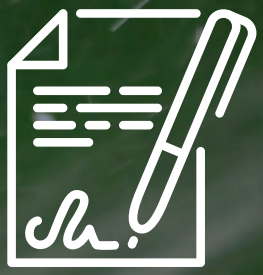


How We Work: FFAR's Four Funding Mechanisms

FFAR provides funding for individual research projects in four ways.

The FFAR grants awarded in 2018 include:

REQUESTS FOR APPLICATION (RFA)



43 GRANTS

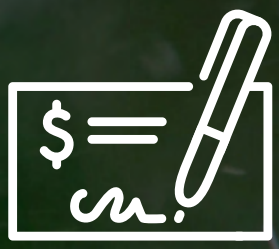
FFAR issues a Request for Application (RFA) to solicit ideas from the broadest group of researchers. Some of FFAR's programs issue RFAs annually and others are a one-time opportunity. The highest quality proposals in terms of technical merit and impact are selected for funding through a vigorous scientific review process.

PRIZES

3 PRIZES

FFAR offers prize competitions to inspire excellence in food and agriculture science or to solve an imminent problem. Prizes are awarded to individuals or organizations who meet the prize criteria and solve the food and agriculture challenge.

DIRECT FUNDS



6 GRANTS

When FFAR knows of a specific individual or organization that is well-suited to conduct the necessary research, a research proposal may be directly solicited from that organization. The proposal is subject to the same rigorous scientific review process and matching funding requirement as other proposals.

CONSORTIA

3 CONSORTIA

Food and agriculture research can be financially risky. FFAR establishes precompetitive consortia to address common problems recognized across the industry, where solutions are beneficial to all. Consortia participants jointly determine research priorities, pool resources and knowledge, and share research results, which also become public.

Research Grants Awarded in 2018

THE FOLLOWING IS AN OVERVIEW OF THE MORE THAN 50 GRANTS FFAR AWARDED IN 2018

HEALTHY SOILS, THRIVING FARMS CHALLENGE AREA

FFAR's Healthy Soil, Thriving Farms Challenge Area aims to increase soil health by building knowledge, fueling innovation and enabling adoption of best practices. FFAR research produces data-driven, innovative results that help farmers make productive and sustainable decisions to conserve and improve soil health, while supporting thriving farms.

Prairie Strips for Healthy Soils and Thriving Farms

Midwestern farms produce a quarter of the world's corn and soybeans, yet this bounty drains nutrients from the soil, reducing future yields and undermining profitability. Iowa State University's research is identifying integration practices that provide continuous living cover on corn and soybean cropland to restore soil health.

Grantee: Iowa State University of Science and Technology
Principal Investigator: Richard Cruse
Matching Funders: Iowa State University, Roeslein Alternative Energy, Iowa Agriculture Water Alliance, Walton Family Foundation

FFAR Award: $746,205 Total Grant: $1,492,409

Advanced Harvest Techniques Facilitate Food Safe Soil Health Practices in Almond Orchards

Almonds typically dry out on the orchard floor before being harvested. This practice prevents growers from using manure, compost or other materials that could improve the soil but could also contaminate the nuts. The University of California, Davis is researching resilient almond harvesting practices that improve soil health in almond orchards.

Grantee: University of California, Davis
Principal Investigator: Patrick Brown
Matching Funders: Almond Board of California, Ples Due Family Farms, Mullerberry Farms, Bays Ranch Inc.
FFAR Award: $225,000 Total Grant: $450,000

Assessing & Expanding Soil Health for Production, Economics, & the Environmental Benefits v2

The Soil Health Institute is enhancing the adoption of soil health practices by establishing a definitive soil health evaluation program for national deployment.

Grantee: Soil Health Institute
Principal Investigator: Wayne Honeycutt
Matching Funders: Soil Health Institute, General Mills, Walton Family Foundation, Monsanto Company, Midwest Row Crop Collaborative, Nestle Purina Petcare, The Nature Conservancy, National Corn Growers Association
FFAR Award: $500,000 Total Grant: $1,195,677

The GroundBreaker Prize: Innovating Soil 3.0

FoodShot Global is awarding the GroundBreaker Prize to rising stars working to advance a healthier, sustainable and equitable food system by creating solutions to

improve soil health, grow more nutritious food, increase profitability and protect the environment.

Grantee: FoodShot Global, Inc.
Principal Investigator: Sara Eckhouse
Matching Funder: The Rockefeller Foundation
FFAR Award: $110,000 Total Grant: $535,000

MOU Organic Farming Research Foundation

FFAR is partnering with the Organic Farming Research Foundation to fund soil health projects that reduce environmental impacts and improve soil health.

Grantee: Organic Farming Research Foundation
Principal Investigator: FFAR signed an MOU in 2018 and the grants will be announced in 2019.
Matching Funder: Organic Farming Research Foundation
FFAR Award: $66,000 Total Grant: $132,000

2018 PROTEIN CHALLENGE AREA

The Protein Challenge seeks to enhance the sustainable production of diverse proteins for a growing global population.

Aquaculture Grants

FFAR's Sustainable American Aquaculture program awarded five grants in 2018 to stimulate research in farmed production of fish and shellfish, provide economic opportunities to US farmers and increase the supply of domestically produced, nutritious foods to meet growing consumer demand.

Maine Scallop Aquaculture Initiative

Coastal Enterprises, Inc. is examining a Japanese scallop production technique that is growing scallops faster, with larger meat yields to inform production techniques that can be used to establish a scallop market in Maine.

Grantee: Coastal Enterprises, Inc.
Principal Investigator: Hugh Cowperthwaite
Matching Funder: Coastal Enterprises, Inc.
FFAR Award: $300,000 Total Grant: $600,000

Maximizing the Delivery of Water-Soluble Substances While Minimizing the Impact of the Carrier Particles on Fish Larvae

Oregon State University is studying how to more efficiently deliver nutrients to commercially raised marine fish. The grant aims to improve production of California yellowtail and California halibut, two high-value fish species.

Grantee: Oregon State University
Principal Investigator: Matt Hawkyard
Matching Funders: Oregon State University, Hubbs Sea World Research Institute, Reed Mariculture
FFAR Award: $275,792 Total Grant: $553,072

Development of Environmental Conditioning Practices to Decrease Impacts of Climate Change on Shellfish Aquaculture

The University of Washington is improving Pacific geoduck clam production by altering environmental conditions at key stages of the life cycle and identifying genetic markers associated with optimal traits.

Grantee: University of Washington
Principal Investigator: Steven Roberts
Matching Funders: Jamestown S'Kallam Tribe, University of Washington, Baywater Shellfish Company, University of Rhode Island
FFAR Award: $877,007 Total Grant: $1,754,067

Feasibility Study for an Alaskan Sea Cucumber Aquaculture Facility

The US does not have a commercial-scale production facility for Alaskan Sea Cucumbers, a high-value marine invertebrate. The McDowell Group Inc. is examining the potential for an aquaculture facility to produce Alaskan Sea Cucumbers.

Grantee: McDowell Group, Inc.
Principal Investigator: Robert Koenitzer, Charlotte Whitefield
Matching Funder: Southeast Arkansas Regional Dove Fisheries Association
FFAR Award: $50,000 Total Grant: $100,000

Toward Responsible Pacific Bluefin Tuna Mariculture in the United States: Captive Reproduction, Hatchery Research and Product

Ichthus Unlimited, LLC is cultivating Pacific Bluefin Tuna eggs to grow juvenile fish, which can then mature on tuna farms. Acquiring tuna eggs from hatcheries, rather than the wild, would reduce overfishing and help stabilize the wild population.

Grantee: Ichthus Unlimited, LLC
Principal Investigator: Alejandro Buentello
Matching Funders: Ichthus Unlimited, LLC, Texas A&M, Spanish Institute of Oceanography, Illinois Soybean Foundation, San Diego Port
FFAR Award: $945,735 Total Grant: $2,978,942

Sustainable Livestock Production

In 2018, FFAR awarded grants to improve feed and nutrition efficiency, environmental sustainability, animal well-being and antibiotic stewardship in livestock and poultry.

An Integrated Approach to Improve Whole Herd Pig Survivability

An estimated 30-35 percent of pigs die before reaching the market and mortality rates are increasing. An interdisciplinary team is studying the causes of swine mortality on commercial farms and how to improve pig survivability.

Grantee: National Pork Board
Principal Investigator: Jason Ross
Matching Funder: National Pork Board
FFAR Award: $999,772 Total Grant: $1,999,772

Automated Computer Vision System for Tracking Individual Pig Activity and Locomotion in Nursery/Finisher Group Housing

Technological advances allow livestock producers to capture unprecedented amounts of data on pigs in their care. This grant proposes technology that can continually track individual pigs and log information about their activities for future analysis and selection.

Grantee: National Pork Board
Principal Investigator: Benny Mote
Matching Funder: University of Nebraska
FFAR Award: $49,999 Total Grant: $99,998

Improving Dairy Feed Efficiency, Sustainability and Profitability by Impacting Farmer's Breeding and Culling Decisions

Dairy farmers could significantly reduce their expenses by selecting cows that produce the same or more milk while consuming less feed. Researchers will monitor dairy cows' body temperature, feeding behavior, and locomotion, along with milk spectral data, to predict feed intake and gather data from thousands of cows to allow farmers to select the most efficient cows.

Grantee: Michigan State University
Principal Investigator: Michael Vandehaar
Matching Funder: Council on Dairy Cattle Breeding
FFAR Award: $1,000,000 Total Grant: $1,999,999

Protein-Based Thermotolerance Markers for Sustainable Legume Protein Production

Extreme weather devastates soybean crop yields and nutritional content. USDA researchers are determining how to leverage the natural genetic diversity of plants to increase soybean resiliency in response to climate change.

Grantee: USDA-ARS
Principal Investigator: Anna Locke
Matching Funders: Benson Hill Biosystems, North Carolina Soybean Producers, Golden Leaf Foundation, United Soybean Board, VIB
FFAR Award: $941,689 Total Grant: $1,890,189

Red Seaweed Phase II

During digestion, cattle emit methane, which contributes to climate change. The University of California, Davis is evaluating whether feeding cows red seaweed reduces methane emissions and if the additive impacts milk production and quality.

Grantee: Sustainable Markets Foundation
Principal Investigator: Joan Salwen
Matching Funders: Elm Innovations, Schmidt Family Foundation/ The 11th Hour Project, Community Foundation for Greater Atlanta, Skaaren Trust, Silicon Valley Community Foundation
FFAR Award: $50,000 Total Grant: $100,000

URBAN FOOD SYSTEMS AND MAKING MY PLATE YOUR PLATE CHALLENGE AREAS

The Urban Food Systems and the Making My Plate Your Plate Challenge Areas jointly focus on increasing the production and accessibility of fruits and vegetables. This research further examines system constraints that impede the incorporation of nutritious food into the supply chain.

The Tipping Points Program

FFAR launched the Tipping Points Program in 2018 to explore the complexities of food system interventions, which aim to reduce food insecurity, in five regions nationwide. The program supports projects that identify leverage, or 'tipping,' points in food systems where specific changes will improve overall community health and the economy.

FFAR awarded five Tipping Points Projects:

Environmental and Nutritional Benefits of Food Recovery and Redistribution: A Pilot Assessment in New York's Capital Region

In Albany, New York, researchers are evaluating the components of fresh produce recovery and redistribution.

Grantee: Research Foundation of SUNY-University of Albany
Principal Investigator: Beth Feingold
Matching Funders: Bellwether Collaboratory, Capital Roots, The Food Pantries for the Capital District, John Hopkins Center for a Livable Future, New York State Department of Environmental Conservation, Radix Ecological Sustainability Center, University at Albany Foundation, the University at Albany School of Public Health—State University of New York
FFAR Award: $433,152 Total Grant: $870,998

Evaluating Food Access Strategies in Austin To Improve Healthy Food Consumption and Food Security

In Austin, Texas, the research team is examining whether the Fresh for Less farm stands, mobile markets and corner stores increase residents' access to healthy foods.

Grantee: Sustainable Food Center, Inc.
Principal Investigator: Joy Casnovsky
Matching Funder: Austin Public Health
FFAR Award: $996,560 Total Grant: $2,114,226

Integrating Community and Modeling Efforts to Evaluate Impacts and Tradeoffs of Food System Interventions

In Denver, Colorado, researchers are building a computational model to evaluate the potential for city-based food system policies and initiatives to support similar efforts throughout the state.

Grantee: Colorado State University
Principal Investigator: Becca Jablonski
Matching Funders: Colorado Food Policy Network, Colorado Fruit and Vegetable Association, Colorado Potato Advisory Committee, Colorado Wheat Research Foundation, Colorado State University, City/County of Denver, LiveWell Colorado, Denver Museum of Nature and Science, Denver Urban Gardens, Field to Market, Institute for People, Place, and Possibility, Kaiser Permanente
FFAR Award: $1,000,000 Total Grant: $2,000,718

Modeling the Future of Food in Your Neighborhood

In Cleveland, Ohio, researchers are developing computational modeling tools for community partners to strategically tailor and integrate food system initiatives in neighborhoods both within and outside of Cleveland.

Grantee: Case Western Reserve University—School of Medicine
Principal Investigator: Darcy Freedman
Matching Funders: Albert Einstein College of Medicine, Case Western Reserve University School of Medicine-Center for Health Affairs, City of Cleveland Mayor's Office of Sustainability, Cleveland State University, Greater Cleveland Food Bank, Hunger Network of Greater Cleveland, The Ohio State University (OSU) Extension Cuyahoga County, OSU John Glenn School, OSU SNAP-Ed, Saint Luke's Foundation, The Food Trust, Unify Project, University Hospitals Cleveland Medical Center
FFAR Award: $936,418 Total Grant: $1,904,424

Finding the Proper Levers

In Flint, Michigan, researchers are working to identify leverage points to positively transform the food system.

Grantee: Community Foundation for Greater Flint
Principal Investigator: Steven Gray
Matching Funders: Michigan State University, Michigan Fitness Foundation, Michigan Department of Education, Community Foundation of Greater Flint, C.S. Molt Foundation
FFAR Award: $1,000,002 Total Grant: $2,005,803

FOOD WASTE AND LOSS CHALLENGE AREA

The Food Waste and Loss Challenge Area addresses the social, economic and environmental impacts from food waste and food loss.

Reducing Food Waste by Reshaping Consumer Behavior Using Data-Informed, Dynamic Economic Incentives

Consumers often mistakenly interpret "best-by" labels as an expiration date and prematurely discard food that is safe for consumption. Researchers are developing models that predict milk spoilage and shelf life as well as the effectiveness of interventions that predict when food spoils and how to prevent consumers from disposing of items that are still safe.

Grantee: Cornell University
Principal Investigator: Martin Wiedmann
Matching Funders: Department of Food Science at Cornell University, New York State Dairy Promotion Order, Chobani
FFAR Award: $590,000 Total Grant: $1,564,276

Value-Added and Nutritionally Superior Extruded Foods from Agricultural Waste Streams

Much of fruit and vegetable skins, seeds, cores and stems left behind after food processing becomes a form of agricultural waste known as pomace, which has limited utility and harms the environment. Cornell University is developing a technology to convert this waste into snack foods.

Grantee: University of Cornell
Principal Investigator: Syed Rizvi
Matching Funders: New York Apple Association, Cornell University
FFAR Award: $539,962 Total Grant: $1,080,767

FFAR CONSORTIA

The Crops of the Future Collaborative, launched in 2017, awarded two grants. Additionally, FFAR launched the Irrigation Innovation Consortium in 2018.

New Consortium: Irrigation Innovation Consortium

The Irrigation Innovation Consortium is a joint initiative between private, public and university organizations to address water scarcity.

Grantee: Colorado State University
Principal Investigator: Reagan Waskom
Consortium Participants: Aqua Engineering Inc., Colorado Corn, Colorado State University, Daugherty Water for Food Global Institute at the University of Nebraska (DWFI), Fresno State Center for Irrigation Technology, Irrigation Association (IA), Jain Irrigation, Kansas State Research and Extension - Kansas State University, Lindsay Corporation, Northern Water, Rubicon Water, Senninger Irrigation Inc., Texas A&M AgriLife Research, Valmont
FFAR Award: $5,000,000 Total Grant: $10,000,000

Crops of the Future Collaborative Grants

Crops of the Future Initial Project: Leafy Greens

The initial grant from the Crops of the Future Collaborative aims to protect the three billion-dollar lettuce crop from downy mildew, a pathogen that infects lettuce during production in the field and post-harvest.

Grantee: University of California, Davis
Principal Investigator: Richard Michelmore
Consortium Participants: BASF Vegetable Seeds, Bejo Zaden B.V., Benson Hill Biosytems, Inc., Enza Zaden Research and Development, B.V., Gautier Semences, Keygene, N.V., Progeny Advanced Genetics Inc., Ramiro Arnedo S.A., Rijk Zwaan Zaadteelt en Zaadhandel B.V., Sakata Seed Corporation, Syngenta Crop Protection AG, Takii and Company Ltd., Tanimura & Antle Value Added LLC, Vilmorin S.A.
FFAR Award: $2,500,000 Total Grant: $5,097,530

Crops of the Future Seed Grant Award: Corn Drought Resistance

Drought is a primary limitation to crop production that impacts future food security. The project enhances genetic characterization and prediction of drought response in maize.

Grantee: Board of Regents of the University of Wisconsin System
Principal Investigator: Shawn Kaeppler, Natalia de Leon
Matching Funders: KWS, Syngenta
FFAR Award: $50,000 Total Grant: $100,000

RAPID OUTCOMES FROM AGRICULTURAL RESEARCH (ROAR) PROJECTS

The Rapid Outcomes from Agricultural Research (ROAR) program deploys funds to support research and outreach in response to emerging or unanticipated threats to the nation's food supply or agricultural systems.

Feed the Future Fall Armyworm Tech Prize

Experts estimate that in three years the fall armyworm could cause between $2-$6 billion in losses for maize, an African staple crop. In partnership with U.S. Agency for International Development, FFAR awarded the Feed the Future Fall Armyworm Tech Prize to six winners for digital innovations that help farmers manage the spread of fall armyworm.

Grantee: Land O'Lakes International Development
Principal Investigator: John Ellenberger
Matching Funders: Land O'Lakes International Development
FFAR Award: $100,000 Total Grant: $200,000

Sustainable Control Tactics for Spotted Wing Drosophila in Tart Cherry

Spotted wing drosophila (SWD) is an invasive pest that attacks a wide range of fruits, including blueberries, cherries and raspberries. Researchers are optimizing insecticide programs against SWD, evaluating other control tactics, refining monitoring tools, and developing a real-time reporting system of trapping efforts.

Grantee: Michigan State University
Principal Investigator: Julianna Wilson
Matching Funders: Michigan State University Project GREEN, Michigan State University Ag Bio Research
2017 FFAR Award: $150,000 2017 Grant Amount: $300,000
2018 FFAR Award: $150,001 2018 Grant Amount: $301,268
Total Grant: $601,268

Stopping a New Threat to the Lettuce Industry in Florida: Fusarium Wilt

Fusarium Wilt is a fungus that threatens the 70 million-dollar Floridian lettuce industry. The University of Florida is developing disease management practices and training lettuce growers to better manage cross contamination to reduce the spread of this disease.

Grantee: University of Florida
Principal Investigator: German Sandoya Miranda
Matching Funder: University of Florida
FFAR Award: $67,892 Total Grant: $135,806

Development of a Farmer-Focused Disease Prevention and Preparedness Tool

In 2014, a specific strain of avian influenza, H5N2 HPAI, destroyed nearly 50 million birds, costing the industry more than $3.75 billion. Researchers are developing a nationwide tool to improve outbreak response and help producers mitigate foreign animal diseases on farms.

Grantee: University of Minnesota
Principal Investigator: Carl Cardona
Matching Funder: Veterinary and Biomedical Sciences Primary Fund
FFAR Award: $87,691 Total Grant: $183,206

Ecology and Evolution of Bacterial Leaf Streak of Maize

Colorado State University is investigating bacterial leaf streak, a disease with limited treatment or prevention methods, that is causing yield losses for western corn belt growers. This project was originally awarded in 2017 and provided a supplemental award in 2018.

Grantee: Colorado State University
Principal Investigator: Kirk Broders
Matching Funder: Colorado State University
2017 FFAR Award: $148,479 2017 Grant Amount: $296,978
2018 FFAR Supplement: $75,000 2018 Grant Amount: $150,005
Total Grant: $446,983

POLLINATOR HEALTH FUND

Pollinators sustain ecosystems and contribute more than $24 billion to the US economy annually. A variety of domestic crops rely on pollinators to reproduce; however, declining populations of both wild and managed pollinators threaten crops. FFAR created the Pollinator Health Fund to combat the economic and environmental impacts of declining pollinator populations in the US.

Bioindicators for A Sustainable Future: Dancing Honey Bees Communicate Habitats' Ability to Feed Pollinators

Researchers are examining pollinator behavior in different landscapes to determine where and when supplemental forage is most needed to nourish pollinator populations. The research team is also exploring whether honey bee recruitment behavior, which is how a worker tells her nestmates where she collected food, is a reliable indicator of a viable habitat for native pollinators.

Grantee: Virginia Polytechnic Institute and State University
Principal Investigator: Margaret Couvillon
Matching Funder: Virginia Tech
FFAR Award: $614,067 Total Grant: $1,228,134

A Pipeline for Streamlined Development and Testing of Novel Controls for the Honey Bee Parasitic Mite Varroa Destructor

USDA Agricultural Research Service is convening stakeholders to control varroa mites, which damage honey bee colonies and have become resistant to many commercially available chemical control agents.

Grantee: USDA-Agricultural Research Service
Principal Investigator: Steven Cook
Matching Funders: Michael De Jong, Auburn University, Blue Ridge Honey Co., Geezer Ridge Farm, Project Apis, University of Georgia, Universitat de Valencia, Board of Regents for the University of Nebraska Department of Entomology
FFAR Award: $475,559 Total Grant: $1,138,711

The Impact of Nutrition and Metabolic Capacity on Honeybee Health

Colorado State University researchers are studying the impact of phytochemicals, nutritional diversity and metabolic capacity on honeybee health. This project is developing nutritive plant species mixes for pollinator habitats and dietary supplements to sustain healthy honey bee colonies.

Grantee: Colorado State University
Principal Investigator: Arathi Seshardi
Matching Funders: Deryn Davidson (Boulder County Extension), Greg Butters, Colorado Professional Beekeeping Association, Western Colorado Honey, Bob Todd, Greg Bowdish, Colorado State University
FFAR Award: $488,130 Total Grant: $977,072

Lawns-To-Wildflowers

The University of Central Florida is helping citizens convert parts of their lawns to native wildflowers and collect data on pollinator abundance and diversity using a mobile app.

Grantee: University of Central Florida
Principal Investigator: Barbara Sharanowski
Matching Funders: University of Manitoba, University of Central Florida Board of Trustees
FFAR Award: $338,613 Total Grant: $677,230

Can Commodity Crop Weed Management Practices Enhance Bee Abundance, Diversity, and Health on Agricultural Land?

Scientists are examining the potential for cover cropping practices to enhance pollinator habitats.

Grantee: University of Kentucky Research Foundation
Principal Investigator: Clare Rittschof
Matching Funder: University of Kentucky
FFAR Award: $120,900 Total Grant: $241,800

Pollinator Health Extension and Metrics in the Pacific Northwest

Oregon State University is spearheading a project to develop management practices that address unique agronomic challenges in the Pacific Northwest by implementing crop-specific management practices and measuring their effectiveness.

Grantee: Oregon State University
Principal Investigator: Andony Melathopoulos
Matching Funders: Oregon Department of Agriculture, Central Oregon Seeds, Oregon State Beekeepers Association, GloryBee, Oregon Department of Agriculture (Bee Atlas specific)
FFAR Award: $544,929 Total Grant: $1,091,427

Location, Location, Location

Pennsylvania State University is developing online decision-support tools to help beekeepers, growers, plant producers, conservationists, land managers and gardeners assess the ability of their landscapes to support healthy wild and managed bee populations, and obtain recommendations for improving these landscapes.

Grantee: Pennsylvania State University
Principal Investigator: Christina Grozinger
Matching Funders: Pennsylvania State University, University of California (UC), Davis Department of Entomology, Almond Board of California, Hedgerow Farms, UC Davis Student Research Farm, UC Davis Saratoga Research Endowment, IF LLC, California Department of Pesticide Regulation, Sola Bee Farms, Henry's Bullfrog Bees, Steve Godlin, Regents of the University of Minnesota, Dickinson College
FFAR Award: $1,177,137 Total Grant: $2,404,188

The Queen Exposome and Its Influence on Downstream Colony Disease Response

North Carolina State University researchers are studying the effects of pesticide exposure on disease prevalence and reproductive potential. The project is also examining the queen's effect on the bee colony's downstream disease response.

Grantee: North Carolina State University
Principal Investigator: David Tarpy
Matching Funder: North Carolina State University
FFAR Award: $216,610 Total Grant: $433,220

Evaluation of Best Management Practices for Bumble Bee and Monarch Habitat

The University of Missouri Division of Plant Sciences is developing best management practices for seed planting to improve bumble bee and monarch habitats.

Grantee: University of Missouri
Principal Investigator: Deborah Finke
Matching Funder: Missouri Department of Conservation
FFAR Award: $353,044 Total Grant: $717,612

Neglected Honey Bee Interactions: Neonicotinoids, Varroa Destructor, and Best Management

Auburn University is investigating the interactions between pesticides and Varroa mites, two causes of honey bee decline. The project is using honey bees' multiple partner mating behavior to increase intra-colony diversity and improve resistance to pesticides.

Grantee: Auburn University
Principal Investigator: Geoffrey Williams
Matching Funders: Auburn University, Swiss National Science Foundation, University of Georgia, California State Beekeepers' Association
FFAR Award: $282,709 Total Grant: $615,351

Effects of Multiple Stressors on Pollinator Health in the Southern Plains

Oklahoma State University is evaluating floral choice and quality for managed honey bee colonies and native bee populations in grassland, pastureland, rangeland, wheat and canola fields.

Grantee: Oklahoma State University
Principal Investigator: Kristen Baum
Matching Funders: Oklahoma State University, Syngenta Crop Protection LLC
FFAR Award: $233,708 Total Grant: $467,416

The Effect of Farm Management and Floral Foraging Traits on Exposure of Crop Pollinators to The Multiple Interacting Stressors of Pesticides, Parasites and Inadequate Nutrition

The University of California, Riverside is examining how management practices in California almond orchards affect bee nutrition, pesticide exposure and parasites.

Grantee: University of California, Riverside
Principal Investigator: Lauren Ponisio
Matching Funders: Hillary Sardinas, Ponisio and Woodard Start-up Funds, University of California (UC) Riverside College of Natural and Agricultural Sciences, UC Riverside Department of Entomology, UC Riverside Research and Economic Development Office
FFAR Award: $490,356 Total Grant: $980,712

Impact of Prairie on Reducing Interacting Stressors on Pollinator Health

Iowa State University is studying bee and monarch butterfly populations to assess whether prairie strips in crop fields impact honey bee health and native pollinator abundance and diversity.

Grantee: Iowa State University
Principal Investigator: Lisa Schulte Moore
Matching Funders: Bayer CropScience LP, DuPont Pioneer, Iowa State University Foundation, Syngenta LLC, Syngenta Crop Protection Inc., University of Illinois at Urbana-Champaign, Iowa State University
FFAR Award: $503,028 Total Grant: $1,006,343

Invasive Weeds, Fire, and Livestock Grazing

Oregon State University is examining how livestock grazing, invasive species and fires used to control those invasions influence native bee health.

Grantee: Oregon State University
Principal Investigator: Sandra DeBano
Matching Funders: Oregon State University, The Nature Conservancy
FFAR Award: $321,127 Total Grant: $643,447

Developing Public School Curricula and Training High School Students and Teachers as Ambassadors for Pollinator Protection

Purdue University's Entomology Department is developing a public-school curriculum that uses digital badges to encourage students to create community-driven pollinator protection movements.

Grantee: Purdue University
Principal Investigator: Timothy Gibb
Matching Funder: Purdue University
FFAR Award: $297,499 Total Grant: $594,998

Fostering the Future

Fostering the Future programs and fellowships support the next generation of scientists in the food and agriculture industry. In 2018, FFAR awarded nine New Innovators in Food and Agriculture Research Awards, named a National Academy of Sciences Prize in Food and Agriculture Sciences winner and selected the first cohort of FFAR Fellows.

2018 NEW INNOVATORS IN FOOD AND AGRICULTURE RESEARCH AWARDEES

The New Innovator in Food and Agriculture Research Award provides the early investment needed to launch young faculty members into successful scientific careers in food and agriculture. Investing in faculty members within the first three years of their careers allows them to pursue innovative and transformational ideas uninhibited by the pressure to identify funding.

The 2018 New Innovators in Food and Agriculture Research Awardees include:

Plant-Soil-Water Nexus

Dr. Ashworth is leveraging an innovative digital soil mapping process to provide first-ever soil maps and interpretations on Native America tribal lands to promote water and nutrient-smart agriculture.

Grantee: USDA- Agricultural Research Service
Principal Investigator: Amanda Ashworth
Matching Funders: Indigenous Food & Agriculture Initiative, University of Arkansas Division of Agriculture
FFAR Award: $299,607 Total Grant: $599,215

Innovations in the Food Supply Chain to Reduce Food Waste

Dr. Morey is reducing food waste in the food supply chain by develop "Functional Ice" for storage and transportation of raw poultry and seafood.

Grantee: Auburn University
Principal Investigator: Amit Morey
Matching Funder: Auburn University
FFAR Award: $188,260 Total Grant: $377,114

A Coupled Natural-Human System Approach to Solving Locust Plagues

Dr. Cease is exploring connections between land-use practices and locust outbreaks, while identifying and addressing barriers to sustainable locust management.

Grantee: Arizona Board of Regents for and on behalf of Arizona State University
Principal Investigator: Arianne Cease
Matching Funder: ASU-Global Institute of Sustainability
FFAR Award: $298,835 Total Grant: $607,729

Harnessing Endophytes to Improve Crop Efficiency and Production

Dr. Wallace is studying how crops are affected by the microbes that live inside them, and how the environment impacts this relationship. His work aims to understand how microbes affect crop production and how to harness them to improve agriculture.

Grantee: University of Georgia Research Foundation Inc.
Principal Investigator: Jason Wallace
Matching Funders: University of Georgia Department of Agriculture and Environmental Science, University of Georgia Department of Crop Soil Science, University of Georgia Institute of Plant Breeding
FFAR Award: $292,230 Total Grant: $584,461

Towards Production of Residue-Free Healthy Fruit Crops

Dr. Khot is developing and evaluating alternative pest management technologies that aid conventional and organic growers in reducing their reliance on broad spectrum pesticides, which result in residues on foods and in environmental contamination.

Grantee: Washington State University (WSU)
Principal Investigator: Lav Khot
Matching Funder: WSU-Center for Precision and Automated Agricultural Systems, WSU- College of Agricultural, Human and Natural Resource Sciences (CAHNRS), WSU-CAHNRS Biological Systems Engineering Department, WSU Graduate School
FFAR Award: $300,000 Total Grant: $600,000

Direct Linkage of Dietary Components with Metabolizers in the Microbiota

Dr. Kleiner is linking dietary components to the microbes in the intestinal tract of humans and animals that consume them to design diets that foster health-promoting microbes and deprive disease-causing microbes of their food source.

Grantee: North Carolina State University
Principal Investigator: Manuel Kleiner
Matching Funder: North Carolina State University
FFAR Award: $299,535 Total Grant: $599,070

Optimizing Water Use in Agriculture by Stacking Conservation Practices

Dr. Yost is identifying the combined effectiveness of several methods of water optimization in agriculture, including more efficient water application and management and advanced crop genetics.

Grantee: Utah State University
Principal Investigator: Matt Yost
Matching Funder: USU CAES, Central Utah Water Conservancy District, E&I Conservation District, Unitah Conservation District, North Cache Conservation District, Senninger Irrigation, Central Iron County Water Conservancy District, USU RGS
FFAR Award: $300,000 Total Grant: $600,001

Effects of Asymptomatic Listeriosis on Dairy Cattle Fecal Microbiota

Dr. Huynh is examining the interactions of *Listeria monocytogenes* with cattle gastrointestinal tract microbiota. Although clinical listeriosis is rare, *L. monocytogenes* is frequently shed by dairy cattle, reflecting a high prevalence of infection and carriage.

Grantee: University of Wisconsin-Madison
Principal Investigator: Tu Anh Huynh
Matching Funder: UW Madison Food Recovery
FFAR Award: $102,366 Total Grant: $207,365

Developing CRISPR-Cpf1 Genome Editing Technologies for Crop Improvement

Dr. Qi is developing CRISPR-Cas12a based plant genome editing systems with broadened targeting range and improved editing activity and specificity. If successful, these tools could accelerate plant breeding for generating high-productivity crops with stress resistance to climate change.

Grantee: University of Maryland-College Park
Principal Investigator: Yipling Qi
Matching Funder: Syngenta
FFAR Award: $282,843 Total Grant: $565,686

NATIONAL ACADEMY OF SCIENCE (NAS) PRIZE IN FOOD AND AGRICULTURE SCIENCES

The National Academies of Science (NAS) Prize in Food and Agriculture Sciences was established by FFAR, in partnership with the Bill & Melinda Gates Foundation (BMGF), to recognize extraordinary contribution to agriculture and the biological understanding of species important to food and agriculture production. FFAR and BMGF established the NAS Prize in Food and Agriculture Sciences to elevate food and agriculture research and highlight the critical need for scientists working toward more productive, sustainable agriculture.

2018 WINNER: DR. RODOLPHE BARRANGOU

Dr. Rodolphe Barrangou, an Associate Professor of Food Science and the Todd R. Klaenhammer Distinguished Scholar in Probiotics Research at North Carolina State University, is the 2018 recipient of the NAS Prize in Food and Agriculture Sciences.

Dr. Barrangou's groundbreaking research established CRISPR as the adaptive immune system of bacteria, a discovery which promoted the practical use of CRISPR-Cas systems for genome editing. The work has tremendous worldwide applications in food and agriculture, including virus resistance in the widely used yogurt starter culture, *Streptococcus thermophilus*, and the potential for translational genome editing in other microbes, crops and livestock.

FFAR FELLOWS PROGRAM

The FFAR Fellows Program provides professional development and training to selected agricultural sciences students. The Fellowship prepares students to be future leaders in the food and agriculture industry. Students pursue research projects related to FFAR's Challenge Areas and strategic initiatives. In addition to academic advisors, the students are matched with industry mentors who provide additional career guidance. Throughout the Fellowship, the FFAR Fellows engage with their peers in a series of professional development opportunities both virtually and annually at a one-week residential session.

The 2018 FFAR Fellows Cohort includes:

Abigail Barker
Doctoral Candidate, Colorado State University, Bioagricultural Sciences & Pest Management Department

Barker aims to understand herbicide resistance in weeds and develop recommendations for sustainable herbicide management practices. Barker's industry sponsor is Valent U.S.A. LLC.

Lindsey Becker
Doctoral Candidate, North Carolina State University, Plant Pathology Department

Becker is examining the beneficial relationship between *Mortierella elongate*, a fungus that breaks down organic matter in soil, and tomato plants. Becker's industry sponsor is Novozymes.

Francesco Cappai
Doctoral Candidate, University of Florida, UF/IFAS College of Agricultural and Life Sciences, Plant Molecular and Cellular Biology Program

Cappai is using new breeding techniques to develop blueberries that are machine harvestable, which would lower production costs. Cappai's industry sponsor is Gourmet Blueberries Ltd.

Zach Dashner
Doctoral Candidate, Pennsylvania State University, College of Agricultural Sciences Department of Plant Science

Dashner aims to understand iron uptake from soil in cacao plants and improve farmers' ability to grow crops in iron-deficient environments. Dashner's industry sponsor is Mars Wrigley Confectionery.

Alison Deviney
Doctoral Candidate, North Carolina State University, Biological and Agricultural Engineering Department

Deviney aims to improve manure management in livestock operations through nitrogen recovery and understand barriers to adoption of sustainable technologies. Deviney's industry sponsor is Waste 2 Green, LLC.

Jeremie Favre
Doctoral Candidate, University of Wisconsin-Madison, Agronomy Department

Favre is exploring best management practices to maintain seed yield of Kernza, the grain of Intermediate Wheatgrass. Favre's industry sponsor is Perennial Agriculture Project, in conjunction with the Malone Family Land Preservation Foundation and The Land Institute.

Shelby Hoglund
Doctoral Candidate, University of Arizona, Department of Soil, Water, and Environmental Science

Hoglund aims to quantify the benefits of using green waste recycling to improve soil health, conserve irrigation water, and improve agricultural productivity. Hoglund's industry sponsor is TAB AG Group.

Annie Krueger
Doctoral Candidate, University of Nebraska-Lincoln, Department of Entomology

Krueger is developing agricultural land management practices to improve the health of Monarch butterfly populations. Krueger's industry sponsor is Monsanto Company.

Morgan Mathison
Doctoral Candidate, Michigan State

University, Department of Community Sustainability

Mathison is exploring how Adaptive Multi-paddock (AMP) grazing influences the health and wellbeing of farmers who adopt the practice. Mathison's industry sponsor is McDonald's USA.

Maci Mueller
Doctoral Candidate, University of California, Davis, Department of Animal Science

Mueller aims to improve the distribution of elite cattle genetics through new breeding technologies. Mueller's industry sponsor is Recombinetics.

Mary Ortiz Castro
Doctoral Candidate, Colorado State University, Bioagricultural Sciences and Pest Management Department

Ortiz Castro seeks solutions to combat bacterial leaf streak in corn by understanding the ecology of the disease and creating an integrated management program. Ortiz Castro's industry sponsor is the Colorado Corn Administrative Committee.

Camilo Parada Rojas
Doctoral Candidate, North Carolina State University, Plant Pathology Department

Parada Rojas is developing sweet potato varieties that are resistant to black rot, a devastating disease threatening producing across the U.S. Parada Rojas' industry sponsor is The North Carolina SweetPotato Commission.

Suneru Perera
Doctoral Candidate, University of Saskatchewan, College of Agriculture and Bioresources

Perera is exploring processing techniques to expand the uses of canary seed, a cereal grain that was approved for human consumption by the USDA and Health Canada in 2016. Perera's industry sponsor is POS Bio-Sciences in Saskatoon, Canada.

Ananda Portela Fontoura
Doctoral Candidate, Cornell University, College of Agriculture and Life Sciences, Department of Animal Science

Fontoura is defining nutritional therapies to improve the metabolic health and productivity of dairy cows at the onset of lactation and when exposed to heat stress. Fontoura's industry sponsor is Vetagro.

Lovepreet Singh
Doctoral Candidate, University of Maryland, Plant Science and Landscape Architecture Department

Singh is examining the mechanism behind Fusarium Head Blight resistance in wheat and develop management practices to help mitigate this disease. Singh's industry sponsor is KeyGene.

Jaimie Strickland
Doctoral Candidate, Michigan State University, Department of Large Animal Clinical Sciences

Strickland explores how micronutrients, like vitamin A and E, can improve health of dairy cattle. Strickland's industry sponsor is Elanco.

Jiayang (Kevin) Xie
Doctoral Candidate, University of Illinois at Urbana-Champaign, Department of Crop Sciences

Xie is increasing drought tolerance in plants through methods that do not decrease productivity. Xie's industry sponsor is Monsanto Company.

2018 CONVENING EVENTS

Ecosystem Services Market Program Convening Event

On September 19, 2018, FFAR and the Noble Research Institute hosted the Assessing Research and Technology Gaps in an Ecosystem Services Market Program Convening Event. During the event, participants discussed research questions and technology requirements needed to develop a voluntary farmer/rancher free-market-based ecosystem services trading platform. Participants also evaluated opportunities to translate the economic and ecological benefits of this system to agricultural producers.

FFAR 2018 Public Conversation

Consistent with the law, FFAR's Public Conversation is an opportunity for the public and members of the food and agriculture community to hear from the Foundation's leadership and offer input on the Foundation's strategic research priorities. FFAR held the annual Public Conversation on October 12, 2018, at the International Food Policy Research Institute in Washington, D.C.

Attendees heard from Board Chairman Mark Keenum, Ph.D. and Executive Director Sally Rockey, Ph.D. on the Foundation's recent accomplishments and upcoming work. The presentations included an overview of the FFAR model, research results to date and changes to the Challenge Areas for 2019. Fifty members of the community attended the 2018 Public Conversation and seven individuals delivered remarks.

Harvest for Health Inter-Agency Meeting

On October 30, 2018, FFAR hosted an inter-agency meeting to explore the role of agriculture in improving and supporting human health and wellbeing. The meeting's objectives included: identifying research gaps at the intersection of agriculture, nutrition and health, with a high interest in connecting production agriculture to health outcomes; and determining areas of strategic investments that will leverage FFAR funding and future investments made by federal agencies that harmonize joint efforts in ensuring a healthy future for all.

Soil Health Human Health Conference

This national conference on soil health-human health connections was held October 16-17, 2018, in Silver Spring, Maryland and brought together 180 attendees. The conference provided an opportunity to:

- Hear from scientific leaders about potential connections between agricultural, biological, social, earth and human health sciences;
- Provide an interdisciplinary discussion forum;
- Identify research gaps;
- Create opportunities to establish interdisciplinary teams to address the research gaps; and
- Propose funding mechanisms to fund scientific research that benefits agricultural systems, the environment and the public.

FFAR FINANCIALS

ASSETS	
Cash and cash equivalents	$13,781,870
Certificate of deposit	200,224
Contributions receivable	357,113
Award match receivable	73,904,943
Investments	166,148,846
Security deposits	101,103
	$254,494,599
LIABILITIES AND NET ASSETS	
Liabilities	
Accounts payable	$37,318
Grants payable, net of discount	130,103,097
Accrued expenses	201,851
Conditional grant	112,539,370
Conditional grant—General Operating Support Fund	5,056,061
Deferred rent	569,853
	$248,507,550
Total net assets	$5,987,049
Total liabilities and net assets	**$254,494,599**

STATEMENT OF ACTIVITIES

Year Ended December 31, 2018

REVENUE	
Recognition of deferred appropriation	$33,792,885
Matching award revenue, net	$34,722,438
Investment income, net of fees	$296,414
Consortia contributions	$589,000
Contributions	$13,812
Event revenues	$214,524
Other revenue	$18,000
Total revenue	**$69,647,073**
EXPENSES	
Program	
Grants and awards program	$66,752,646
Supporting services	
General and administrative	$1,754,684
Development	$525,478
Total expense	**$69,032,808**
CHANGE IN NET ASSETS	**$614,265**

2018 SUPPORTERS

Thank you to all the organizations who generously contributed to our mission to advance food and agriculture science. FFAR is grateful for the support of the matching funders for each grant awarded in 2018, and to the following organizations and individuals who contributed to our projects, programs and events:

Visionary Level - $1M+

Open Philanthropy Project

Investor Level - Up to $499,999

Syngenta Crop Protection LLC

Champion Level - Up to $249,999

Bayer Nunhems USA Inc.
General Mills Foundation

Enthusiast Level - Up to $99,999

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The Chairman of each Council is bolded and italicized.

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Maha Tahiri, Ph.D.
General Mills
Laurian Unnevehr, Ph.D.
University of Illinois (ret.)

ON THE HORIZON

Foster Our Future

On February 5, 2020, FFAR will host its second annual Foster Our Future event. The inaugural Foster Our Future event was held in February 2019 in Washington D.C. This exciting food and agriculture event featured:

- Game-changing research technology and innovation demonstrations
- Examples of scientific breakthroughs brought to life
- Celebrations of the impact food and agriculture has had on consumers and producers
- The newest research talent
- Highlights of the importance of continued research investment

The event included interactive exhibits and inspiring discussions. Participants saw, heard and interacted with displays highlighting research FFAR supports and other scientific breakthroughs.

SMART Broiler Research Initiative

FFAR and McDonald's are cofounding a research initiative offering $4 million for research supporting the development and commercialization of automated monitoring tools that quantitatively assess key animal welfare indicators in broiler chickens. This initiative funds the development of Sensors, Monitoring, Analysis and Reporting Technologies (SMART), and is currently accepting proposals.

Egg-Tech Prize: New Technologies for In Ovo Sex Determination

FFAR is partnering with the Open Philanthropy Project on a $6 million prize to revolutionize global egg production by stimulating the development of technologies that can accurately and rapidly determine a chick's sex as early as possible in the egg production process. Such technology would end unnecessary incubation and the practice of male chick culling on the day chicks hatch.

Foundation for Food and Agriculture Research
401 9th St. NW, Suite 630
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