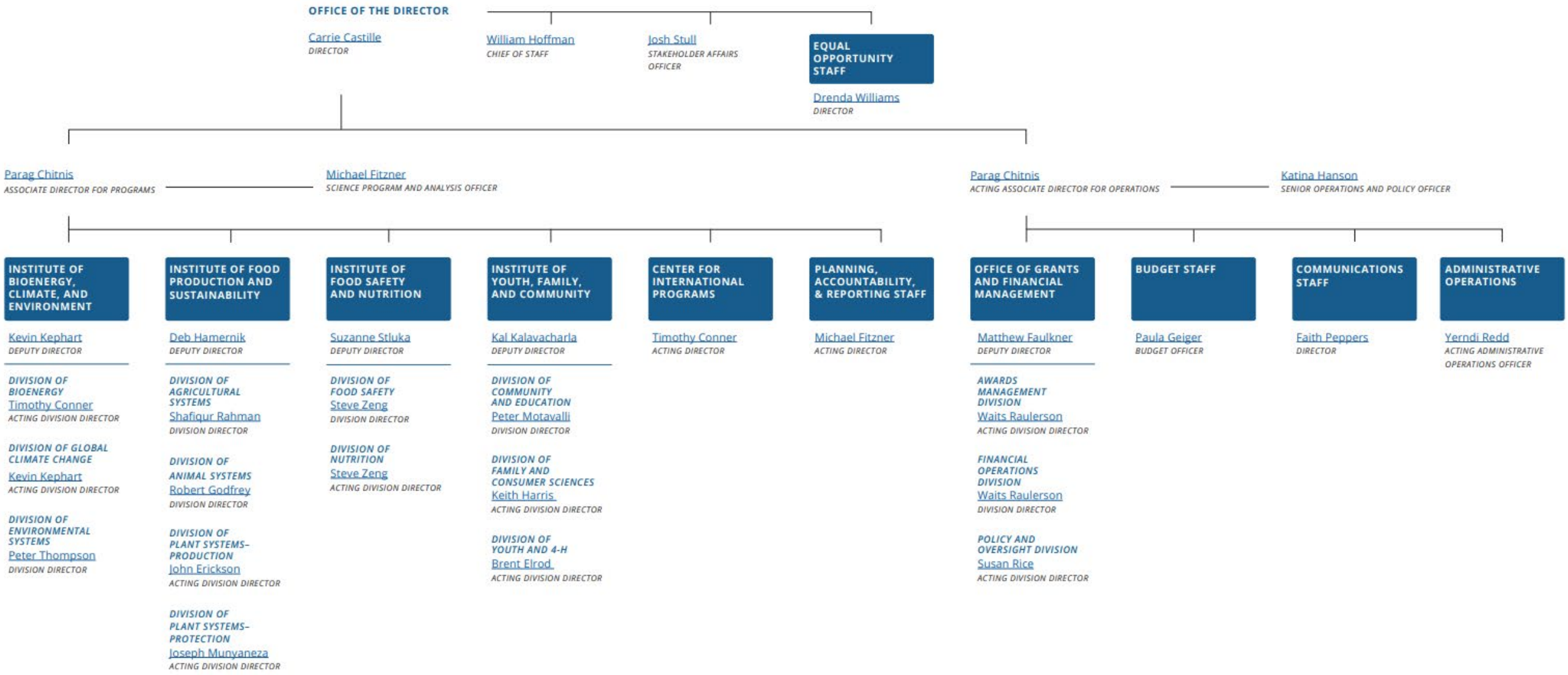
USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

Overview of NIFA and A Wide Array of NIFA Programming

Jim Dobrowolski
National Program Leader
Environmental Sciences Division

USDA NIFA
NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

The Organization of USDA's NATIONAL INSTITUTE OF FOOD AND AGRICUTURE — Revised 09.30.2021

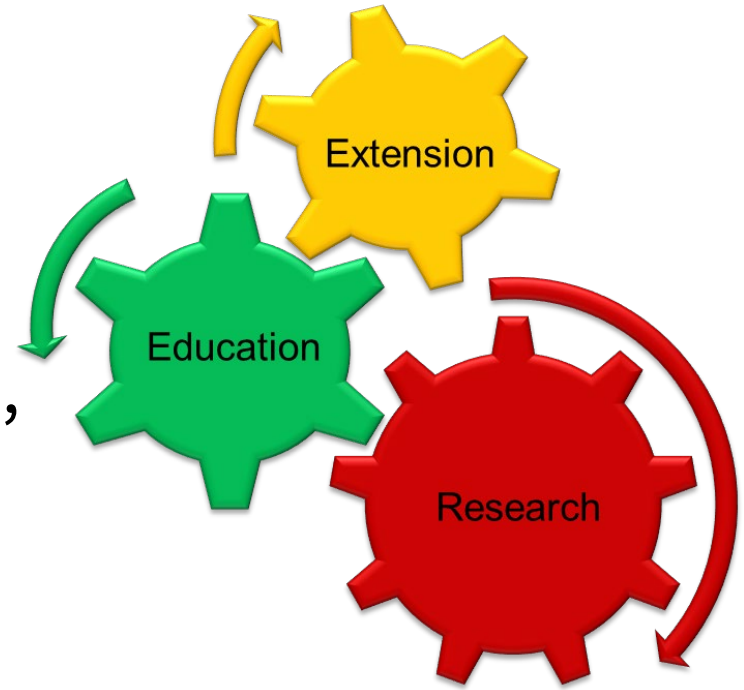


What is NIFA Doing?

NIFA provides leadership and funding for programs that advance agriculture-related sciences

National Institute of Food and Agriculture (NIFA)

- $1.95 billion allocated to NIFA for FY2021
- NIFA provides **capacity (formula) grants** to land-grant universities
- Provides **competitive grants** to support research, education and extension at various institutions
  - Land-grant universities, non-land-grants, minority-serving institutions, community colleges, and other organizations
  - Eligibility varies by program and is listed in each Request for Application (RFA)



How NIFA funds are provided

- **Capacity grants** - for land-grant institutions, schools of forestry, and schools of veterinary medicine to fund research and extension activities. The amount of funds provided to each institution is determined by a formula.

- **Competitive grants** - for fundamental and applied research, extension, and higher education activities, as well as for projects that integrate research, education, and extension functions. Individuals, institutions, or organizations may apply according to criteria listed in the Request For Applications (RFA).

Competitive Grant Programs

- **Agriculture and Food Research Initiative (AFRI)**
- **Mandatory Programs:**
  - Specialty Crop Research Initiative (SCRI)
  - Organic Agriculture Research and Extension Initiative (OREI)
  - Beginning Farmer and Rancher Development Program (BFRDP)
  - Community Food Projects (CFP)
- **Biotechnology Risk Assessment Research Grants Program (BRAG)**
- **Small Business Innovation Research Program (SBIR)**
- **Crop Protection and Pest Management Program (CPPM)**

NIFA Programs Cover Many Topics

Advanced Technologies
- Bioenergy
- Biotechnology
- Nanotechnology

Animals
- Animal Breeding
- Animal Health
- Animal Production
- Aquaculture

Business and Economics
- Markets and Trade
- Natural Resource Economics
- Small Business

Natural Resources
- Air
- Forests
- Grasslands and Rangelands
- Soil
- Water

Education
- Minority Serving Institutions
- Teaching and Learning
- Workforce Development

Environment
- Climate Change
- Ecosystems
- Invasive Pests and Diseases

Farming and Ranching
- Agricultural Safety
- Agriculture Technology
- Farmer Education
- Organic Agriculture
- Small and Family Farms

People
- Community Vitality
- Family Well-Being
- Youth

Food Science
- Food Quality
- Food Safety

Health
- Nutrition
- Obesity
- Wellness

International
- Global Engagement
- Global Food Security

Plants
- Crop Production
- Pest Management
- Plant Breeding
- Plant Health

AFRI RFA & Grant Types

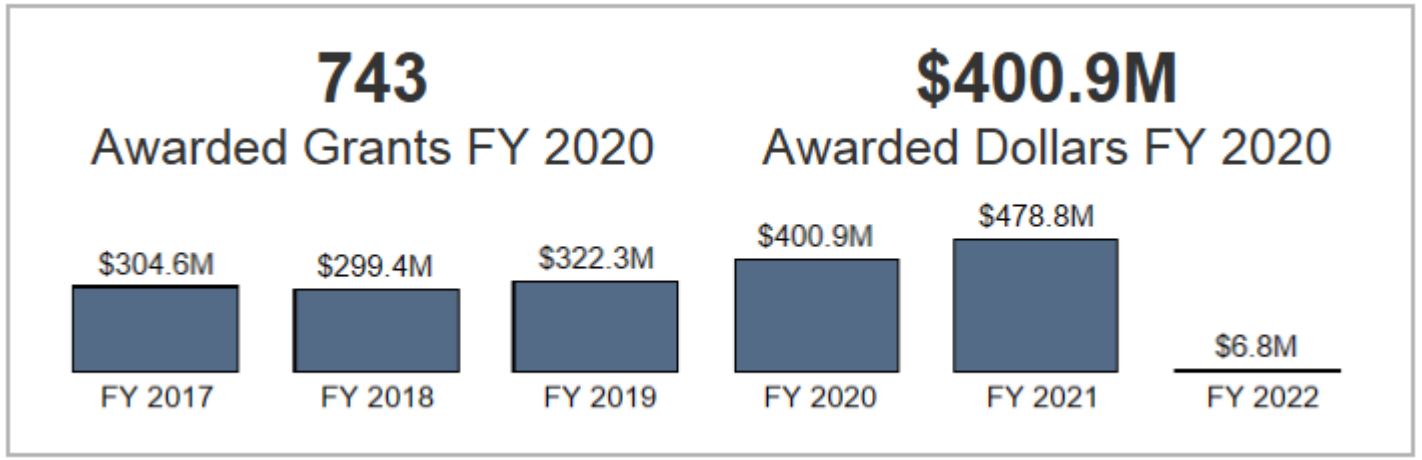
Three RFA types:

1. Foundational and Applied Science
2. Education and Workforce Development
3. Sustainable Agricultural Systems

Grant Types:

- Standard Grants
- Coordinated Agricultural Projects (CAP)
- Conference Grants
- Food and Agriculture Science Enhancement (FASE) Grants
  - Pre- and Postdoctoral Fellowship Grants
  - Strengthening Grants – several types
  - New Investigator Grants

NIFA Grants Overview



SUSTAINABLE AGRICULTURAL SYSTEMS

- A9201 THE BIG KAHUNA $150M, 15 AWARDS FULLY INTEGRATED
- A9211 SYNTHESIS AND PROGRAM EVALUATION $1M
- WEBINAR: HTTPS://WWW.YOUTUBE.COM/WATCH?V=2YHSK0UMDJC&FEATURE=YOUTU.BE
- FOR FY 2021, APPLICATIONS TO THE SAS RFA MUST FOCUS ON SYSTEMS APPROACHES THAT PROMOTE TRANSFORMATIONAL CHANGES IN THE U.S. FOOD AND AGRICULTURAL SYSTEM WITHIN THE CONTEXT OF THE LONG-TERM GOAL OF INCREASING AMERICAN AGRICULTURAL PRODUCTION BY 40% WITH A REDUCTION IN ENVIRONMENTAL FOOTPRINT BY 50% BY 2050. NIFA SEEKS CREATIVE AND VISIONARY APPLICATIONS THAT TAKE A SYSTEMS APPROACH FOR PROJECTS FOCUSED ON THE THEMES IN THE USDA SCIENCE BLUEPRINT: (1) SUSTAINABLE AGRICULTURAL INTENSIFICATION; (2) AGRICULTURAL CLIMATE ADAPTATION; (3) VALUE-ADDED INNOVATION; AND/OR (4) FOOD AND NUTRITION TRANSLATION.

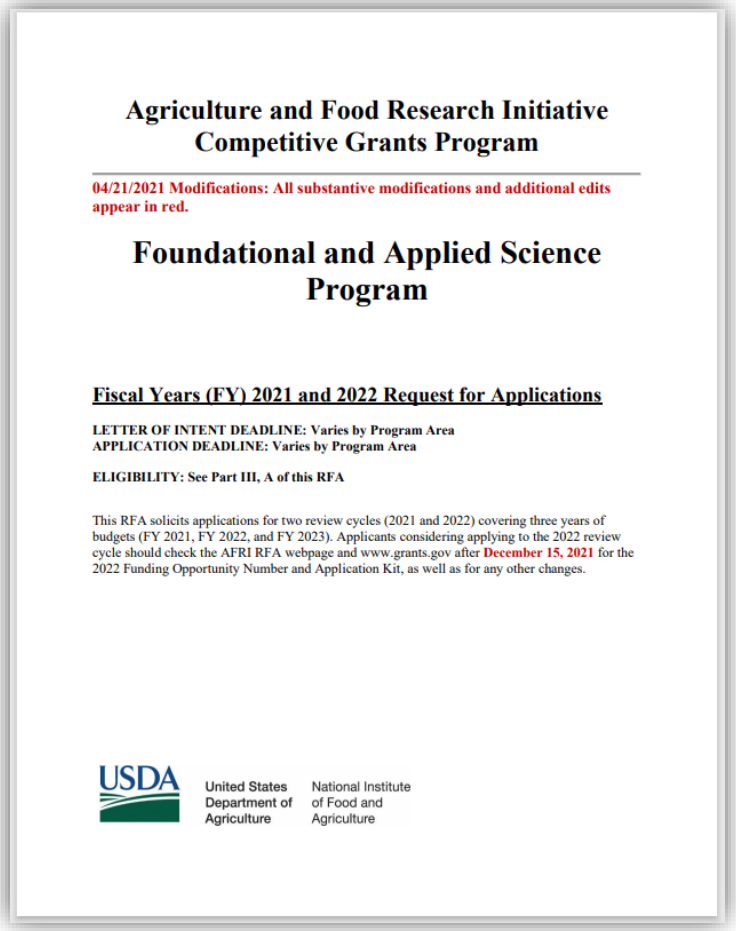
Foundational and Applied Science (FAS):

Aligned with the Farm Bill's Priority Areas:

- Plant health and production, plant products
- Animal health and production, animal products
- Food safety, nutrition, and health
- Bioenergy, natural resources, environment
- Agriculture systems and technology
- Agriculture economics and rural communities

Also

- Cross-cutting Program Area Priorities



Agriculture and Food Research Initiative Competitive Grants Program

04/21/2021 Modifications: All substantive modifications and additional edits appear in red.

Foundational and Applied Science Program

Fiscal Years (FY) 2021 and 2022 Request for Applications

LETTER OF INTENT DEADLINE: Varies by Program Area
APPLICATION DEADLINE: Varies by Program Area

ELIGIBILITY: See Part III, A of this RFA

This RFA solicits applications for two review cycles (2021 and 2022) covering three years of budgets (FY 2021, FY 2022, and FY 2023). Applicants considering applying to the 2022 review cycle should check the AFRI RFA webpage and www.grants.gov after **December 15, 2021** for the 2022 Funding Opportunity Number and Application Kit, as well as for any other changes.

USDA United States Department of Agriculture National Institute of Food and Agriculture

We're Going to Start at the Institute for Food Production and Sustainability (IFPS) Competitive Funding

- Agricultural Systems and Technology (AS&T)
  - –$29 million
  - – Success rate (11-14%)
- Agriculture Economics and Rural Communities (AERC)
  - –$34 million
  - – Success rate (20-47%)

Farm of the Future (FotF)

Purpose and Priorities

The Farm of the Future under assistance listing 10.230 will integrate advances in precision agriculture, smart automation, resilient agricultural practices, socioeconomics, and plant and animal performance. The site will develop data-driven solutions by technology integration to increase productivity, create value-added agricultural products, and enhance connectivity and resilience for thriving rural communities

Farm of the Future (FotF)

Funding Priorities:

- Precision management of crop and animal operations
- Applicability of technology use in a broad range of agricultural enterprises
- Climate-smart practices that positively impact productivity, resilience, and sustainability.
- Farm profitability and economic sustainability of food production using a ‘whole systems’ approach
- Accessible to underserved farmers and ranchers, value traditional and indigenous knowledge, hands-on learning

Farm of the Future (FotF)

- **Application Deadline was** Friday, October 15, 2021
- Total funding available in FY2022: $3,969,000
- Anticipated number of awards: 1
- Project Type: Integrated
- Grant Type: Standard
- Grant Duration: 36-48 months

Contact: Ganesh Bora, ganesh.bora@usda.gov
Vijay Nandula, vijay.nandula@usda.gov
Andres Ciblis, andres.ciblis@usda.gov
Lelan Dixon, lelan.dixon@usda.gov

Nanotechnology for Agricultural and Food Systems (A1511)

Proposed Budget Requests: Not to exceed **$650,000** total per project for project periods of 3-5 years

Project Types: Research only

Grant Types: **Standard**, Conference, and FASE (**Strengthening Standard**, **New Investigator**, Strengthening Conference, Seed, Equipment, and Sabbatical) Grants

Application Deadline: TBD, 2022 (5:00 pm ET)

Contact: Dr. Hongda Chen, Hongda.Chen@usda.gov
Dr. James Dobrowolski, James.Dobrowolski@usda.gov
Dr. Ganesh Bora, ganesh.bora@usda.gov

Nanotechnology for Agricultural and Food Systems (A1511)

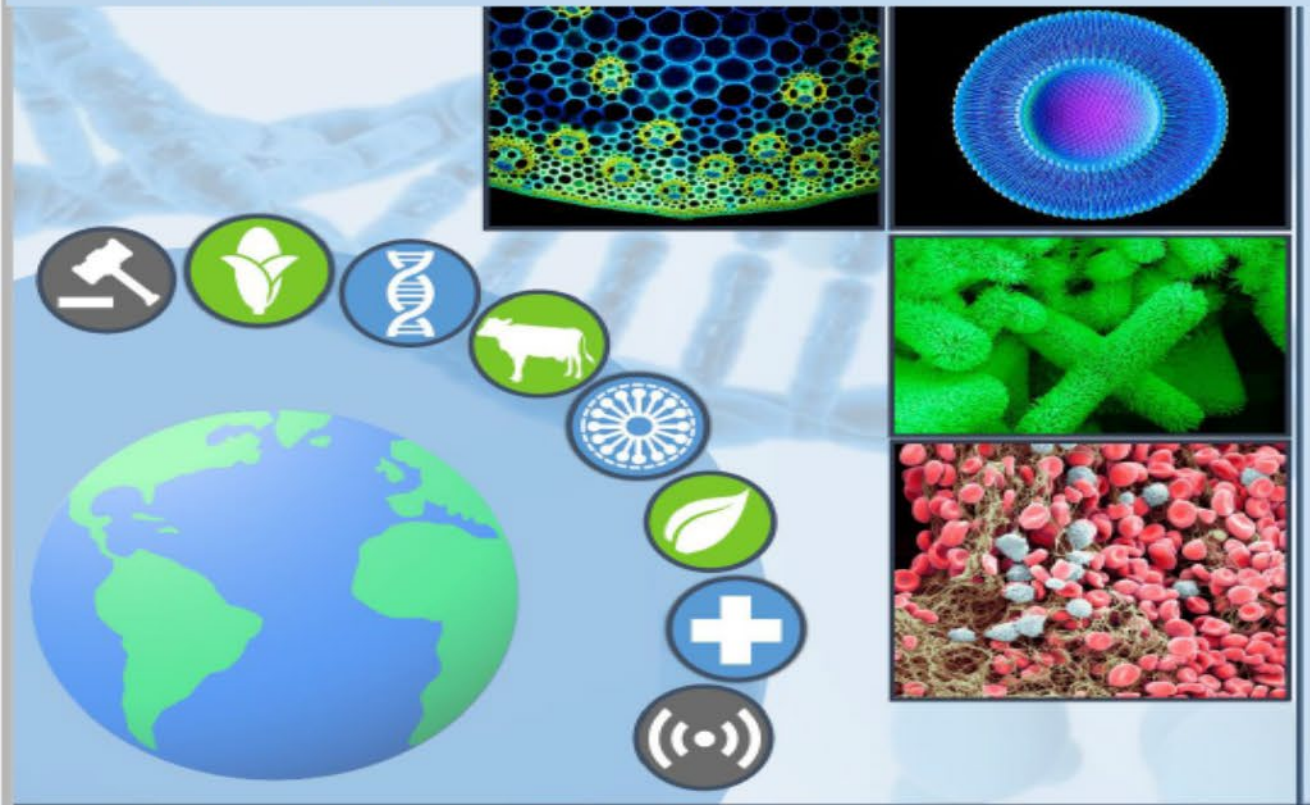
Funding Priorities:

(To advance nanoscale science, engineering and nanotechnology)^(To address societal challenges facing agricultural and food systems)

- Novel uses and high **value-added products** of nano-biomaterials from agricultural and forest origins for food and non-food applications. [Note to the exclusion clause]
- **Environmental, health and safety assessments** of engineered nanoparticles applied in food and agricultural systems, including detection and quantification of engineered nanoparticles, characterization of hazards, exposure levels, transport and fate of the engineered nanoparticles or nanomaterials in foods, agricultural production and environment.
- Nanotechnology-enabled smart **sensors for accurate, reliable and cost-effective** early and rapid detection of targets of interest in agricultural production and food safety.
- Cost-effective distributed sensing networks for **intelligent and precise application of agricultural inputs.**
- **Monitoring physiological biomarkers** for optimal crop or animal productivity and health.
- Discovery and characterization of **nanoscale phenomena, processes, and structures** relevant and important to agriculture and food.

Nanoscale Science and Engineering
for Agriculture and Food Systems

Convergence of nanotechnology with food & agriculture



Southern New Hampshire University, Manchester, NH, US, June 19 - 24, 202

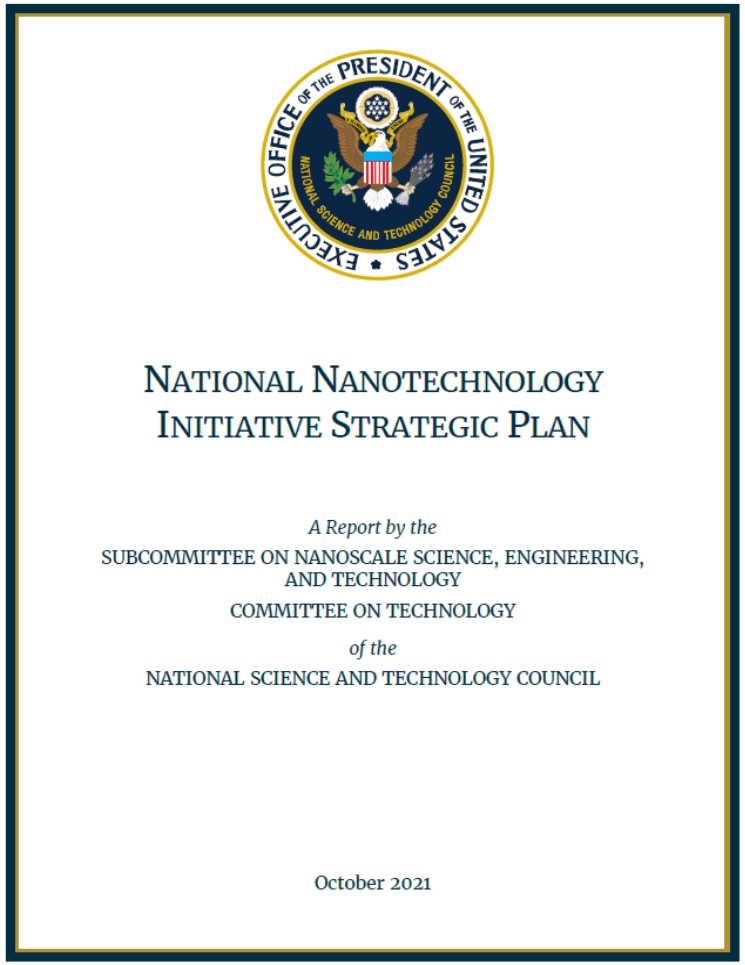
Discussion Topics

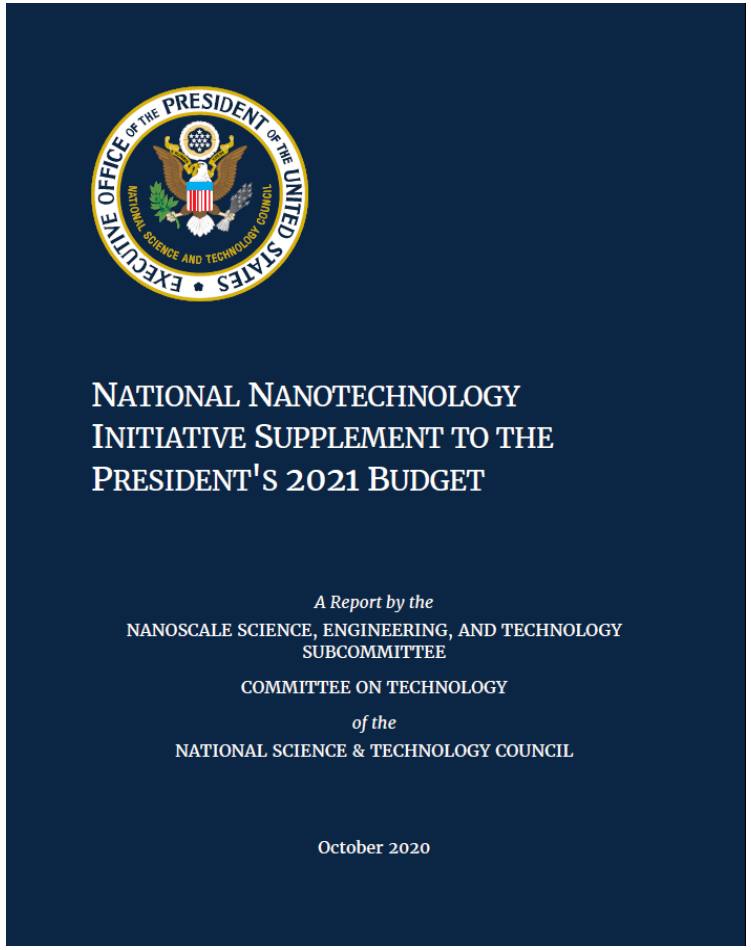
1. *Convergence of nanotechnology with food & agriculture*
2. *Advances in Nanomaterials*
3. *Environmental Nanotechnology*
4. *Nano-enabled approaches to improving human and animal health*
5. *Translation of nano-based science for application in food & agriculture*
6. *Internet of Food & Ag Nano-things: Big Data, Machine Learning, AI, Modelling*
7. *Emerging Investigators Session*
8. *Nanotechnology's impact on food safety*
9. *Nanotechnology's role in agriculture*

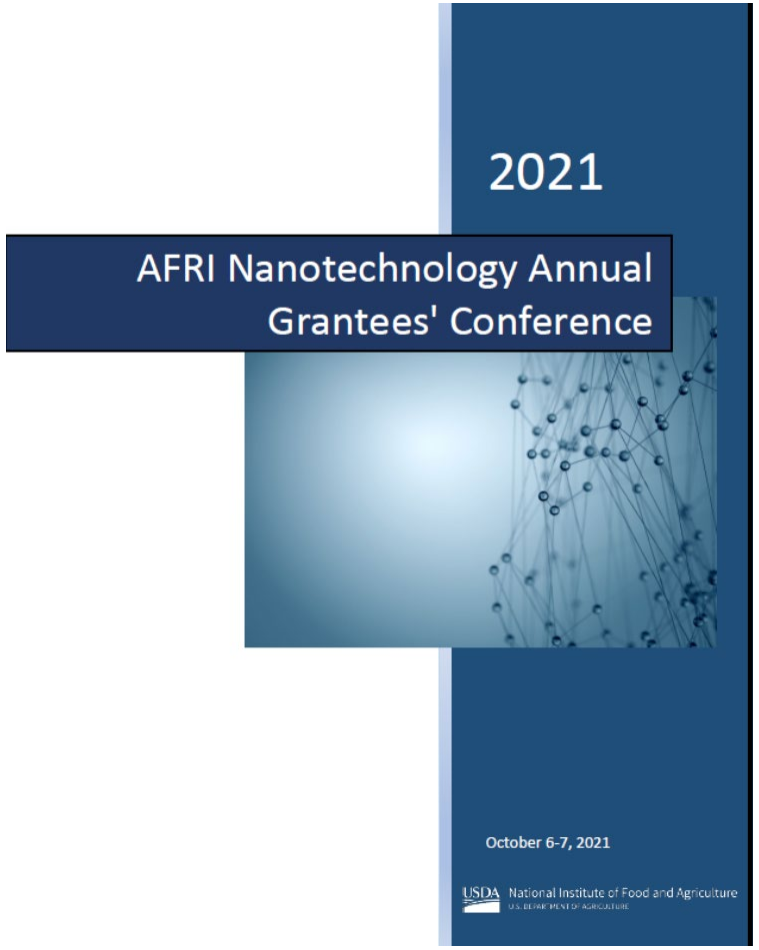
Gordon Research Conference
Frontiers of Science

Gordon Research Seminars
Graduate Research

Chair: Antje Baeumner, University of Regensburg
Co-Chair: Julie Goddard, Cornell University
Vice Chair: Carmen Gomez, Iowa State University
Co-Vice Chair: Melanie Kah, University of Vienna, Austria
GRS Chair: Ying Wang, UC Santa Barbara
GRS co-Vice Chair: Daniel White, UC Riverside
https://www.grc.org/programs.aspx?id=16885


NATIONAL NANOTECHNOLOGY INITIATIVE STRATEGIC PLAN
A Report by the
SUBCOMMITTEE ON NANOSCALE SCIENCE, ENGINEERING, AND TECHNOLOGY
COMMITTEE ON TECHNOLOGY
of the
NATIONAL SCIENCE AND TECHNOLOGY COUNCIL
October 2021


NATIONAL NANOTECHNOLOGY INITIATIVE SUPPLEMENT TO THE PRESIDENT'S 2021 BUDGET
A Report by the
NANOSCALE SCIENCE, ENGINEERING, AND TECHNOLOGY SUBCOMMITTEE
COMMITTEE ON TECHNOLOGY
of the
NATIONAL SCIENCE & TECHNOLOGY COUNCIL
October 2020


2021
AFRI Nanotechnology Annual Grantees' Conference
October 6-7, 2021
USDA National Institute of Food and Agriculture

Engineering for Agricultural Production and Processing (A1521)

Funding Priorities:

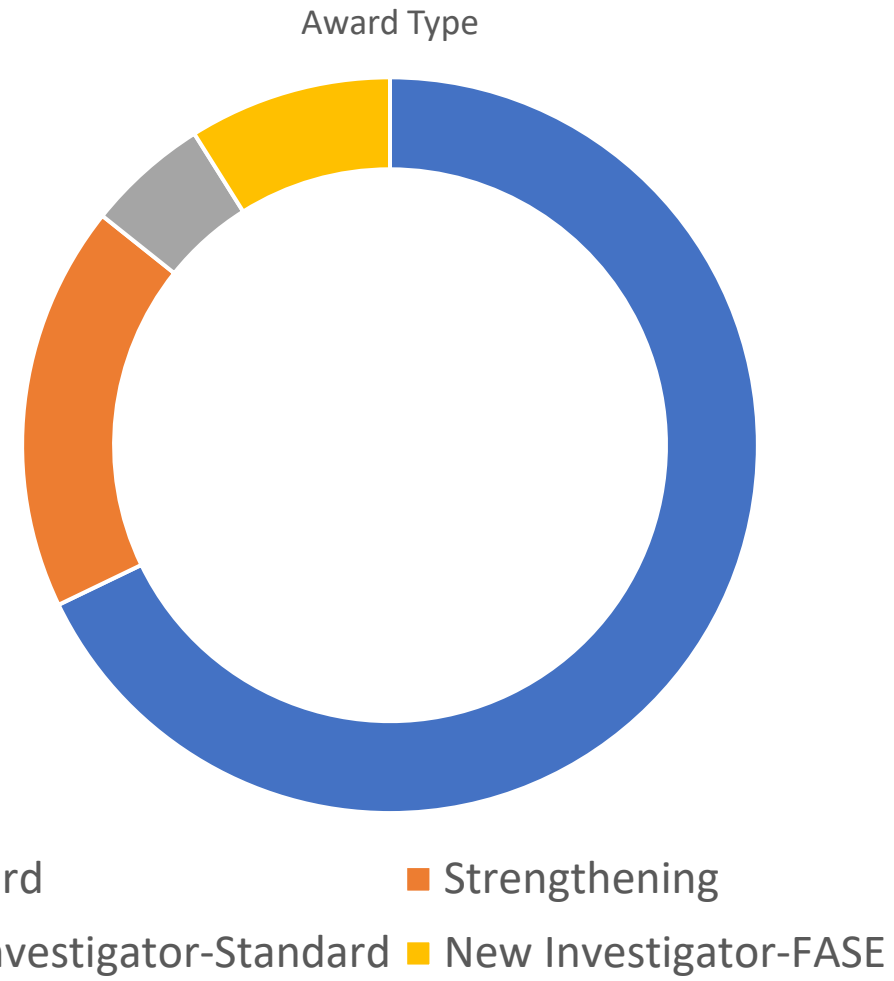
- Engineered **devices, technologies, and tools** to improve agriculturally relevant plant, animal, forestry, and natural resource systems.
- Enable engineering, sensing, computing, modeling, automation, and information systems
- Develop systems for automation and mechanization of **labor-intensive tasks** in crop and animal production.
- Develop and test the implementation of tools and **precision technologies**
- Explore the use or development of advanced computational or engineering methods…that enable more effective use of **big data**.

Engineering for Agricultural Production and Processing (A1521)

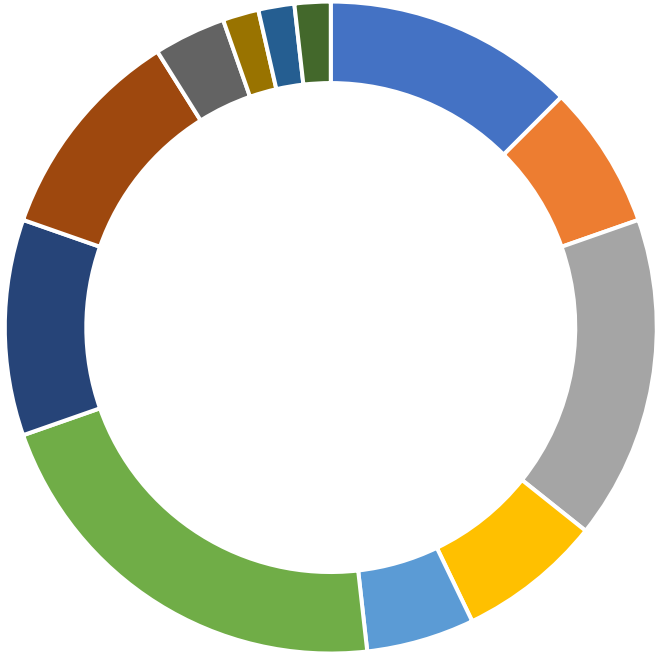
Funding Priorities (cont'd):

- Develop and improve engineering technologies that prevent **disease spread/pathogens** in agricultural systems.
- Develop and test risk assessment and mitigation measures applicable to agriculture (in particular, reduce hazards to agricultural workers that **can include assistive technologies**).
- Integrated projects that provide engineering solutions for conservation of energy and water resources in **irrigation. (several sub-parts delineated in RFA)**

Award Types: FY16-FY20 (n=56)



Award Research Categories, n=56



- Animal Welfare, Health and Nutrition
- Pest and Disease Management
- Precision Agriculture
- Phenotyping Systems
- Gaseous Emissions
- Irrigation, Water Quality & Nutrient Management
- Harvesting Systems
- Orchard Management
- Grain Handling

Biorefining and Biomanufacturing (A1531)

- A biorefinery is a system that integrates biomass conversion, processes, and equipment to manufacture biofuels, chemicals, and bioproducts. This program area priority focuses on converting, treating, processing, refining, or manufacturing products that utilizes plant, animal, and woody biomass.
  - Improve or expand production efficiency and capacity of biomass, biofuels, chemical feedstocks, renewable energy, and bio-based products.
  - Improve or expand utilization of waste and byproducts generated in agricultural and food systems.
  - Engineer new or improved products and processes that utilize materials from agriculture or micro-organisms (including, but are not limited to, bioplastics and biocomposites).
  - Address the long-term sustainability of biorefining or biomanufacturing systems that balance productivity along with positive economic, environmental, and social outcomes including the application of “circular bioeconomy” principles, lifecycle analysis (LCA), and techno-economic assessment (TEA).
  - Identify the socio-economic factors that either constrain or encourage the acceptance of engineered products and biomanufacturing processes in the marketplace.

Small and Medium-Sized Farms (A1601)

Economics, Markets and Trade (A1641)

Funding Priorities: supports research on development of theories, methods and applications of agricultural economics. It encourages applications in the following broad areas:

- agricultural market structure and performance;
- competitiveness in international trade and domestic markets;
- agricultural production and resource use;
- consumer behavior;
- farm labor and immigration and policy;
- agricultural policy design and impacts;
- technology development and adoption;
- science and innovation policy; and
- issues relating to environmental and natural resource economics.

Economics, Markets and Trade (A1641)

Proposed Budget Requests: $650,000 total per project for project periods of 3-5 years. An additional $150,000 may be requested for projects involving significant collaboration with minority-serving institutions, small- to mid-sized institutions, EPSCoR state institutions, and/or international partners.

Project Types: Research only projects

Grant Types: Standard, Conference, and FASE (Strengthening Standard, New Investigator, Strengthening Conference, Seed, Equipment, and Sabbatical) Grants only

Application Deadline: October 6, 2022

Social Implications of Food and Agricultural Technologies (A1642)

Funding Priorities: Examining the economic and social implications of technology is a form of technology assessment that anticipates the unforeseen and unintended consequences of technological innovation, including cultural, health, welfare, equity, and ethical. Projects must address the following:

- Assess the broad social, ethical, cultural, legal, and other potential impacts that a broad range of emerging and disruptive technologies,
- Involve a range of individuals including scientists, legal scholars, bioethicists, social scientists, and researchers from the humanities, the public, and other stakeholders

Technologies and scientific advancements of interest include:

- Application of gene editing and gene drives in agricultural systems
- Application of nanotechnology in agriculture and food systems
- Analysis of big data, implications of artificial intelligence, machine learning and predictive decision
- Implementation of autonomous technologies and systems within the agricultural production, food manufacturing, and supply chains.

Social Implications of Food and Agricultural Technologies (A1642)

Proposed Budget Requests: $650,000 total per project for project periods of 3-5 years

Project Types: Research only or integrated projects

Grant Types: Standard, Conference, and FASE (Strengthening Standard, New Investigator, Strengthening Conference, Seed, Equipment, and Sabbatical) Grants only

Application Deadline: November 3, 2022

Environmental and Natural Resource Economics (A1651)

Funding Priorities: advances economic theories/tools/analyses in ecosystem valuation, nonmarket benefit valuation; NRE/conservation policy; agro-environmental interaction

- Economics of conservation and environmental policies – impacts on ag and rural communities
- Design of incentive mechanisms and policies
- Ecosystem service valuation uses, enhancements, limitations, standardization, indicators, novel approaches, etc.
- Benefit transfer studies

Environmental and Natural Resource Economics (A1651)

Proposed Budget Requests: $500,000 for up to 4 years

Project Types: Research only projects

Grant Types: Standard, Conference, and FASE (Strengthening Standard, New Investigator, Strengthening Conference, Seed, Equipment, and Sabbatical) Grants only

Application Deadline: November 3, 2022

Rural Economic Development (A1661)

- Requested Project Types: Research Projects or Integrated (research with education and/or extension) Projects only

- Requested Grant types: Standard Conferences, and FASE (Strengthening Standard, New Investigator, Strengthening Conference, See, Equipment, and Sabbatical) Grants only.

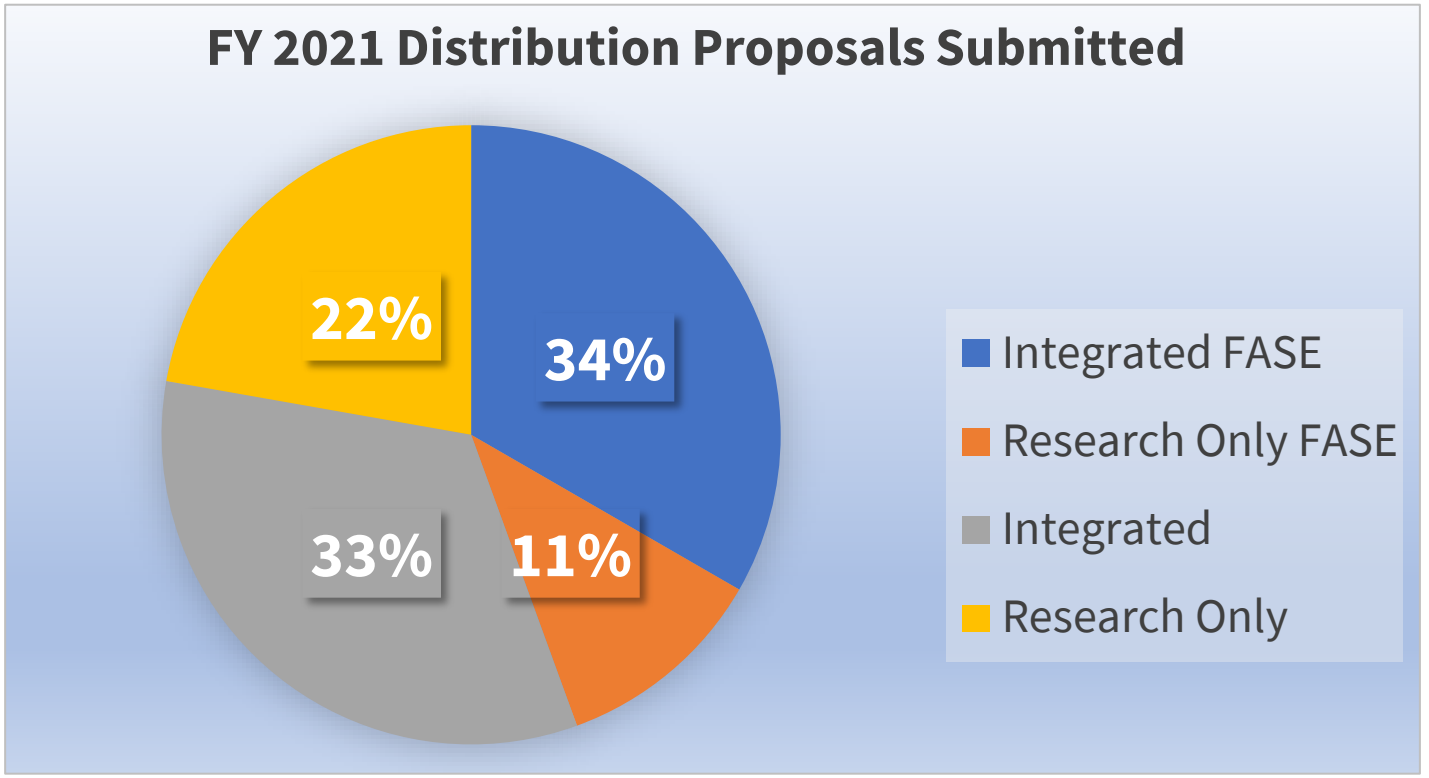
Rural Economic Development (A1661)

Priority: Support rigorous theoretical and empirical efforts to create and examine Innovative approaches for advancing economic opportunities for rural entrepreneurs and Communities, with an aim to promote rural prosperity and well-being

The Intent of the program is to improve the understanding of the factors and conditions that enhance economic opportunities for food, agricultural rural businesses, through tools and methods from various social Sciences (i.e. sociology, demography, geography, history, anthropology).

Studies that focus on women and ethnic groups are of interests.

Rural Economic Development (A1661)



FY 2021 26% of the proposals funded

Cross-Cutting Programs

Critical Agricultural Research & Extension (CARE)

Funding Priorities: Critical challenges and opportunities that research and extension, together, can addresses address to improve our nation's agricultural and food systems

- Projects should include:
  - Integrated activities based on rigorous **research combined with effective extension**
  - Involvement of stakeholders to develop and rapidly apply new knowledge or practices
  - Contribute to improved well-being of the people, communities, plants, and animals involved in, and affected by, agriculture and food-production systems.
- See the AFRI Foundational & Applied Science RFA for more information.

Data Science for Food & Agricultural Systems (DSFAS)

Funding Priorities: data science to enable systems and communities to effectively utilize data, improve resource management, and integrate new technologies and approaches to further U.S. food and agriculture enterprises

The most competitive proposals will be equally well grounded in agricultural science and data science.

- Applications for research and integrated research projects must address one or more of the following data science priorities in relation to food and agricultural systems:
  - –Analysis of Agricultural Data
  - –Connect Multi-scale, Multi-domain or Multi-format Agricultural Data
  - –Agricultural Applications and Human-Technology-Data Interactions
- See the AFRI Foundational & Applied Science RFA for more information including special emphasis projects that apply artificial intelligence and machine learning and specifics for Coordinated Innovation Networks projects.

Inter-Disciplinary Engagement in Animal Systems (IDEAS)

Funding Priorities:

- Precision animal management
  - precision feeding, breeding, management and animal health to ensure and enhance economic viability
    - UAV-based imaging for facial recognition, body size and temperature, physical activity
- Environmental synergies of animal production
  - managing emissions; recycling, reusing co-products of animal agriculture; optimizing animal management for environmental health
- Societal aspects of animal welfare
  - building trust around animal agriculture; consumer experiences that influence perceptions of agricultural animal well-being; public engagement in the policy and practices of animal agriculture for improved animal welfare

Extension, Education and USDA Climate Hubs Partnership

Supports projects that provide *effective*, *translatable*, and *scalable* approaches to address climate change through **regional partnerships** including the USDA Climate Hubs and extension (e.g., the Cooperative Extension Service)

Program Area Priority Description

***Should work towards one or more long-term socio-economic impacts**

1) net-zero emissions agriculture

2) working lands adapted to climate change

3) a diverse workforce that can effectively communicate about climate change with a variety of stakeholders and can incorporate climate considerations into managing working lands

4) climate justice including equity in opportunities and burden-sharing

Amy

Beginning Farmer/Rancher Development Program BFRDP

- Beginning farmer education for adult and young audiences in the United States can generally be traced back to the advent of the 1862 and 1890 Morrill Land-Grant Acts.
- But, for the first time, the Food, Conservation, and Energy Act of 2008 (Pub .L. No. 110-234, Section 7410) appropriated $75 million for FY 2009 to FY 2012 to develop and offer education, training, outreach and mentoring programs to enhance the sustainability of the next generation of farmers.

Applications from partnerships and collaborations that are led by or include nongovernmental organizations (NGOs), community-based organizations (CBOs), and school-based agricultural educational organizations (SAEOs) with expertise in new agricultural producer training and outreach will be given priority in funding. By statute, BFRDP grants may fund programs or services relating to:

1. Basic livestock, forest management, and crop farming practices;
2. Innovative farm, ranch, and private, nonindustrial forest land transfer and succession strategies;
3. Entrepreneurship and business training;
4. Technical assistance to help beginning farmers or ranchers acquire land from retiring farmers and ranchers;
5. Financial and risk management training, including the acquisition and management of agricultural credit;
6. Natural resource management and planning;
7. Diversification and marketing strategies;
8. Curriculum development;
9. Mentoring, apprenticeships, and internships;
10. Resources and referral;
11. Farm financial benchmarking;
12. Agricultural rehabilitation and vocational training for veteran farmers and ranchers;
13. Farm safety and awareness;
14. Food safety and recordkeeping, and
15. Other similar subject areas of use to beginning farmers or ranchers

Biofuels and Biobased Products SBIR 8.8

Title	Description
Program Code:	8.8
Program Code Name:	Biofuels and Biobased Products
CFDA Number	10.212
Project Type:	Research
Grant Type:	Standard
Application Deadline	November 3, 2021
Grant Duration:	8 Months
Anticipated # of Awards:	6
Maximum Award Amount:	$175,000 or $181,650 with TABA

Research Priorities:

Examples of appropriate subtopics for research applications from small businesses include, but are not limited to, the following:

1. **New Non-food Biobased Products from New Industrial Crops**
2. **New Processes for the Manufacture of Industrial Products, Chemicals, or Biofuels**

Small and Mid Sized Farms SBIR 8.12

Title	Description
Program Code:	8.12
Program Code Name:	Small and Mid-Size Farms
CFDA Number	10.212
Project Type:	Research
Grant Type:	Standard
Application Deadline	November 3, 2021
Grant Duration:	8 Months
Anticipated # of Awards:	9
Maximum Award Amount:	$125,000 or $131,650 with TABA

Research Priorities:

Examples of appropriate subtopics for research applications from small businesses include, but are not limited to, the following:

New Agricultural Enterprises, Development of New Marketing Strategies, Farm Management, Urban Farming, On Farm Natural Resources Renewable Energy and Climate Smart Agriculture and Post-Harvest Technology

Plant Production and Protection (Engineering) SBIR 8.13

USDA

SBIR
America's Seed Fund

Title	Description
Program Code:	8.13
Program Code Name:	Plant Production and Protection (Engineering)
CFDA Number	10.212
Project Type:	Research
Grant Type:	Standard
Application Deadline	November 3, 2021
Grant Duration:	8 Months
Anticipated # of Awards:	9
Maximum Award Amount:	$175,000 or $181,650 with TABA

Research Priorities:

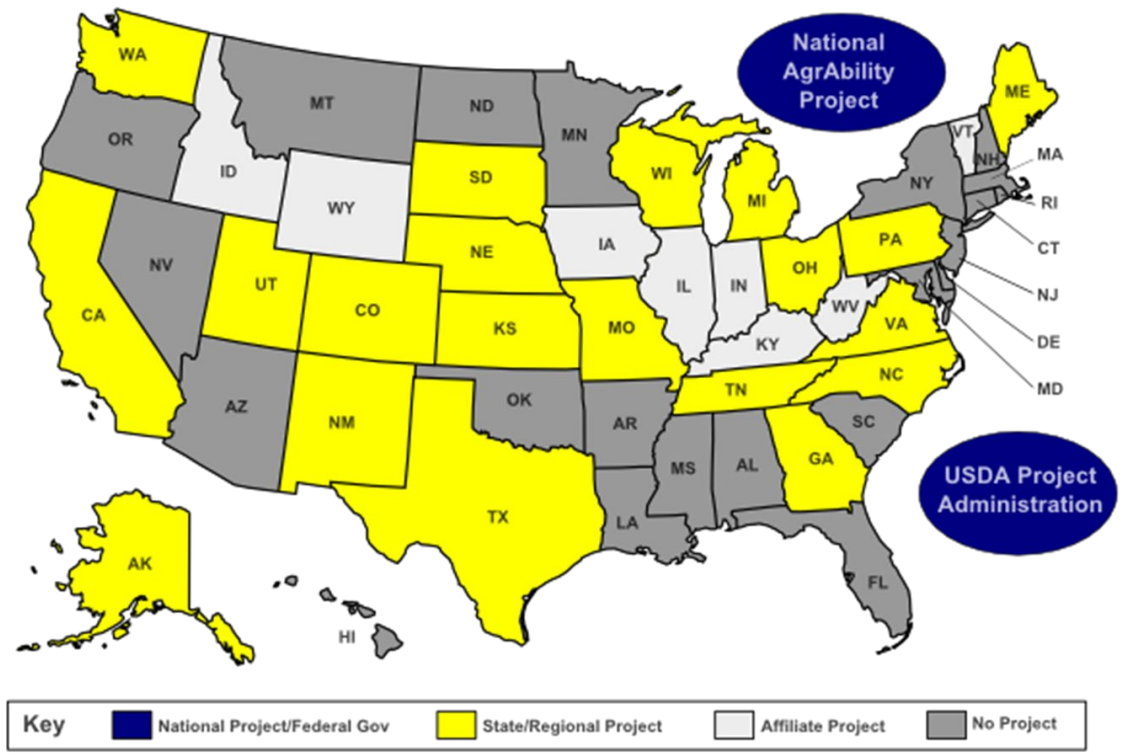
Examples of appropriate subtopics for research applications from small businesses include, but are not limited to, the following:

1. **Improved crop production methods and strategies**
2. **Plant protection against abiotic and/or biotic stresses**
3. **Pollinators and crop production**

AgrAbility

AgrAbility
Cultivating Accessible Agriculture

- Authorized through the 1990 Farm Bill
- Competitive funded through Extension Smith –Lever 3(d) beginning FY 1991
- Modeled after state programs that assisted farmers and ranchers with disabilities
- Created partnership between land grant universities and non-profit disability organizations
- Grown from 8 awards in 1991 to 22 awards in 2021 total $4.5M



AgrAbility funds support

AgrAbility
Cultivating Accessible Agriculture

- Education—long term investment strategy
  - Accommodating disabilities and avoiding secondary injuries
  - Directed towards health, farm, and government service providers
- Networking
  - Sharing of information and provision of services
  - Customers, peer supporters, volunteers, stakeholders, other funding organizations, etc.
- Assistance
  - Focusing on individualized consultative services increasing likelihood of client's success in farm operation
  - Includes client and others working at same place
- Marketing
  - Increasing awareness of AgrAbility and its initiatives

AgrAbility Outcomes

AgrAbility
Cultivating Accessible Agriculture

- Increased knowledge of practices and activities for agricultural producers with disabilities
- Increased appropriate assistance options
- Improved modifications that increase independence and productivity
- Increased chance that individuals with disabilities and their families can continue to be successfully involved in production agriculture

Youth Farm Safety Education and Certification

History

1970's

- Hazardous Occupation Orders for Agriculture (HOOA) 11 major categories
- Extension 4-H and Vo Ag programs education and certification programs implemented for 14-15 yr. to perform tasks in categories 1&2

2001 Extension Smith –Lever 3(d) Funding

- Funding for Youth Farm Safety Education and Certification competitive grant program appropriated
- Develop new curriculum to support current standards

Youth Farm Safety Education and Certification

Current Projects funded

- National Clearinghouse Project – to continue efforts made to date with SAY Clearinghouse, curricula submission and review, marketing of the Clearinghouse, and SAY National Steering Committee. **University of Nebraska**

- Instructor Training Project – to support recruitment and training of youth farm safety instructors in currently available youth farm safety curricula. **Utah State University**

- Youth Training Project – to continue with development of new/enhancement of current youth farm safety curricula, implementation/piloting of those curricula with youth, and evaluation of youth training. **Ohio State University**

National Steering Committee

- Ag Safety and Health Council of America
- National Children's Center
- National FFA Organization
- USDA-NIFA (4-H)
- Agri-Safe Network
- American Farm Bureau Federation
- National Grange
- National Council for Agricultural Education
- American Association for Agricultural Educators
- NIOSH Ag Centers
- Purdue University
- Penn State University

Youth Farm Safety Education and Certification Impacts

Instructor workshops for the National Safe Tractor and Machinery Operation Program (NSTMOP) trained 58 State Master Trainers (SMT) from 38 states.

Current curriculum now address over 200 competencies of desired learning outcomes

Over 600 test questions have been validated to “test to competencies” for HOOA written exam

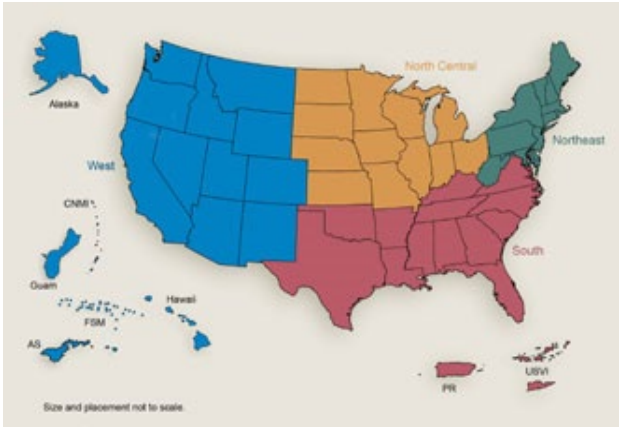
The *Gearing up for Safety* 2020 version now consists of 15 lessons that addresses the knowledge-based competencies and one unit designed to assess the student’s ability to demonstrate safe operator skills.

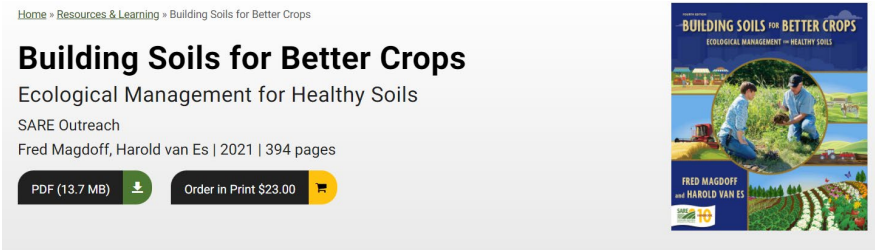
Develop programs to mitigate agricultural hazards to young workers, regardless of knowledge, experience, ability, ethnicity, or culture.

- Ohio State developed culturally sensitive curriculum for Amish Youth and held training camps
- Purdue University translated written instructional material into visual or pictorial formats for youth and adults with limited reading and reading comprehension skills or use English as a second language.
- Montana developed farm safety curriculum targeting Native American youth including lessons on, tractor safety hay handling safety and equine safety,

Sustainable Agriculture Research and Education (SARE)

- A Regional Program Directed by Administrative Councils and Administered by Host Institutions since 1988
- $40,000,000/year appropriation beginning in FY2021
- Four Regional Host Institutions—each manages 4-6 competitive grant programs
  - North Central: University of Minnesota
  - Northeast: University of Vermont
  - Southern: University of Georgia
  - Western: Montana State University
  - NRCCO: University of Maryland
- National Reporting, Coordinating, and Communications Office (NRCCO)
  - Maintains the projects database, grants management center, and website
  - Publishes books and bulletins
- $334 million in funding since 1988
- Around 400 new projects/year funded
- 7,000+ projects total to date





- SARE's Four Pillars (directly from the definition of sustainable agriculture)
  - –Productive and Efficient
  - –Economically Sustainable
  - –Environmentally Sustainable
  - –Socially Sustainable
- Stakeholder engagement
  - –Farmers: involved in problem identification, research, outreach
  - –Administrative Council
    - One in each region
    - Membership legislatively mandated
    - Key role: Selecting projects

- SARE Attributes and Grant Types
  - Inclusive and Accessible
    - Open to all types of farming – large or small; organic or conventional; urban or rural; row crop, livestock, small fruit and vegetable, and aquaculture
    - Open to different points on the value chain – production, processing, or marketing
    - Not restricted to specific disciplines
  - Primary Grant Types
    - Research Grants
      - Large Research and Extension (~$300k)
      - Smaller grants ($5-50k)
        - » Farmer/Rancher
        - » Farmer + Professional
        - » Graduate Student
    - Professional Development and Training
      - State Programs
      - Competitive Grants: Train-the-Trainer ($50-100k)




UV-B Global Change Monitoring and Research Program

- Program was initiated in 1992 by the USDA to monitor solar UV-B irradiance levels over wide geographic areas of the United States and to assess the impact of ultraviolet radiation on crops, plants, animals, and ecosystems.
- Wei Gao, PI – Univ. of Colorado
  - CoPIs - Xin-Zhong Liang (University of Maryland), and Dr. K. Raja Reddy (Mississippi State University).
- Project Components:
  - 1) UV-B MONITORING AND WEATHER NETWORK: 40-station network delivers climate data in near real-time via the program's web site and are used directly by a wide range of researchers, including those who are working on climate and crop models.
  - 2) CLIMATE-CROP MODELING: The agricultural community and decision makers require reliable crop yield assessment tools to determine optimal cultural practices, assess risks and risk management strategies, and determine economic impacts.
  - 3) UV-B EFFECTS/RESPONSE STUDIES: The analysis and understanding of crop responses to UV-B, either alone or in combination with other stress factors, provide information that can be useful to quantify crop effects and response to stress factors, among other measures.

UV-B Global Change Monitoring and Research Program

- Funding has continued in 3-year continuation cycles at 1.3M/year
- RFA was created in 2016 and sole application was paneled + site visit.
- Improvements made based on review:
  - Bolster the climate/crop modeling portion of the project
  - Concentrate more heavily on economic analysis algorithm which is used to estimate the value of potential crop losses for various regions
- Due to KC move, a waiver was granted for competition in 2019. Panel review + site visit will occur for 2022

Nat'l Robotics Initiative (NRI)

- NSF-NIFA Collaboration - Applications are sent via FastLane to NSF, Ag. Panel is formed with assistance from NIFA NPL ; top proposals are funded by NIFA
- Total Funding: 5M/year
- Funding level: 1.2M/grant

Program supports fundamental research in the United States that will advance the science of robot integration.

The program supports research that promotes integration of robots to the benefit of humans including human safety and human independence.

Collaboration between academic, industry, non-profit, and other organizations is encouraged to establish better linkages between fundamental science and engineering and technology development, deployment, and use

NIFA Funding Priorities for the NRI

- Scalable Robotic Technologies – examples
  - Automated and mechanized intelligent systems that focus on **labor-intensive tasks** in production and distribution of crops;
  - Automated systems for planting, scouting, spraying, culturing, irrigating, and harvesting plant crops (including forests) to decrease costs, **improve efficiency**, or reduce inputs of water, fertilizer, or chemicals;
  - Improved robotics for inspection, monitoring, culturing, sorting, and handling of plants and flowers in **controlled environment facilities** and nurseries, or for managing or studying (e.g., monitoring, inspecting, sorting, vaccinating, deworming) large numbers of live animals, either domestic or wild;
  - Automated systems for inspection, sorting, **processing**, or handling of animal or plant products (including forest products) in post-harvest, processing, or meat processing, or product distribution environments;
  - Multi-modal and rapid sensing systems for detecting defects, ripeness, physical damage, microbial contamination, size, shape, and other **quality attributes** of plant or animal products (including forest products), or for monitoring air or water quality.

NIFA Funding Priorities for the NRI

- Configurable Multi-Agent Teams
  - –High-level task planning, execution, and control systems for **spatially distributed** autonomous or semi-autonomous robots
    - operate in concert with co-workers, either human, robotic, or other devices/systems;
  - –Innovative use of intelligently coupled **robot drones and unmanned ground vehicles (UGVs)** to improve crop and animal management;
  - –**Communication protocols** and standards for inter-agent coordination (including natural language) and for unsupervised collaboration;
  - –Distributed intelligence, fault tolerance, and **"failure with grace“**
    - allows high-level task completion despite failure of one or more agents (or teams) or temporary loss of human attention

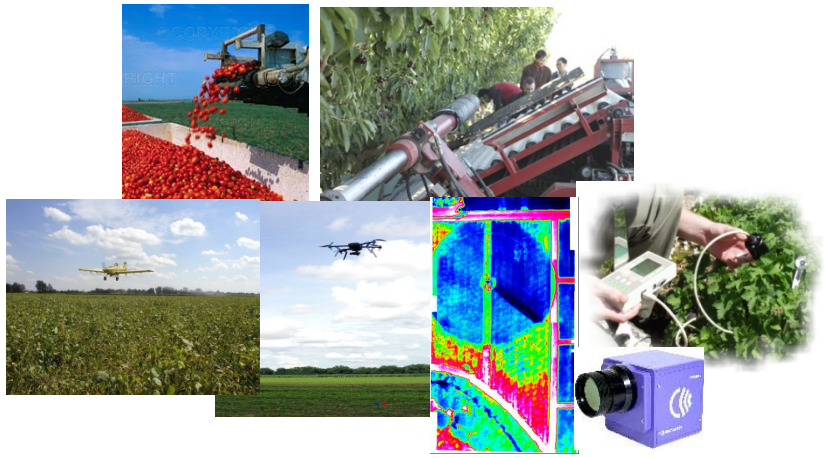
Cyber-Physical Systems (CPS)

- NSF-NIFA Collaboration
- Total Funding:
  - Past: 5M/year. Now: On selective basis
- Funding level: 1.2M/grant; 1.6M/grant with Transition to Practice (TTP) option

Cyber-Physical Systems (CPS) are engineered systems that are built from, and depend upon, the seamless integration of computation and physical components.

Cyber-Physical Systems for Agriculture

- Encourages projects that advance science and technology applied to a). Smart & Connected Communities (S&CC); b). real-time agricultural data analytics and control
- All CPS entries specifying NIFA as funding agency have been within in the real-time agricultural data analytics and control sub-area.
- We funded three S&CC proposals (already paneled at NSF for NIFA's interest) since 2016



- CPS assist in delivering food, fiber, fuel, and feed within a changing global climate while reducing agriculture's environmental footprint and managing biotic threats to production.
- Challenges/Obstacles
  - Farmer trust in DSS recommendations
  - Cost
  - Access
  - Labor shortages
  - Concern of consultants- utilization of massive amounts of data
- Practice/deployment/successes
  - DSS for early detection and mitigation of row crop diseases
  - Subclinical detection of Mastitis
- Opportunities: Enhancement of Smart Communities aspect. NIFA-funded examples:
  - **PI Metoyer** U. Notre Dame - Food Information Networks (FINs):Building data-driven supports for increasing access and healthy food choices in low-income neighborhoods
  - **PI Vahedifard** MSState - Reducing the Vulnerability of Disadvantaged Communities to the Impacts of Cascading Hazards under a Changing Climate

AI Institutes

- NSF-NIFA Collaboration
  - Ann Stapleton, Steve Thomson, Ganesh Bora (NIFA); Jim Donlon, Rebecca Hwa (NSF)
- Total Funding:
  - 40M for two projects, but funded on a per-year basis as continuations
- Funding level for each project: 4M/year for 5 years
- Proposals evaluated by panel and Reverse Site Visits (RSV) based on ranking
- Funded 2020
  - AIFarms – Vikram Adve, PI (UIUC)
  - AIFS – Ilias Tagkopoulos PI (UC Davis)
- Newly funded for 2021
  - Agricultural AI for Transforming Workforce and Decision Support (AgAID) - Anantharaman Kalyanaraman, PI (WSU)
  - AIIRA: AI Institute for Resilient Agriculture - Baskar Ganapathysubramanian (Iowa State U)

AI Institutes

- USDA-NIFA priorities for 2022 - https://www.nsf.gov/pubs/2022/nsf22502/nsf22502.pdf
  - Theme 3: AI for Climate-Smart Agriculture and Forestry
    This theme encourages the advancement of new and transformative approaches for modeling complex agricultural systems and systems interventions.
  - Proposals should clearly justify both the selection of the climate change threats to systems and the breakthroughs needed in foundational AI research necessary to make agricultural and food systems more resilient.
  - Proposals should demonstrate the potential for those foundational advances to benefit AI research more broadly through the dissemination of new knowledge (i.e., advances in methods or theory), as well as the potential for these advances to contribute to solving other challenges of such grand scale.

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The Artificial Intelligence for Future Agricultural Resilience, Management, and Sustainability Institute will serve as a nexus for multidisciplinary research teams that advance foundational AI and use these advances to address important challenges facing world agriculture. It will put strong emphasis on technologies that impact production practices, on developing a diverse technically skilled workforce in digital agriculture, and on supporting women and minority farmers.

Our research covers autonomous farming, efficiency for livestock operations, environmental resilience, soil health, and technology adoption. **Read more about our thrusts** to learn how we're advancing artificial intelligence in agriculture.

UCDAVIS UNIVERSITY OF CALIFORNIA ILLINOIS

UNIVERSITY OF CALIFORNIA Agriculture and Natural Resources

AIFS AI INSTITUTE FOR FOOD SYSTEMS

CORNELL UNIVERSITY Berkeley UNIVERSITY OF CALIFORNIA

USDA ars Agricultural Research Service

MISSION: Develop and leverage transformative AI for the ethical production and distribution of **safe, sustainable, nutritious food** with fewer resources.

https://aifs.ucdavis.edu

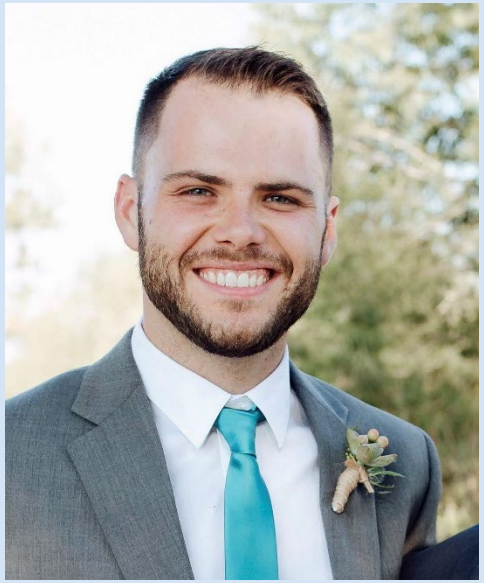
National Institute of Food and Agriculture
www.nifa.usda.gov

A1402 Agricultural Microbiomes in Plant Systems and Natural Resources

Dr. Ann Lichens-Park & Christopher Green
USDA-NIFA
Institute of Food Production and Sustainability
Division – Plant Protection

A1402 TEAM

Dr. Ann Lichens-Park
National Program Leader



Christopher Green
Lead Program Specialist

Carina (Teri) Allen
Program Specialist

How Microbiomes can Benefit Humans, Plants, and Natural Resources

- Increase crop resistance to (human and plant) pathogens
- Increase crop resistance to insect pests
- Increase crop nutrient use efficiency
- Increase crop tolerance to high temperatures and drought
- Increase carbon sequestration in agricultural systems

Apple blossoms infected with Fire Blight pathogen – Credit: George Sundin

The Time is Right for Research on Microbiome-Plant Interactions

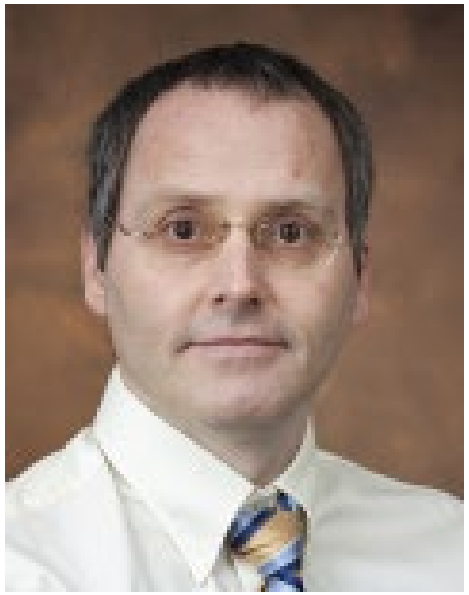
- Microbial communities benefit plants in ways that single microbial species may not
- Genomic and computational tools improve understanding of microbial communities and potential for applied benefits.
- Microbiomes can help plants adapt to climate change and increase agricultural sustainability
- Public acceptance

Other Plant and Animal Related Programs

AFRI Foundational Knowledge of Agricultural Production Systems A1102

A1102- The Team

Mat Ngouajio
NSL-Plant Systems



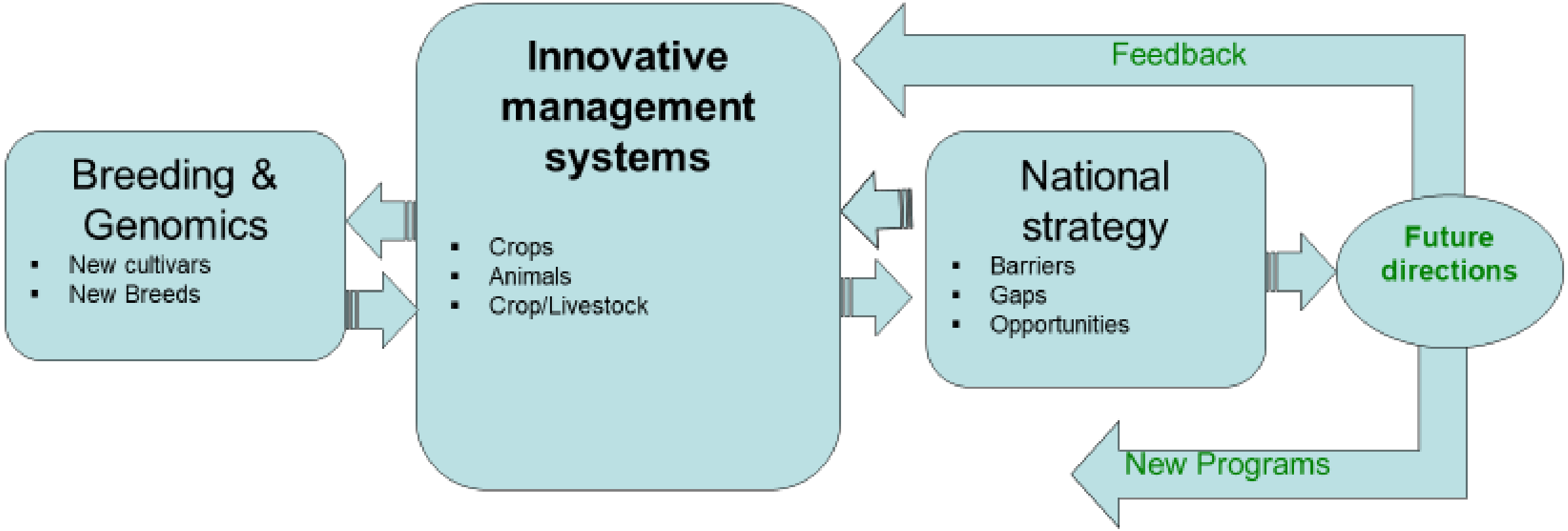
John Erickson
NPL- Plant Production

Bob Nowierski
NPL-Plant Protection

Neerja Tyagi
PS-Plant Production

Catherine Bohnert
PS-Plant Production

Proposed Packet/model



"Managing Food Security Through Crops and Livestock Management"

Program Priorities

Focus: Agricultural Production Systems across

- Rural-urban continuum
- Covers wide range from conventional open-fields to protected built environments

Specifics:

- Integration of multiple management components of agricultural production systems to
  - Enhance soil-crop-atmospheric processes
  - Resilience to various biotic and abiotic stressors
  - Improve product quality and/or productivity
- Determination of how
  - Production systems **alter the structure** of microbial communities associated with plants, soils, or other growing media
  - Different ways **alterations affect functions** such as plant nutrient uptake/utilization efficiency
  - **Resilience** to weeds, insects, diseases, weather extremes, and other **stressors that influence productivity and/or product quality**

Program Priorities

- Changes to cropping systems (including diversification or intensification), affect
  - Crop performance
  - Soil health
  - Other outcomes beneficial to system resilience
- Conduct
  - Syntheses and meta-analyses of existing data
  - Develop new or extend existing models to derive general principle
    - Function
    - Properties
    - Performance of agricultural production systems

Agricultural Genome to Phenome Initiative
AG2PI

USDA United States Department of Agriculture National Institute of Food and Agriculture www.nifa.usda.gov @USDA_NIFA
NIFA

The AG2PI Team

Ed Kaleikau
NPL

Ann Stapleton
NPL

Frank Siewerdt
NPL

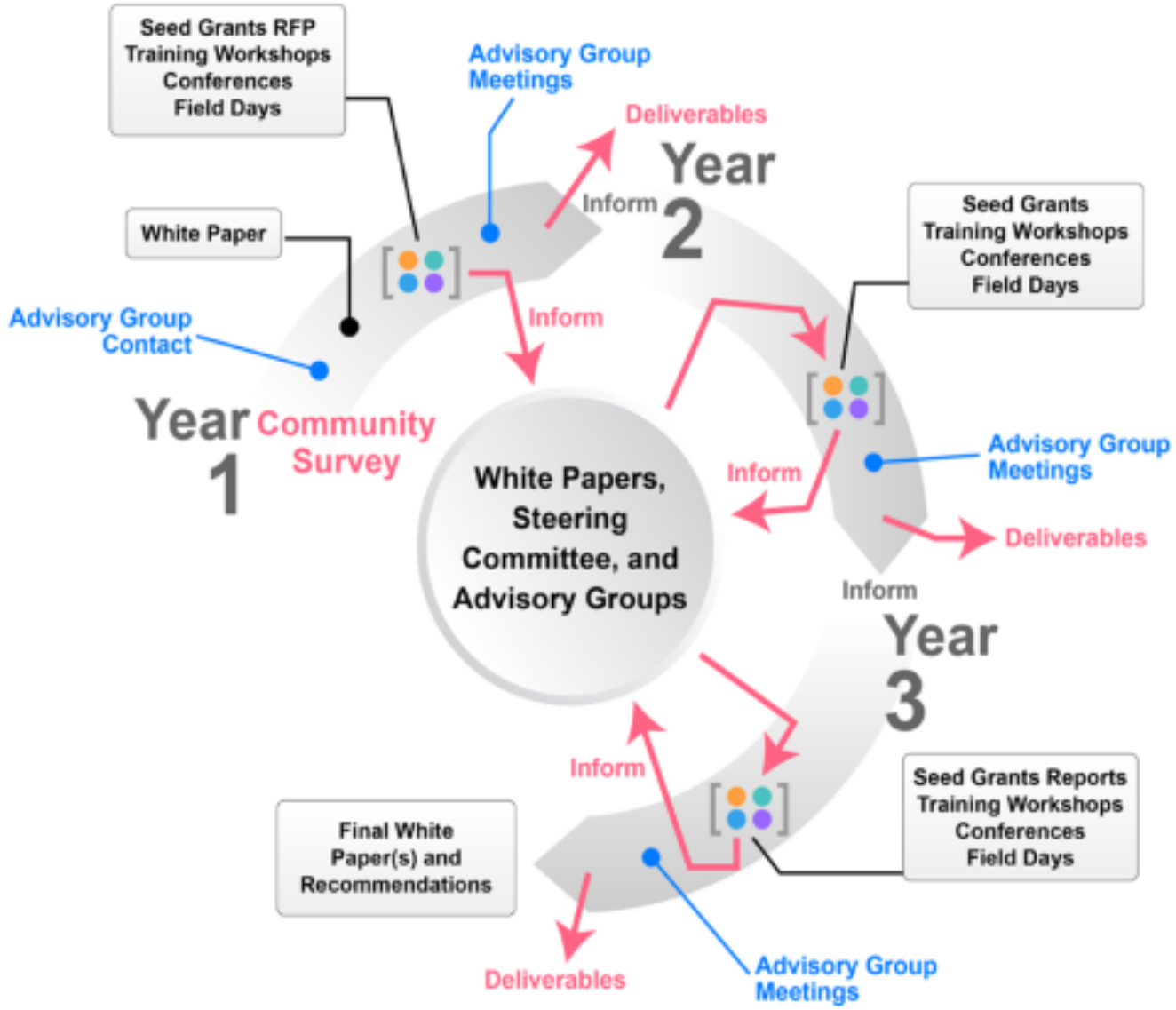
Shelby Servais
PS

Andy Funk
PS

AG2PI

Activities and Timelines

- Field Days
- Training Workshops
- Conferences
- Seed Grants



Unique Processes of Program Administration

- RFA development based off 2018 Farm Bill
- FAQ webpage – clarification for applicants with an emphasis on coordination projects
- FY 2020 Out of panel review – used ad hoc reviews – completed in 45 days!
- FY 2021 Competitive waiver ($960K) – to support the seed grant program
- FY 2021 End of year additional funding ($40K) – supplement
  - Worked with AMD/FMD to streamline the process - completed in 3 days!!

SEC. 7208. AGRICULTURAL GENOME TO PHENOME INITIATIVE.

Section 1671 of the Food, Agriculture, Conservation, and Trade Act of 1990 (7 U.S.C. 5924) is amended—

(1) in the section heading, by inserting "**TO PHENOME**" after "**GENOME**";

Diseases of Agricultural Animals (A1221)

USDA National Institute of Food and Agriculture
U.S. DEPARTMENT OF AGRICULTURE

Kathe Bjork, DVM, PhD., MPH
National Program Leader

Timothy Sullivan, PhD.
National Program Leader

Davida Vanderpuye Tengey
Primary Program Specialist

Cierrah Kassetas, M.S.
Primary Program Specialist

Bethany Krehbiel, M.S.
Secondary Program Specialist

Rekia Salter, M.S.
Secondary Program Specialist

Funding Priorities

- Cellular, molecular, genomic/genetic or whole-animal aspects of animal health and disease, with emphasis on maintaining healthy agricultural animals.
- Maintenance of homeostasis including innate immune responses.
- Disease prevention and control, including vaccines, reverse vaccinology, breeding for resistance, management, and diagnostics (for endemic diseases only).
- Therapeutic interventions for disease, including minor use animal drugs.
- Development of publicly-accessible, reasonably-priced immunological reagents for aquaculture (major focus on catfish and salmonids) or poultry.
- Establishment of a “Research Coordination Network for Minor Use Drugs.”

United States Department of Agriculture

National Institute of Food and Agriculture

INVESTING IN SCIENCE | SECURING OUR FUTURE | WWW.NIFA.USDA.GOV

Credit: aquaculturealliance.org

A1251 Program

Welfare and Well-Being of Agricultural Animals

A1251 Team

Rekia Salter
Program Specialist

Frank Siewerdt
National Program Leader

Mark Mirando
National Science Liaison

Animal Welfare and Society

Data-driven actions, policies, and decisions don’t always prevail
Emotions and perceptions matter
Irrationality and lack of objectivity
Societal pressures: boycotts
Parallel with BRAG: informed decisions!

A Delicate Balancing Act

Safeguard animal welfare and support sustainable production efficiency
Current production practices
New management approaches
Creative solutions (nutrition, genetics)
Reduced use of animals in research

A1251: Program Area Priorities

Key outcomes: health and behavior
Measures of welfare and well-being
Pain, injury and distress management
Creative solutions: nutrition, role of microbiome, genetic selection
Reduce use of animals in research

BRAG Team (2021)

John Erickson

Frank Siewerdt

Neerja Tyagi

Biotechnology Risk Assessment Grants (BRAG) Program

Program Purpose

- Supports standard research and conference project type that address biological and environmental risk assessment of genetically engineered organisms
- Assist Federal regulatory agencies to develop long-term policies
  - USDA (APHIS-BRS)
  - EPA
  - DHHS
  - FDA
- Systems
  - Plants, microorganisms, arthropods, fish, birds, livestock, and related organisms

Concerns addressed by the program

- Is there a hazard? Identification
- How likely is the hazard to occur? Probability of occurrence
- What is the severity and extent of the hazard if it occurs? Quantifying the effects
- Is there an effect beyond what might occur with an unmodified organism or an organism that has similar traits, but was developed using other technologies?

Crop Protection and Pest Management

USDA United States Department of Agriculture | National Institute of Food and Agriculture | www.nifa.usda.gov | @USDA_NIFA

NIFA

THE TEAM

Vijay Nandula
National Program Leader

Kathryn Kimble-Day
Program Specialist

Carina Teri Allen
Program Specialist

Mitzi Combs
Program Assistant

- The purpose of the CPPM program is to provide funding for integrated, multifunctional agricultural research, extension, and education activities.

- The goals and objectives of CPPM are to address high priority issues related to pests including insects, nematodes, pathogens, weeds, and other pests and their management using integrated pest management (IPM) approaches at the state, regional and national levels.

- **Applied Research and Development Program Area (ARDP)**
    - Funds applied IPM research and extension projects – annual competition; $4 million
- **Extension Implementation Program Area (EIP)**
    - Funds Extension projects for IPM Coordinators across the states and US Territories - competition every 3 years; $10 million annually
- **Regional Coordination Program Area (RCP)**
    - Funds the IPM Centers in the Western, North Central, Northeastern and Southern Regions in the US - competition every 4 yrs; $4.1 mil/yr

Emergency Citrus Disease Research and Extension Program (ECDRE) Overview

Erica Kistner-Thomas and Logan Appenfeller
USDA-NIFA
Institute of Food Production and Sustainability
Division – Plant Protection

Huanglongbing – Citrus Greening Disease

- Most severe of all citrus diseases
- Native to Asia
- Caused by phloem dwelling bacterium, *Candidatus* Liberibacter asiaticus (*C*Las)
- Disease affects most plants in citrus family
- Vectored by Asian citrus psyllid
- All infected trees die (5-8 yrs) unless treated
- Currently no cure or resistant citrus variety in US
- Devastated FL's citrus industry
  - 70% decline in production since 2005

ECDRE Team

Dr. Ann Lichens-Park
Acting Division Director of Plant Protection and Co-NPL

Dr. Erica Kistner-Thomas
Lead NPL

Logan Appenfeller
Program Specialist

Mike Fitzner
NSF Liaison, Advisor to ECDRE

- **Industry Relevancy Panel Manager: Melinda Klein (Citrus Research Board) for FY21**
- **The USDA NAREE Board: Kate Lewis**
- **The Citrus Disease Subcommittee: Industry Representatives**

ECDRE Goals and Objectives

- Bring nation's top scientists together with citrus industry representatives to find scientifically sound solutions to the devastating citrus disease, Huanglongbing (HLB)
- Transition from component-focused research to deploying research outcomes and conclusions on farms
- Encourage research teams to bring knowledge together to find grower solutions to combat and prevent HLB infection.

AFRI Tactical Sciences For Agricultural Biosecurity A1181

This program area priority focuses on increasing U.S. national capacity to prevent, rapidly detect, and respond to biological threats to U.S. agriculture and food supply. Supported activities will be aimed at increasing agricultural biosecurity at the regional and national levels, and across the public and private sectors.

–Detection and diagnostics of transboundary and emerging pests and diseases associated with animal production systems and/or emerging, re-emerging and invasive diseases, insects and weeds associated with plant production systems.

–Rapid response to, and recovery from, pests and diseases that pose large-scale biosecurity threats to plant and animal production, including existing and imminent threats to U.S. agricultural production systems.

Mitigating Antimicrobial Resistance Across the Food Chain (A1366)

Ensuring a safe, nutritious and abundant food supply while protecting responsible use of antimicrobials across the food and agriculture domain

This program area priority focuses on increasing U.S. national capacity to prevent, rapidly detect, and respond to biological threats to U.S. agriculture and food supply. Supported activities will be aimed at increasing agricultural biosecurity at the regional and national levels, and across the public and private sectors.

–Detection and diagnostics of transboundary and emerging pests and diseases associated with animal production systems and/or emerging, re-emerging and invasive diseases, insects and weeds associated with plant production systems.

–Rapid response to, and recovery from, pests and diseases that pose large-scale biosecurity threats to plant and animal production, including existing and imminent threats to U.S. agricultural production systems.

Goals of NIFA's Education Portfolio

- Improve scientific and agricultural literacy
- Recruit and train a skilled workforce to face challenges and provide needed skills
- Promote greater learning and engagement through improved formal and non-formal instruction and teacher training
- Advance science by supporting more inclusive graduate and postdoctoral training in critical research fields
- Strengthen educational capacities of MSIs in instruction, curriculum and educational infrastructure

Theme 1: Agricultural Literacy & Workforce Development

Opportunities / Challenges	NIFA Programs
• 58.0 M enrolled in K-12 • Many without farming background or experience • Many teachers and students unaware of opportunities in food and agriculture • More than 51% of undergraduates enrolled in Community Colleges	• Programs: PDAL, AWT, SPECA, WAMS, AITC • Funding: ~14 M • Priorities: Teacher development, curriculum development, recruitment, workforce training and retraining • Other: Increased focus on Community College programs and workforce development after 2017

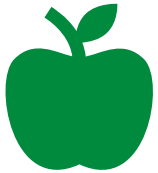
Theme 2: Improved Learning & Engagement

Opportunities / Challenges	NIFA Programs
• 17.3 M undergraduates in U.S. • Only 36,112 graduates from Agriculture and Forestry Colleges; not sufficient to fill the 59,400 job opportunities (*Purdue Study*) • Need for improved recruitment of minorities in food and agricultural sciences • Non-formal agricultural leadership programs are having growing impacts; e.g., 4H impacts 7 M youth.	• Programs: HEC, MSP, REEU, NLGCA • Funding: ~ $24 M • Priorities: Faculty development, curriculum development, experiential learning to enhance undergraduate education programs • Other: FAEIS, to collect data on faculty and students

Theme 3: Advancing Science

Opportunities / Challenges	NIFA Programs
• Science and engineering doctoral education remains dependent on non-American talent: ~40% of graduates • Producing more food and agricultural sciences doctorates is essential for NIFA to achieve its mission • Long-term impacts on training and workforce development of next generation (e.g., many NNF recipients are having major impacts)	• Programs: NNF, AFRI Pre-Doc and Post-Doc • Funding: ~ $17 M • Priorities: Education; mentoring; research, extension and education experiences. • Other: AFRI Pre- and Post-Doc funding is 3.75% of AFRI.

Agricultural Literacy & Workforce Development



AITC

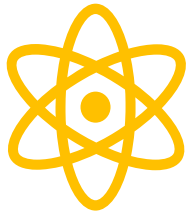
Prepares **K-12 educators to integrate information** about the food and agricultural system across curricula

- Cooperative Agreement currently with National Agriculture in the Classroom Organization
- Network of **State and local partners carry the activities**

SPECA

Strengthen secondary education and two-year postsecondary education in FANH

- Curriculum development, Faculty preparation, **fosters interaction with other institutions**
- K-14 students & faculty
- $900k appropriations total



WAMS

Increase participation of rural women and underrepresented minorities in STEM fields

- K-14 research, education, or extension
- Not BS or higher degree education supported
- $400k appropriations total

Agricultural Literacy & Workforce Development

AFRI-PDAL

Promote faculty expertise & encourage educational innovation at K-14 levels in the food and agricultural sciences

- **K-14 Teacher training focused**
- Immersive learning experiences for teachers and administrators
- No student support allowed

AFRI-AWT

Develop industry ready workforce within the food & agricultural sciences

- **Community College students**
- Hands-on training
- Students 'earn while they learn'
- Participants **must achieve industry-accepted credentials**

TERA

Recognizes and promote **excellence in teaching, extension, and research** in the food and agricultural sciences at a **college or university**

Improved Learning & Engagement

AFRI-REEU

Research and Extension based experiential learning for undergraduates

- **Hands-on research/extension activities**
- Usually summer projects, but can be year-round
- Majority of funds for participant support

HEC

Improving **baccalaureate or master**'s degrees in food and agricultural sciences, and **first professional degree**- level education in **veterinary medicine** (DVM)

- Curriculum development
- Student recruitment and support
- Faculty preparation
- Scientific instrumentation

Improved Learning & Engagement

FAEIS

Comprehensive database that **gathers information**, on a voluntary basis, from degree granting institutions of higher education on **student enrollment** in Food, Agriculture, Natural Resources, and Human Sciences

NLGCA

Supports NLGCA Institutions in **maintaining and expanding their capacity** to conduct education, research, and outreach/ extension activities relating to the FANH sciences

- Acquisition of equipment and other infrastructure
- Professional development of faculty
- Recruitment & retention of students

MSP

Encourages students from **underrepresented groups** to pursue and complete **baccalaureate** degrees in food and agricultural sciences

- **Scholarships** for recruiting, retaining, mentoring, and training of scholars
- Underrepresented: disproportionately **less than their proportion in the general population** or as indicated in standard statistical references

Advancing Science

MSP

Encourages students from **underrepresented groups** to pursue and complete D.V.M. degrees

- **Scholarships** for recruiting, engaging, retaining, mentoring, and training of scholars
- Underrepresented: disproportionately **less than their proportion in the general population** or as indicated in standard statistical references

NNF

Supports **New graduate student** training for master's and/or doctoral degree programs in **areas of specified National need**

- Institution applies to support a cohort of students
- Eligible students must be citizen or nationals of the United States and **have not completed more than one semester of their program**.

AFRI-Fellows

Prepares the next generation of research, education, and/or extension professionals

- PhD Candidates
- Postdoctoral Scholars
- **Fellow individually applies**
- **Proposals must include:**
  - Project Plan
  - Professional Development Plan
  - Mentoring Plan
  - Evaluation Plan

Program Name Acronyms

Acronym	Program Name	Program Code
AITC	Agriculture in the Classroom	AITC
SPECA	Secondary Education, Two-Year Postsecondary Education, and Agriculture in the K-12 Classroom Challenge Grants Program	SPECA
WAMS	Women and Minorities in Science, Technology, Engineering, and Mathematics Fields Program	WAMS
PDAL	Professional Development for Agricultural Literacy AFRI Priority Area	A7501
AWT	Agricultural Workforce Training AFRI Priority Area	A7601
TERA	National Food and Agricultural Sciences Teaching, Extension, and Research Awards	TEACH
REEU	Research and Extension Experiences for Undergraduates AFRI Priority Area	A7401
HEC	Higher Education Challenge Grants Program	ER
FAEIS	Food and Agriculture Education Information System	FF-L
NLGCA	Capacity Building Grants for Non-Land Grant Colleges of Agriculture Program	NLGCA
MSP	Higher Education Multicultural Scholars Program	KF
NNF	Food and Agricultural Sciences National Needs Graduate and Postgraduate Fellowship Program	KK
AFRI- Fellows	Predoctoral Fellowship Program	A7101
	Postdoctoral Fellowship Program	A7201

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Institute of Food Safety & Nutrition Non-AFRI Programs

USDA NIFA

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

Expanded Food and Nutrition Education Program (EFNEP)

FY 2021

Program Budget: ~$69M

Grantees: 76 institutions - all 1862 and 1890 Land-grant Universities

Cooperative Extension: Peer educators working in rural and urban communities

Goals

- **Reduce nutrition insecurity by assisting low-income families and youth in acquiring knowledge, skills, attitudes, and changed behaviors necessary for nutritionally sound diets and to contribute to their personal development and improvement of the total family diet and nutritional well-being**
- **Combines hands-on learning, applied science, and program data to ensure program effectiveness, efficiency, and accountability**

Audience

- **Families, youth, and children with low incomes, including parents and other caregivers with primary responsibility for feeding young children, single young adults, and children/youth in grades kindergarten through 12th grade**

Reach

- **More than 88 thousand adults and 300,000 youth and children participate annually – in all 50 states, 6 U.S. territories, and the District of Columbia. An additional 250,000 family members are reached indirectly. More than 70% of EFNEP adults are from minority populations**

Impact

- **Since 1969, EFNEP has reached more than 34 million low-income families and youth. Participants enhance their health by improving their nutrition, food safety, and physical activity practices. Annually, more than 90% of adults report improvement in food behaviors. Data from FY 2019 is summarized below. FY 2020 data is pending**

Contact: Dr. Helen Chipman, helen.chipman@usda.gov, 816-908-3124
https://nifa.usda.gov/program/expanded-food-and-nutrition-education-program-efnep
https://nifa.usda.gov/sites/default/files/resources/FY2021-Expanded-Food-and-Nutrition-Education-Program-EFNEP-RFA-508.pdf

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Gus Schumacher Nutrition Incentive Program (GusNIP)

FY 2020
Applications: 58 (26 NI & 32 PPR)
Awards: 30 (20 NI & 10 PPR)
Funding Rate: NI 77% & PPR 31%
Program Budget: $41.6M

Eligible Entities NI & PPR:
Non-profit organizations
Governmental Agencies

Cooperative Agreement:
NGO, Cooperative extension, IHE, Food System Centers, Federal, State, or Tribal Agencies

Goals

- **Conduct and evaluate projects intended to increase the purchase of fruits and vegetables by low-income consumers by providing incentives at the point of purchase**
- **Brings together stakeholders from various parts of the food and healthcare systems to foster understanding of how they might improve the health and nutrition status of participating households**

Grant Types

Nutrition Incentive (NI) Grants

Pilot Projects; $100,000 up to 1 year; 100% match
Standard Projects; $500,000 up to 4 years; 100% match
Large-Scale Projects; ≥$500,000 up to 4 years; 100% match

Produce Prescription (PPR) Grants

≤$500,000 up to 3 years; No match

Cooperative Agreements

Nutrition Incentive Program Training, Technical Assistance, Evaluation and Information Centers (NTAE), $7 million/yr continuation for 4 years; No match

Contact:
Dr. Mallory Koenings, Mallory.Koening@usda.gov, 816-908-3173
Dr. Helen Chipman, helen.chipman@usda.gov, 816-908-3124
https://nifa.usda.gov/program/gus-schumacher-nutrition-incentive-grant-program
https://nifa.usda.gov/sites/default/files/rfa/FY21-GusNIP-MOD-RFA-508.pdf

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Community Food Projects (CFP) Competitive Grants Program

FY 2020

Applications: 124

Awards: 18

Funding Rate: 15%

Program Budget: ~$4.8M

Goals

- **Fight food insecurity through developing or implementing community food projects that help promote the self-sufficiency of low-income communities**
- **Increase food security in communities by bringing the whole food system together to assess strengths, establish linkages**
- **Create sustainable food systems that improve the self-reliance of community members over their food needs**
- **Meet the food needs of individuals living under the Federal poverty line, through food distribution, outreach to increase participation in federally assisted nutrition programs, or improve access to food**
- **Promote comprehensive responses to local food access, farm, and nutrition issues**
- **Create community-led state, local, or neighborhood food and agricultural programs**
- **Include equipment necessary for the efficient operation of a project**
- **Provide innovative marketing activities; mutually benefiting agricultural producers and low-income consumers**

Grant Types

(1) Community Food Projects (CFP): $400,000 over 4 years; 100% match

(2) Planning Projects (PP): $35,000 over 3 years; 100% match

Contact: Dr. Lisa Jahns, lisa.jahns@usda.gov, (816) 820-9584
https://nifa.usda.gov/funding-opportunity/community-food-projects-cfp-competitive-grants-program
https://nifa.usda.gov/sites/default/files/rfa/FY21-CFP-MOD-RFA-508.pdf

Food and Agriculture Service Learning Program (FASLP)

FY 2020

Applications: 53

Awards: 5

Funding Rate: 9%

Program Budget: $900,000

FY2021 Budget: $1.9 M

Goals

- **Increase the knowledge of agricultural science and improve the nutritional health of children**
- **Increase the capacity for food, garden, and nutrition education within host organizations or entities, such as school cafeterias and classrooms, while fostering higher levels of community engagement between farms and school systems by bringing together stakeholders from distinct parts of the food system**
- **Increase access to school meals for children living below the Federal poverty line but also to improve the quality of these meals**

Grant Types

- **Cannot exceed $225,000 for product periods for up to 2 years**

Contact: Dr. Lisa Jahns, lisa.jahns@usda.gov, (816) 820-9584
https://nifa.usda.gov/funding-opportunity/food-and-agriculture-serving-learning-program
https://nifa.usda.gov/sites/default/files/rfa/FY2020-FY2021-FASL-RFA-20200408.pdf

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Food Safety Outreach Program (FSOP)

Joint Program between the FDA & NIFA

FY 2020

Applications: 39

Awards: 24

Funding Rate: 62%

Collaborative Engagement Supplement: $150,000

Program Budget: ~$8M

Credit: Map adapted from the Lead Center at the University of Florida

Goals

- **Maintain and continue to grow food safety and Food Safety Modernization Act (FSMA) related training, education, outreach and coordination across the FSOP, from local communities to a national audience**
- **Projects focus on the development or the expansion of food safety education and outreach programs that address the needs of a specialized audience of farmers, ranchers, food processors, and produce merchant wholesalers, whose needs previously have not been adequately addressed**

FY2021 Project Types ($9.6M Budget)

- **Community Outreach Projects: $80,000 - $150,000 over 2 years**
- **Collaborative Education & Training Projects: $200,000 - $400,000 over 3 years**
- **Regional Centers: $800,000 - $1 M over 3 years**

Contact: Dr. Helen Chipman, helen.chipman@usda.gov, 816-908-3124
https://nifa.usda.gov/food-safety-outreach-program
https://nifa.usda.gov/funding-opportunity/food-safety-outreach-program

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Small Business Innovation Research (SBIR) 8.5

Food Science and Nutrition

FY 2021 Phase I

Applications: 79

Awards: 11

Funding Rate: 14%

Program Budget: ~$7M

FY 2020 Phase II

Applications: 7

Awards: 2

Funding Rate: 29%

Program Budget: ~$2.5M

Goals

- **Increase the understanding of the physical, chemical, and biological properties of food;**
- **Improve methods for the processing and packaging of food products to improve the quality, safety and nutritional value of foods, and to reduce food waste;**
- **Develop technologies for rapid and sensitive detection of pathogens and toxins in foods; and**
- **Develop programs or products that increase the consumption of healthy foods and reduce obesity or alleviate urban and rural food deserts**

Grant Types

- **Phase I – May not exceed $100,000, or $106,500 with Technical and Business Assistance (TABA) for a period normally not to exceed eight (8) months**
- **Phase II – May not exceed $600,000 (not including TABA), with the maximum award available $650,000 (including TABA) for a period of 24 months**

Contact: Dr. Mallory Koenings, Mallory.Koening@usda.gov, 816-908-3173
https://nifa.usda.gov/program/small-business-innovation-research-program-sbir
https://nifa.usda.gov/funding-opportunity/small-business-innovation-research-program-phase-i

AFRI Food Safety and Defense A1332

Funding Priorities: Basic and applied research that will reduce the risk of intentional or unintentional contamination of foods

- Develop microbiological methods for enumerating enteric pathogens, specifically *Salmonella, Campylobacter*, and STEC, in large representative food samples designed to represent a food production lot;
- Develop microbiological procedures designed to alleviate the need for enrichment in the detection of very small numbers of pathogens in large food samples collected to represent a food production lot;
- Develop and validate advanced and innovative technologies or processes for food processing, manufacturing, packaging, and cleaning and sanitation to effectively reduce the presence of surviving enteric pathogens, including in low moisture foods and processing facilities; or
- Develop and validate novel strategies for the effective control of persistent reservoirs of foodborne pathogens

Novel Foods and Innovative Manufacturing Technologies A1364

Funding Priorities: Research that develop risk-based approaches to ensure the quality, safety and nutrition of novel foods and food ingredients, including products from pulses. This priority area also seeks to advance food manufacturing competitiveness to ensure a more sustainable, resilient and healthy food supply.

- Improve our knowledge and understanding of the chemical, physical, and biological properties of novel foods and food ingredients;
- Improve the safety, quality, shelf-life, convenience, nutrient profile or sensory attributes of novel foods and food ingredients;
- Develop innovative manufacturing technologies that increase productivity, improve food quality and/or nutritional value of foods and food ingredients that are more energy, water and resource efficient; or
- Advance sciences and develop technologies to improve shelf life and minimize food waste and loss throughout the food supply chain including consumer empowering tools.

Food and Human Health A1343

Program Area Priority:

Investigate the nutrients and contaminants in food and their impact on the gut microbiota

- Enhance the nutritional value of foods through **improved bioavailability of vitamins, minerals, and bioactive components and improved absorption** of vitamins, minerals, and bioactive components including nanoscale delivery;
- Investigate the **multi-directional impact of food composition and structure** (including micro- and nano-structures) on **human gut health** (i.e., nutrient absorption rates, secondary metabolites, pathogen interaction, physiological indications, sensory signaling, etc.) **to assess the safety, quality, and nutritional value of foods**; and/or
- Investigate the role of the **food components or contaminants on the human gut microbiome and its metabolites**, and the subsequent impact on human health.

Diet, Nutrition and the Prevention of Chronic Diseases A1344

Funding Priorities:

- Develop, implement, and evaluate innovative research, educational, and outreach strategies *to improve eating patterns that support the prevention of chronic disease*;
- Investigate, assess, and recommend food and nutrition research and program interventions with the goal *to improve and sustain health;* or
- *Improve food security and nutritional health outcomes for low-income people* through an evidence-based approach to healthy eating and active living lifestyle programs, thereby supporting a pathway to self-sufficiency.

Overview of AFRI Bioenergy, Natural Resources and Environment in the Institute of Bioenergy, Climate and Environment

AFRI Bioenergy, Natural Resources and Environment (BNRE)

Program Area Priorities:

- A1401 Soil Health
- A1411 Water Quantity and Quality
- A1414 Sustainable Bioeconomy through Biobased Products
- A1451 Sustainable Agroecosystems: Health, Functions, Processes and Management

Soil Health A1401

Funding Priorities: Basic and applied research that will lead to the development of tools, practices, techniques and/or innovations for improving soil health and the resilience and sustainability of agricultural production systems and ecosystem services.

- Foundational and applied research to advance scientific understanding of soil physical and biogeochemical processes and interactions;
- The assessment, development and adoption of models, decision support tools and new management/conservation practices and/or processes that will lead to improving or maintaining soil health and productivity while maintaining or improving environmental health and sustainability of our natural resource base;
- A focus on the interactions between the social and human dimensions with environmental and economic dimensions is encouraged. Proposed projects that are primarily fundamental science must explain how a better understanding of the fundamental processes will lead to strategies to improve overall soil health and the resilience and sustainability of agricultural production systems and ecosystem services.

Water Quantity and Quality A1411

Funding Priorities: Reduce the freshwater demand (both groundwater and surface water) for irrigation and the nutrient demand for maximum crop production

- Reduction of the use of freshwater and improve agricultural resilience/sustainability by innovative approaches, tools and technologies.
- Evaluation of the physical and biogeochemical interactions, fluxes, fate and transport, transformation, and storage of single or multiple nutrients, pathogens or chemicals of environmental concern (CEC) of a variety of sources as it relates to agroecosystem productivity and on associated natural resources and environment.
- Mitigation of soil salinity from the use of lower quality water sources in agriculture.
- Conservation of surface and groundwater quantity through research of agroecosystems.
- Mitigation and/or measurement of soil erodibility and erosion to sustain agroecosystems.

Sustainable Bioeconomy through Biobased Products A1414

Funding Priorities: The development of bio-based products can complement existing agricultural production systems and industrialized processes by creating opportunities to improve overall system profitability and productivity

- New and/or improved strategies to develop bio-based products that improve product functionality, increase potential revenues and/or reduce cost over incumbent products;
- Strategies and approaches for scalable biomass systems that provide beneficial ecosystem services, such as improved water availability and quality, improved life cycle emissions, nutrient use reduction, or wildlife and pollinator habitat enhancements;
- Strategies to alleviate technical, and economic barriers leading to adoption, resulting in improved consumer attitudes toward the bioeconomy and strengthening the rural economy through development of new bioproducts and employment opportunities.

Sustainable Agroecosystems: Health, Functions, Processes and Management A1451

Funding Priorities: We focus on improvement of ecosystem health and productivity in managed systems (croplands, forests, grasslands and rangelands) that are currently under stress and at risk from variable climates, pests, pathogens, invasive plants, and increased environmental pressures.

- Foundational and/or applied research to advance scientific understanding of processes and interactions, and/or
- The assessment and development of new management or conservation practices with a focus on ecosystem services and/or processes. The project should lead to substantial improvements in ecosystem services in extensively managed and agricultural systems by addressing the impacts of changes in management practices on croplands, forest, grasslands, and rangelands at local and landscape scales.

Non-AFRI Programs of Interest Related to BNRE

- Renewable Resources Extension Act National Focus Funds (RREA-NFF)
- Small Business Innovation Research (SBIR) 8.4 Conservation of Natural Resources

Specialty Crops (SCRI)

- Specialty crops are defined in law as fruits and vegetables, tree nuts, dried fruits, and horticulture and nursery crops, including floriculture.
- The intent of the Specialty Crop Research Initiative (SCRI) is to promote collaboration, open communication, the exchange of information, and the development of resources that accelerate application of scientific discovery and technology to solving needs of the various specialty crop industries.
- SCRI will give priority to projects that are multistate, multi-institutional, or trans-disciplinary, and include explicit mechanisms to communicate results to producers and the public.

Legislative Focus Area Priorities

- Research in plant breeding, genetics, genomics, and other methods to improve crop characteristics. Efforts to identify and address threats from pests and diseases, including threats to specialty crop pollinators;
- Efforts to improve production efficiency, handling and processing, productivity, and profitability over the long term (including specialty crop policy and marketing);
- New innovations and technology, including improved mechanization and technologies that delay or inhibit ripening;
- Methods to prevent, detect, monitor, control, and respond to potential food safety hazards in the production efficiency, handling and processing of specialty crops, including fresh produce.

What to Do If You Have Questions?

Consult the RFA

and

contact the

Program Staff!!!