



National Institute of Food and Agriculture

U.S. DEPARTMENT OF AGRICULTURE

BIOENERGY, CLIMATE, AND ENVIRONMENT
FOOD PRODUCTION AND SUSTAINABILITY
YOUTH, FAMILY, AND COMMUNITY
FOOD SAFETY AND NUTRITION
INTERNATIONAL PROGRAMS

NIFA

Frontiers in Agricultural Biotechnology

Agricultural Outlook Forum

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

USDA IS AN EQUAL OPPORTUNITY PROVIDER, EMPLOYER, AND LENDER



NIFA

- NIFA is the extramural science funding agency of USDA's REE mission area
- NIFA awards research funding through a combination of competitive grants and funds allocated to states under statutory formulas
- Mission: Provide leadership and funding for programs that advance agriculture-related sciences. We invest in and support initiatives that ensure the long-term viability of agriculture. NIFA applies an integrated approach to ensure that groundbreaking discoveries reach the people who can put them into practice.



What is Biotechnology

- Biotechnology – Using living organisms or biological materials to develop improved plants, animals, or microorganisms, or to make or modify products or processes.
- Agricultural Biotechnology – A broad term for using biotechnology to create or change traits in plants, animals, or microorganisms in food and agriculture.
- Biobased Products – Commercial or industrial products, including intermediate ingredients or feedstocks, that are composed of biomass.



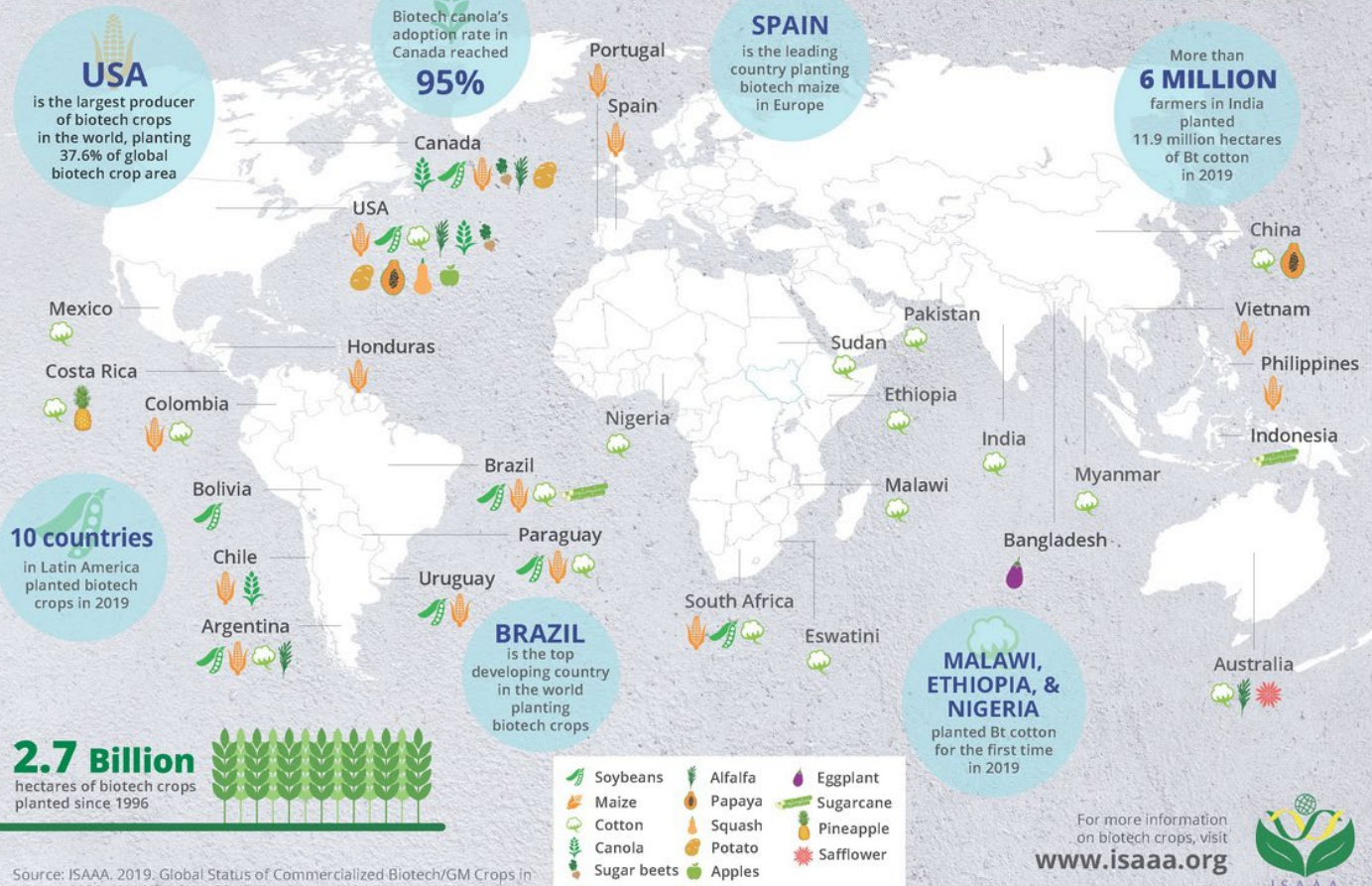
Do you know where biotech crops are grown?

More than 30 countries have planted biotech crops since 1996. See where they were grown in 2019.



17 MILLION

small, resource-poor farmers and their families totaling >65 million people benefited from biotech crops in 2019



Source: ISAAA. 2019. Global Status of Commercialized Biotech/GM Crops in 2019. ISAAA Brief No. 55. ISAAA: Ithaca, NY.

For more information on biotech crops, visit www.isaaa.org



NIFA Programs

- Over 80 competitive Requests for Applications (RFAs) in any given fiscal year
 - Agriculture and Food Research Initiative (AFRI)
 - Biotechnology Risk Assessment Grants (BRAG) Research Program
 - Specialty Crop Research Initiative (SCRI)
 - Bioproduct Pilot Program
 - NEXTGEN Program



Agriculture and Food Research Initiative

- Estimated funding: \$445,000,000 (FY22)
- NIFA's AFRI funding portfolio includes both single- and multi-function research, education, and extension grants that address key problems of national, regional, and multi-state importance. AFRI-funded projects sustain all components of agriculture, including biotechnology. These projects also create jobs and help develop the next generation of agriculture and food scientists:
 - Foundational and Applied Science (FAS) RFA
 - Sustainable Agricultural Systems (SAS) RFA
 - Education and Workforce Development (EWD) RFA



Agriculture and Food Research Initiative

- Program project examples:
 - Tufts University for biotechnology, LCA, and consumer acceptance of cell-based alternative proteins
 - University of Maryland for enabling efficient transgene-free precise gene editing in carrot
 - University of California for multiplexed gene editing in livestock embryonic stem cells



Biotechnology Risk Assessment Grants

- The purpose of the Biotechnology Risk Assessment Research Grants Program (BRAG) program is to support the generation of new information that will assist EPA, FDA, and USDA regulatory agencies in making science-based decisions about the effects of introducing into the environment GE organisms
- Funded by ARS, FS, & NIFA; Administered by NIFA & ARS
- Estimated Budget: \$5,500,000
- Program focus areas:
 - Management Practices to Minimize Environmental Risk of GE Organisms
 - Methods to Monitor and Understand the Dispersal of GE Organisms
 - Gene Transfer between Genetically Engineered Animals, Plants, and Microorganisms and Related Wild and Agricultural Organisms
 - Environmental Effects of GE relative to Non-GE Organisms in the Context of Production Systems



Biotechnology Risk Assessment Grants

Program project examples:

- University of California for comparative evaluation of the phenotype, genome, and animal products derived from offspring of a genome edited hornless bull
- Washington University for development of kill switches for biocontainment of GE microorganisms
- North Carolina State University for assessing the influence of genetic background on the efficacy of gene drive strains of spotted wing fruit fly



Specialty Crops Research Initiative

- Estimated FY23 Budget: \$80,000,000
- Program focus areas:
 - 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)



Specialty Crops Research Initiative

- Program focus areas (cont.):
 - 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



Specialty Crops Research Initiative

- Program project examples:
 - University of Minnesota for completing the grapevine powdery mildew resistance pipeline: from genes to sticks in the ground
 - New Mexico State University for development of genetic resources to accelerate breeding of climate adapted pecan trees



Bioproduct Pilot Program

- Authorized and funded by the Infrastructure Investment and Jobs Act
- Estimated FY22/23 Budget: \$9,500,000
- In collaboration with USDA Rural Development's BioPreferred program, this Program focused on the benefits of bioproducts in relation to their commonly used alternative materials, including:
 - Cost savings
 - Greenhouse gas emission reductions
 - Lifecycle and longevity characteristics



Bioproduct Pilot Program

- Program project examples:
 - Virginia Tech University, for a project that proposes to convert food waste into biodegradable, polyhydroxy-alkanoate (PHA)-based bioplastics
 - University of Illinois, for a project that proposes to convert swine manure and other organic feedstocks into biobinders for asphalt that increase the quality of recycled asphalt pavements
 - Soylei Innovations, of Ames, Iowa, for a project that proposes to transform high oleic soybean oil into thermoplastic rubber for pavements



NEXTGEN Program

- Program goal: Enable 1890 institutions, 1994 institutions, Alaska Native-serving institutions and Native Hawaiian-serving institutions, Hispanic-serving institutions and insular area institutions of higher education located in the U.S. territories to build and sustain the next generation of the food, agriculture, natural resources, and human sciences (FANH) workforce including the future USDA workforce



NEXTGEN Program

- This program is supported by funds provided through the American Rescue Plan Act
- Estimated Funding: \$250,000,000
- Project types:
 - Student Scholarship Projects
 - Experiential Learning Projects
 - Outreach and Engagement Projects



Summary

- USDA is proud to drive scientific innovation with research and data that address agricultural issues that impact Americans from the field to plates
- We are excited to announce that USDA will release its new Science and Research Strategy this coming Spring...stay tuned
- This forward-looking Strategy will set priorities and drive solutions that matter to all Americans



Summary

- By bolstering agricultural innovation with a keen focus on delivering solutions to everyday people, we have an opportunity to transform our nation's food systems in real and meaningful ways that impact all Americans
- Questions?



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