



United States
Department of
Agriculture

National Institute
of Food
and Agriculture

www.nifa.usda.gov
[@USDA_NIFA](https://twitter.com/USDA_NIFA)

Stakeholders Shape NIFA's Science Directions

Ed Kaleikau

National Program Leader

Plant Breeding Genetics and Genomics



USDA NIFA

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

National Institute of Food and Agriculture

- USDA's extramural funding agency, about \$1.75B budget.
- Supports Land-Grant Universities, and other universities, and Federal labs (ARS) and other organizations.
- Provides leadership and funding for programs that advance agriculture-related sciences.

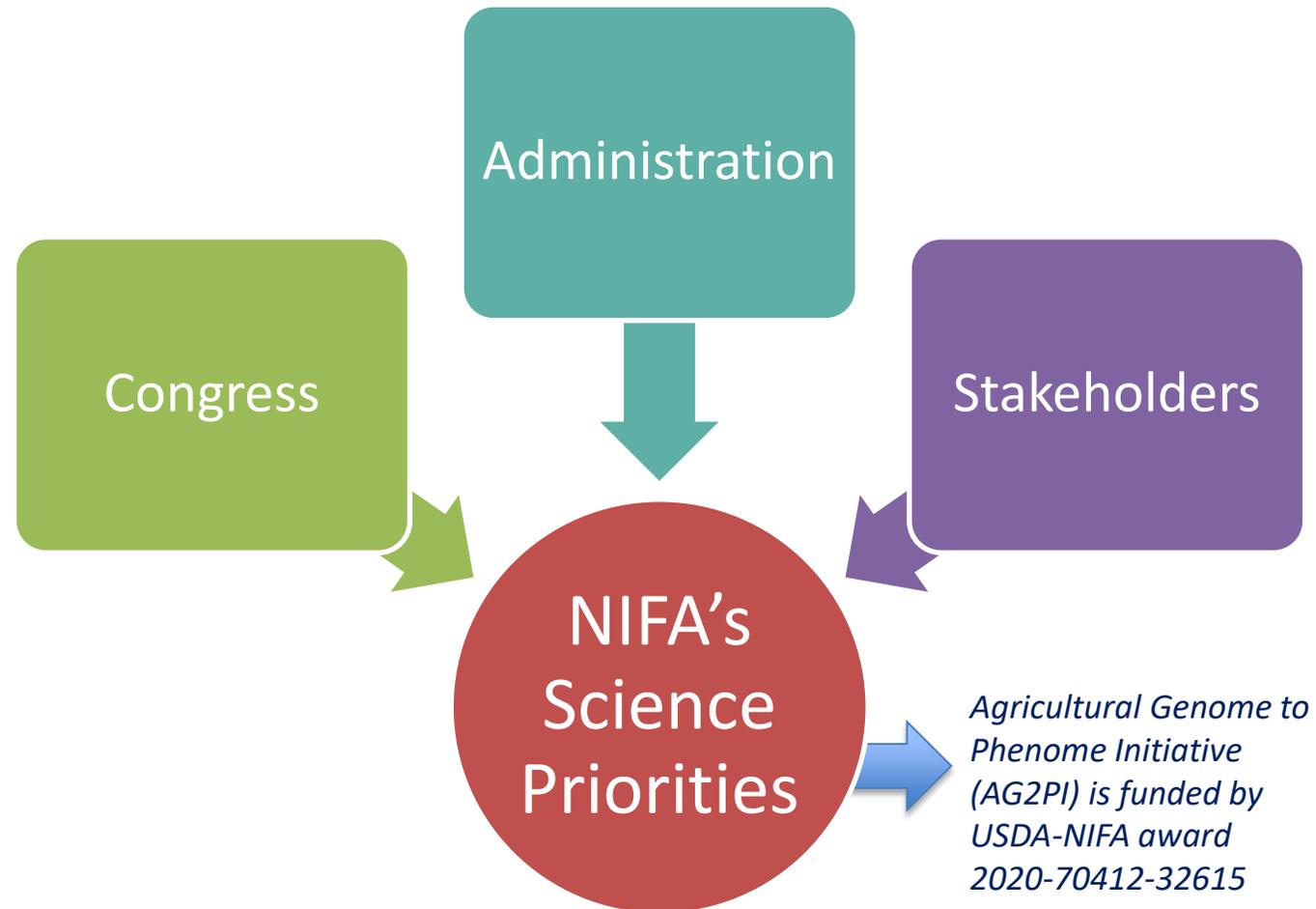


Washington DC



Kansas City MO

Key Drivers for NIFA's Science



AG2PI: Creating a Shared Vision Across Crop & Livestock Communities

(this is not a research project)

Overall Goal: to assemble a cross-kingdom, transdisciplinary community and prepare this community for an anticipated large-scale R&D effort in AG2P

Objectives:

- Develop a community vision for AG2P research
- Identify (shared) research needs, opportunities, & gaps
- Support seed projects to *outline community solutions* to research challenges
- Communicate and disseminate our findings to the research community and the USDA



Stakeholders Shape NIFA's Science Directions

2018 NIFA FACT Workshop

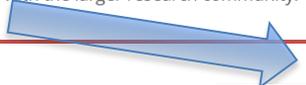
High Throughput, Field-Based Phenotyping Technologies for the Genomes to Fields (G2F) Initiative

January 28-30, 2018 | The Gateway Hotel & Conference Center, Ames, Iowa

[Download Meeting Agenda](#)

With funding provided by a USDA NIFA FACT conference grant, Iowa State University is hosting this workshop that will bring together data generators, engineers, computational scientists, industry scientists, and graduate students. The workshop will expose the field-based G2F data generators, many of whom are new to the field, to a variety of novel tools and approaches for data analysis, as well as best practices for sharing G2F data with the larger research community.

Workshop



RFA

Agriculture and Food Research Initiative Competitive Grants Program

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



ACCESSION-NO: 1022368 [Full-Record]
PROJ-NO: IOW05612 AGENCY: NIFA-IOW
PROJ-TYPE: AFRI-COMPETITIVE-GRANT PROJ-STATUS: NEW
CONTRACT/GRANT/AGREEMENT-NO: 2020-68013-30934 PROPOSAL-NO: 2019-05478
START: 01-JUN-2020 TERM: 31-MAY-2023
GRANT-AMT: \$2,900,000 GRANT-YR: 2020
AWARD-TOTAL: \$2,900,000
INITIAL-AWARD-YEAR: 2020

INVESTIGATOR: Schnable, P.S.; Castellano, M.J.; Dong, L.; Ganapathysubramanian, B.; Dill, C.A.; JO

PERFORMING-INSTITUTION: IOWA-STATE-UNIVERSITY 2229-Lincoln-Way AMES, IOWA-50011

HIGH-INTENSITY-PHENOTYPING-SITES: A-MULTI-SCALE, MULTI-MODAL SENSING-AND-SENSE-MAKING-CYBER-ECOSYSTEM-FOR-GENOMES-TO-FIELDS

High Intensity Phenotyping Sites

05467
START: 01-SEP-2020 TERM: 31-AUG-2023
GRANT-AMT: \$3,000,000 GRANT-YR: 2020
AWARD-TOTAL: \$3,000,000
INITIAL-AWARD-YEAR: 2020

INVESTIGATOR: Ge, Y.; Thomasson, J.O.; Baenziger, P.; Murray, S.; Ibrahim, A.M.; Schnable, J.A.; Sandall, L.E.; Shi, Y.E.; Bai, G.; Belamkar, V.; El-Basov, I.B.; SA

PERFORMING-INSTITUTION: UNIVERSITY-OF-NEBRASKA LINCOLN, NEBRASKA-68583

HIGH-INTENSITY-PHENOTYPING-SITES:

NON-TECHNICAL-SUMMARY: The overall goal of this project is to establish two complementary high-intensity phenotyping sites at University of Nebraska-Lincoln (UNL) and Texas A&M University at College Station, TX (TAMU), focusing on maize and wheat. Our four specific objectives are: (1) Support two ongoing community-based plant phenotyping efforts at both UNL and TAMU; namely, the maize Genomes to Fields Initiative (G2F) and the winter wheat breeding programs; (2) Advance and apply Unmanned Aerial Vehicles (UAVs) as our main platform for sensor deployment and data



Stakeholders Shape NIFA's Science Directions

ACCESSION-NO: 1018227 **SUBFILE:** CRIS
PROJ-NO: CA-D-PLS-2500-CG **AGENCY:** NIFA-CALB
PROJ-TYPE: AFRI-COMPETITIVE-GRANT **PROJ-STATUS:** TERMINATED
CONTRACT/GRANT/AGREEMENT-NO: 2019-67013-29005 **PROPOSAL-NO:** 2018-06266
START: 01-JAN-2019 **TERM:** 31-DEC-2019
GRANT-AMT: \$33,000 **GRANT-YR:** 2019
AWARD-TOTAL: \$33,000
INITIAL AWARD YEAR: 2019

Workshop

alotto, M.; Van Deynze, AL.; Jay-Russell, MI, . . .

PERFORMING-INSTITUTION:
 UNIVERSITY OF CALIFORNIA, DAVIS
 410 MRAK HALL
 DAVIS, CALIFORNIA 95616-8671

BREEDING CROPS FOR ENHANCED FOOD

NON-TECHNICAL SUMMARY: The demand for food is expected to increase as the human population is expected to increase and increasing urbanization. Healthy eating of fresh produce is an integrated strategy to decrease the risk of several foodborne illnesses in the United States are expected to increase each year and 51% has been attributed to plant

RFA

Agriculture and Food Research Initiative
 Competitive Grants Program

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

Plant Breeding for
 Enhancing Food Safety



United States
Department of
Agriculture

National Institute
of Food
and Agriculture

www.nifa.usda.gov
@USDA_NIFA

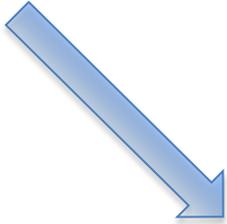
NIFA

Stakeholders Shape NIFA's Science Directions



Commodity Board Topics

National Peanut Board



Agriculture and Food Research Initiative Competitive Grants Program

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

Source: AUBURN UNIVERSITY submitted to

DISSECTION AND EXPLOITATION OF GENE NETWORKS TO IMPROVE PEANUT YIELD UNDER DROUGHT

Sponsoring Institution	National Institute of Food and Agriculture	Project Status	NEW
Reporting Frequency	Annual	Funding Source	AFRI COMPETITIVE GRANT
Grant No.	2020-67013-32164	Accession No.	1023392
Proposal No.	2019-05471	Project No.	ALA012-4-19088
Program Code	A1141	Multistate No.	(N/A)
Project End Date	Aug 31, 2023	Project Start Date	Sep 1, 2020
		Grant Year	2020

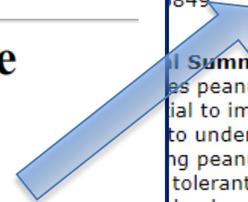
Project Director

Organization
UNIVERSITY
SMITH HALL
849

Performing Department
College of Agriculture

Summary

... peanut yield by greater than \$50M annually. Despite the current crop losses to drought, there is potential to improve peanut yield under limited soil moisture and prolonged drought conditions -- we need to understand that tremendous heritable variation exists in both drought-responsive physiology among peanut cultivars. Here we propose to develop molecular targets that will enhance efforts to identify tolerant peanut varieties through an integrated test of molecular and physiological responses to drought. ... we will not only dissect the genetic basis of improved yield in dry conditions, but also



Breeding Hubs to Stack Desirable Traits into Elite Cultivars

Desired Traits



Trait validation

Precision phenotyping

Pre-breeding

Field evaluation in relevant environments

Distribution of novel higher yielding germplasm



Elite Cultivars



Research to Deliver Wheat for the Future

International
Wheat Yield
Partnership

KANSAS STATE
UNIVERSITY
College of Agriculture

Kansas Wheat Commission
Kansas Department of Agriculture
Kansas Wheat Alliance
Heartland Plant Innovations
Colorado Wheat Administrative Committee
Nebraska Wheat Board
Oklahoma Wheat Commission
Texas Wheat Producers Board, National
Association of Wheat Growers

BASF
Syngenta
Corteva Agriscience
KWS
Limagrain

U.S. winter wheat public-breeding
programs



Agricultural Genome to Phenome Initiative (AG2PI)

Key Messages

- Fosters a transdisciplinary community of researchers as a foundation for improving the efficiency and resilience of U.S. agriculture.
- Accelerates development of a “genome to phenome” infrastructure for scientific collaboration.
- Provides opportunity for the G2P community to present recommendations to support new frontiers or new areas of collaborative science that are under funded and could be incorporated in RFAs and moved forward.



United States
Department of
Agriculture

National Institute
of Food
and Agriculture

www.nifa.usda.gov
[@USDA_NIFA](https://twitter.com/USDA_NIFA)

Thank you.

Edward.Kaleikau@usda.gov

USDA **NIFA**

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE