BRS Annual Stakeholder Meeting

Jessica Mahalingappa
Associate Deputy Administrator
Animal and Plant Health Inspection Service (APHIS)
Biotechnology Regulatory Services (BRS)

December 8, 2022

Welcome and Introduction of Chief of Staff for Marketing and Regulatory Programs

Mike Watson
APHIS Associate Administrator

Agenda Overview

Janice Strachan
Biotechnologist
Plant Evaluation Branch,
Biotechnology Risk Analysis Programs

Agenda

- **Biotechnology/Bioeconomy Executive Order**
- Confirmation Requests
- Regulatory Status Review Process
- Q&A Session
- Break
- Permits Update
- Microbes Update
- Compliance Inspections Update
- International Engagement
- Q&A Session
- Final Remarks and Adjournment

Executive Order on the U.S. Bioeconomy

Anastasia Bodnar
Agricultural Biotechnology Advisor
Biotechnology Coordinator for USDA
Acting Bioeconomy Coordinator for USDA

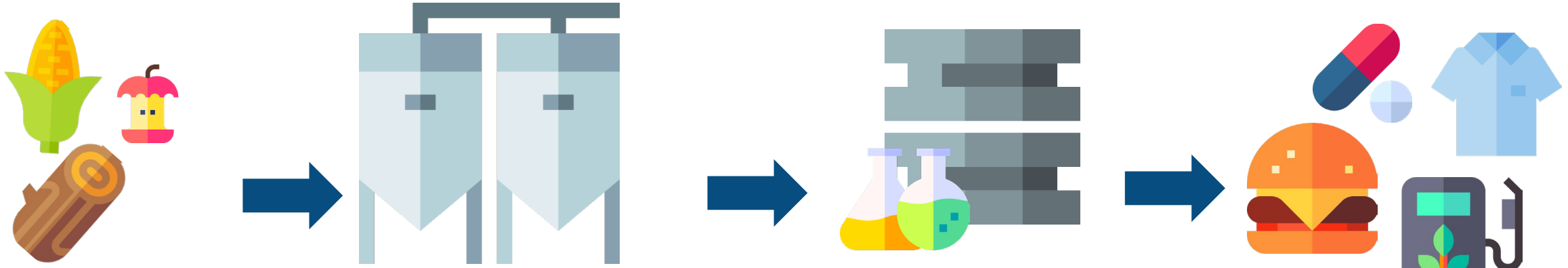
SEPTEMBER 12, 2022

Executive Order on Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy

By the authority vested in me as President by the Constitution and the laws of the United States of America, it is hereby ordered as follows:

Terms in the Bioeconomy EO

- **Bioeconomy**: economic activity derived from the life sciences
- **Biotechnology**: technology enabled by life sciences innovation
- **Biomanufacturing**: using biological systems to develop products



Starches, sugars
Waste products

Biological or chemical transformation

Intermediates (chemicals, materials)

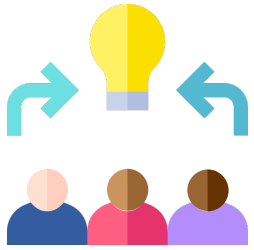
Products (food, clothes, fuel, medicine, and more)

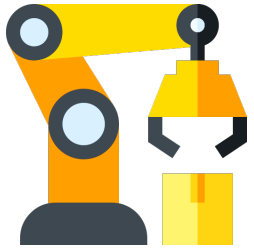
Icons by Flaticon, figure adapted from Schmidt Futures

USDA and the Bioeconomy EO

- Support the “National Biotechnology and Biomanufacturing Initiative”

  - Improve **food security**
  - Strengthen **supply chains**
  - Reduce impacts of **climate change**
  - **Create jobs** across America





“Invent it here, grow it here, make it here”

EO Sec. 3. Biotechnology and Biomanufacturing for Societal Goals

- Report on biotechnology and biomanufacturing research and development in food and agriculture
  - Improve sustainability, food quality, and nutrition
  - Protect against pests and diseases
  - Cultivate alternative food sources
- USDA is supporting reports on health, climate, supply chains, and cross-cutting research and development

EO Sec. 5. Building a Vibrant Domestic Biomanufacturing Ecosystem

- Plan for U.S. biomass supply chains for domestic biomanufacturing and biobased product manufacturing
  - Programs to encourage climate-smart production and use of domestic biomass
  - Advance food security, sustainability, and needs of underserved communities

EO Sec. 6. Biobased Products Procurement

- Federal efforts to increase domestic production of biobased products
  - Train federal purchasing staff
  - Publish value of federal biobased product procurement
  - Identify opportunities for new categories of biobased products
  - Agencies strive to increase biobased product procurement by 2025

EO Sec. 8. Biotechnology Regulation Clarity and Efficiency

- USDA, EPA, and FDA are co-leading efforts toward regulatory clarity and efficiency
  - Identify areas of ambiguity, gaps, or uncertainties in the Coordinated Framework for Regulation of Biotechnology
  - Provide plain-language information on roles, responsibilities & processes of each regulatory agency
  - Identify regulations and guidance documents that can be created, updated, streamlined, or clarified

Additional EO Activities that USDA Supports

- Sec. 4 – "Data for the Bioeconomy Initiative" to identify data types and sources needed to advance bioeconomy-related R&D
- Sec. 7 – Plan for training and education; expanded career pathways into biotechnology and biomanufacturing
- Sec. 9 – "Biosafety and Biosecurity Innovation Initiative" to encourage best practices
- Sec. 10 – Plan to measure the bioeconomy; common federal bioeconomy lexicon
- Sec. 11 – Plan for securing the bioeconomy; assess and mitigate vulnerabilities of the bioeconomy
- Sec. 12 – International engagement plan; working with foreign partners, organizations, and nongovernmental entities to grow the global bioeconomy

Seeking Stakeholder Insights

- Completed five White House-led industry listening sessions on food/ag, health, climate, supply chains, and cross-cutting research
- Expected two Requests for Information (RFIs) in December 2022
- Potential virtual public stakeholder listening sessions in January 2023
- Topics of interest include:
  - Specific short- and long-term **bold goals** in food and agriculture that can be achieved with biotechnology and biomanufacturing
  - How the federal government can work with public and private sectors to achieve these bold goals
  - Successes and activities that accelerate bioeconomy innovation
  - Challenges and opportunities to enhance innovation

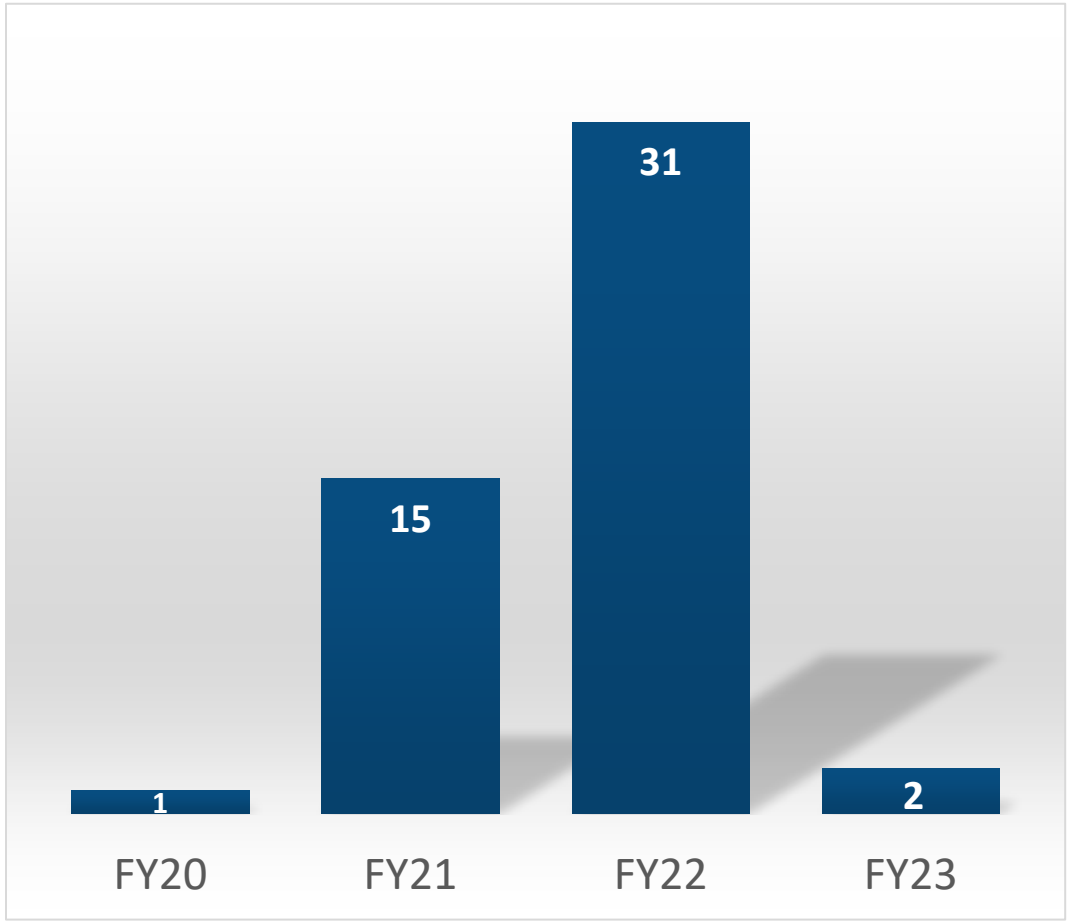
Agenda

- **Confirmation Requests**
- Regulatory Status Review Process
- Q&A Session
- Break
- Permits Update
- Microbes Update
- Compliance Inspections Update
- International Engagement
- Q&A Session
- Final Remarks and Adjournment

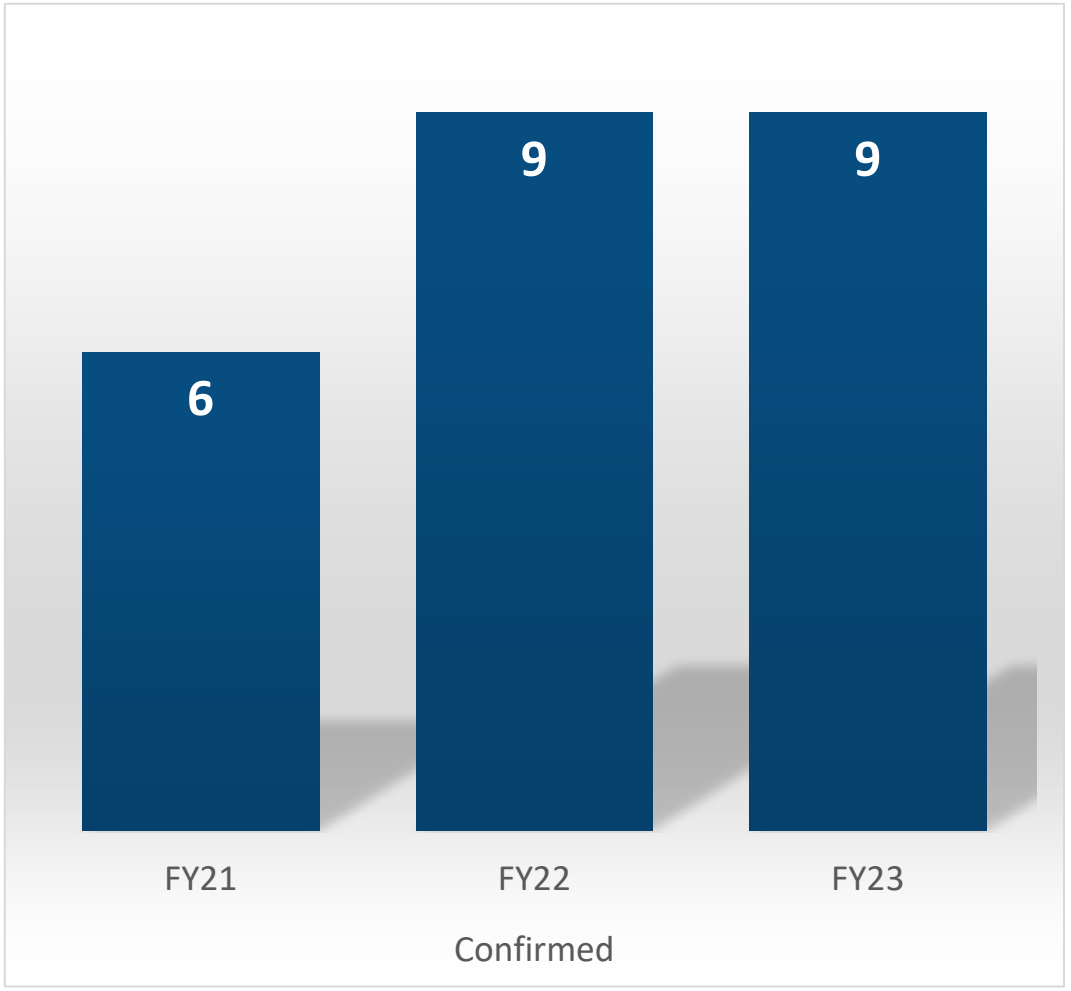
Requests for Confirmation of Exemption from 7 CFR part 340 Update

Michael Stulberg
Senior Biological Scientist
Biotechnology Risk Analysis Programs
Biotechnology Regulatory Services (BRS)

Confirmation of Exemption Requests Received



■ Confirmation of Exemption Requests Confirmed

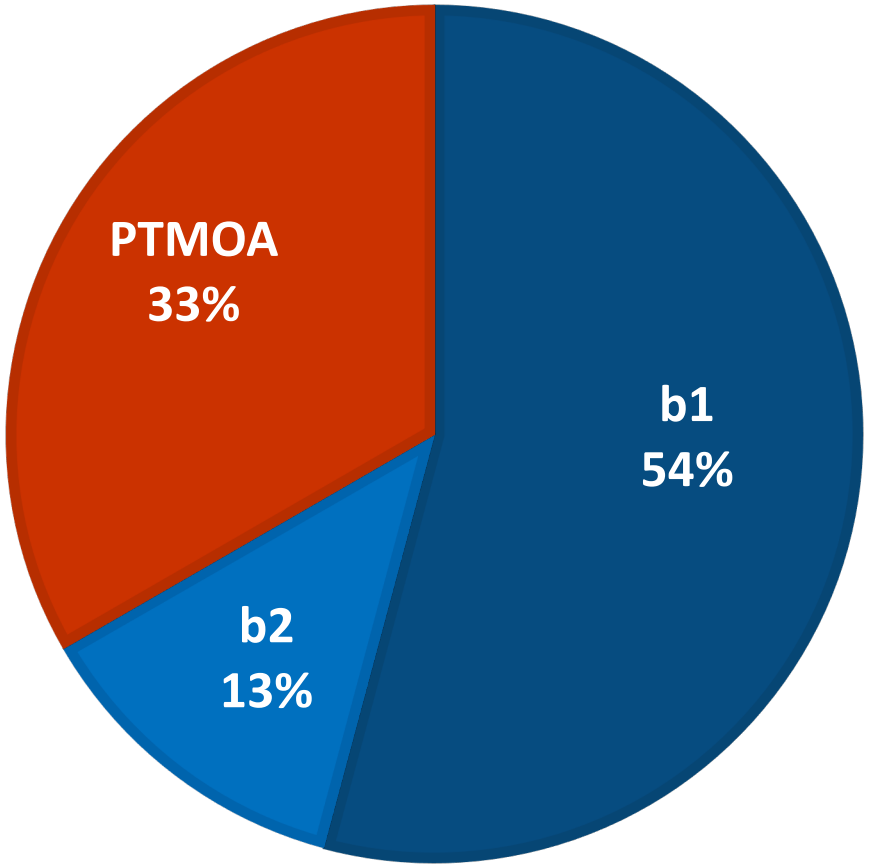


As of November 7, 2022

Exemptions to 7 CFR part 340

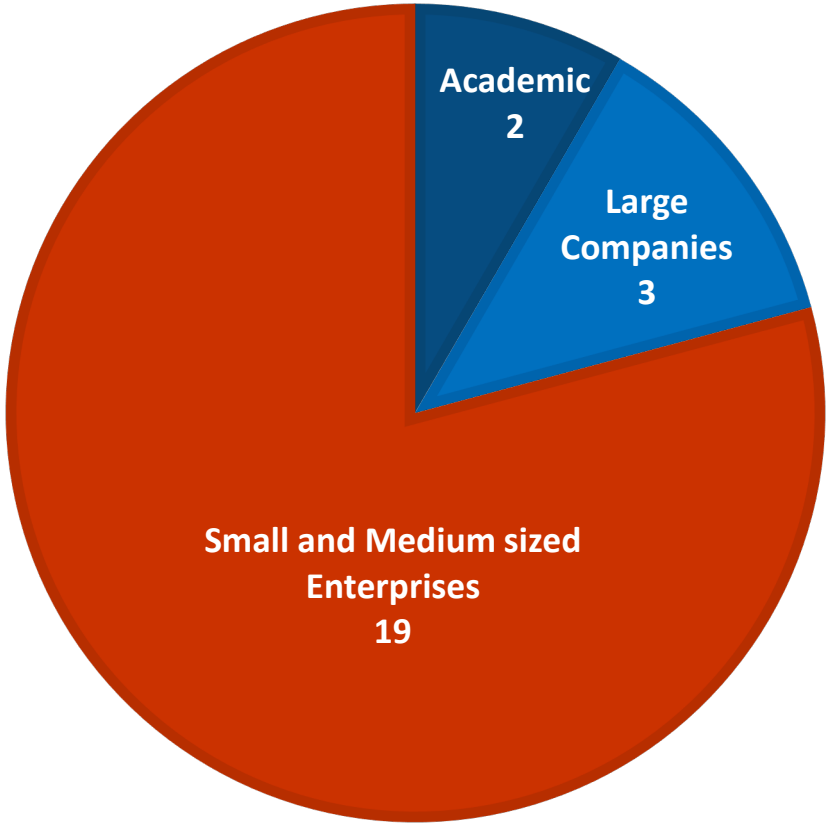
- Single genetic modification that:
  - b1 – is a change resulting from cellular repair of a targeted DNA break in the absence of an externally provided repair template
  - b2 – is a targeted single base pair substitution
  - b3 – introduces a gene known to occur in the plant's gene pool, or makes changes in the targeted sequence to correspond to a known allele of such a gene or to a known structural variation present in the gene pool
- Has the same plant-trait-mechanism of action combination that has previously undergone analysis by APHIS and determined not to be regulated under 7 CFR part 340 (petition or RSR)

- Types of Confirmed Exemption Requests

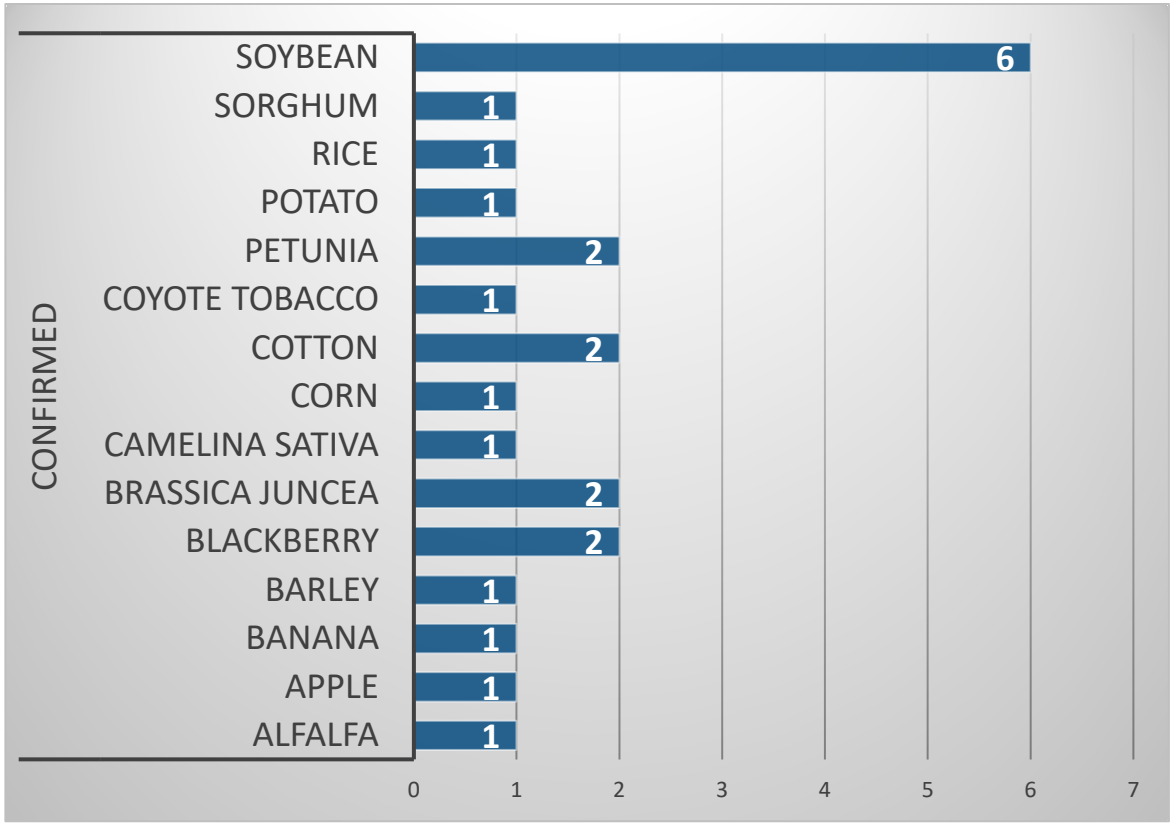


As of November 7, 2022

Institution Type



- Variety of Plants Confirmed Exempt



Average BRS Response Time

BRS emails technical response	BRS sends confirmation response to sufficiently detailed request	Total days with BRS to get confirmation response letter
34 days	43 days	87 days

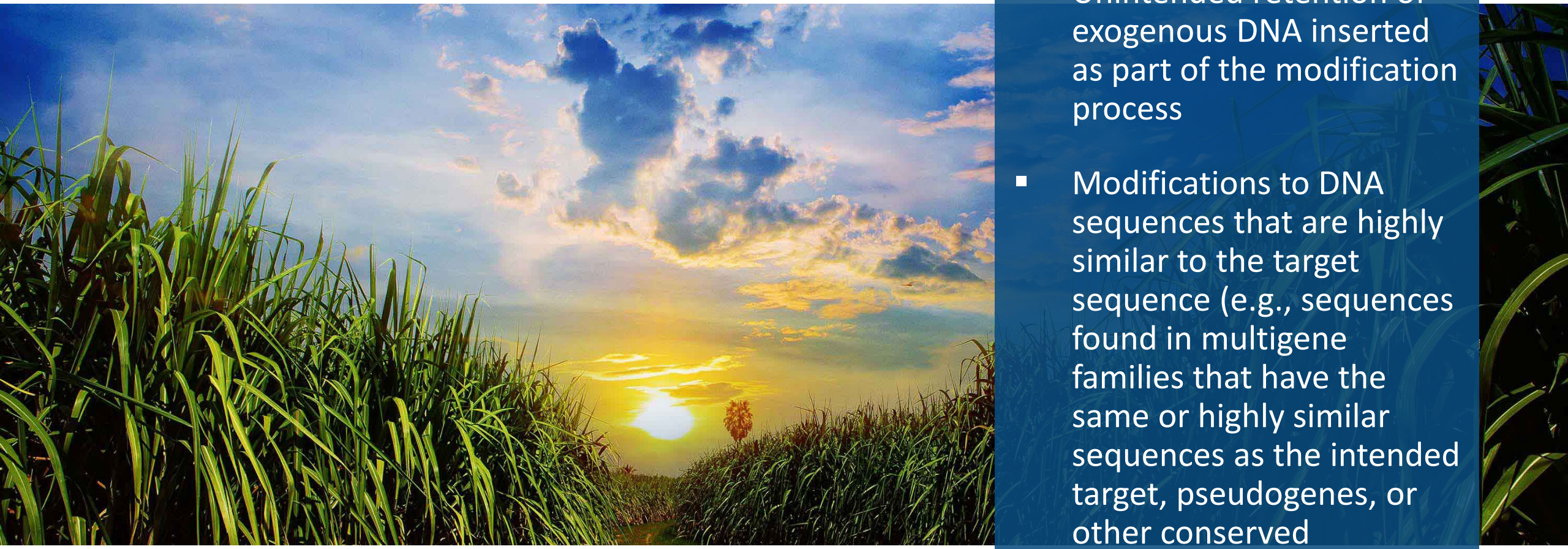
As of November 7, 2022

On September 1, 2022, USDA-APHIS published an updated Confirmation Request Guide

Reorganized the sections to better clarify what qualifies for exemption

- Equivalent to conventional breeding category
- Same Plant-Trait-Mechanism of Action category

Unintended Modifications



- Unintended retention of exogenous DNA inserted as part of the modification process
- Modifications to DNA sequences that are highly similar to the target sequence (e.g., sequences found in multigene families that have the same or highly similar sequences as the intended target, pseudogenes, or other conserved sequences)

THANK YOU!

CR Table:
https://www.aphis.usda.gov/aphis/ourfocus/biotechnology/regulatory-processes/confirmations/responses/cr-table

CR Guide:
https://www.aphis.usda.gov/brs/pdf/requesting-confirmation-of-exemption.pdf

Submit a Confirmation of Exemption Request to:
ConfirmationRequests@usda.gov

Agenda

- **Regulatory Status Review Process**
- Q&A Session
- Break
- Permits Update
- Microbes Update
- Compliance Inspections Update
- International Engagement
- Q&A Session
- Final Remarks and Adjournment

Regulatory Status Review Process Update

Suma Chakravarthy
Branch Chief, Plant Evaluation Branch
Biotechnology Risk Analysis Programs

Subray Hegde
Director
Biotechnology Risk Analysis Programs
APHIS Biotechnology Regulatory Services

Regulatory Status Review (RSR)

RSR evaluates plant pest risk based on:

1. the biological properties of the plant
2. the trait (or new characteristic)
3. the mechanism of action (or how the developer caused the new trait to occur)

Regulatory Status Review Process (RSR)

1

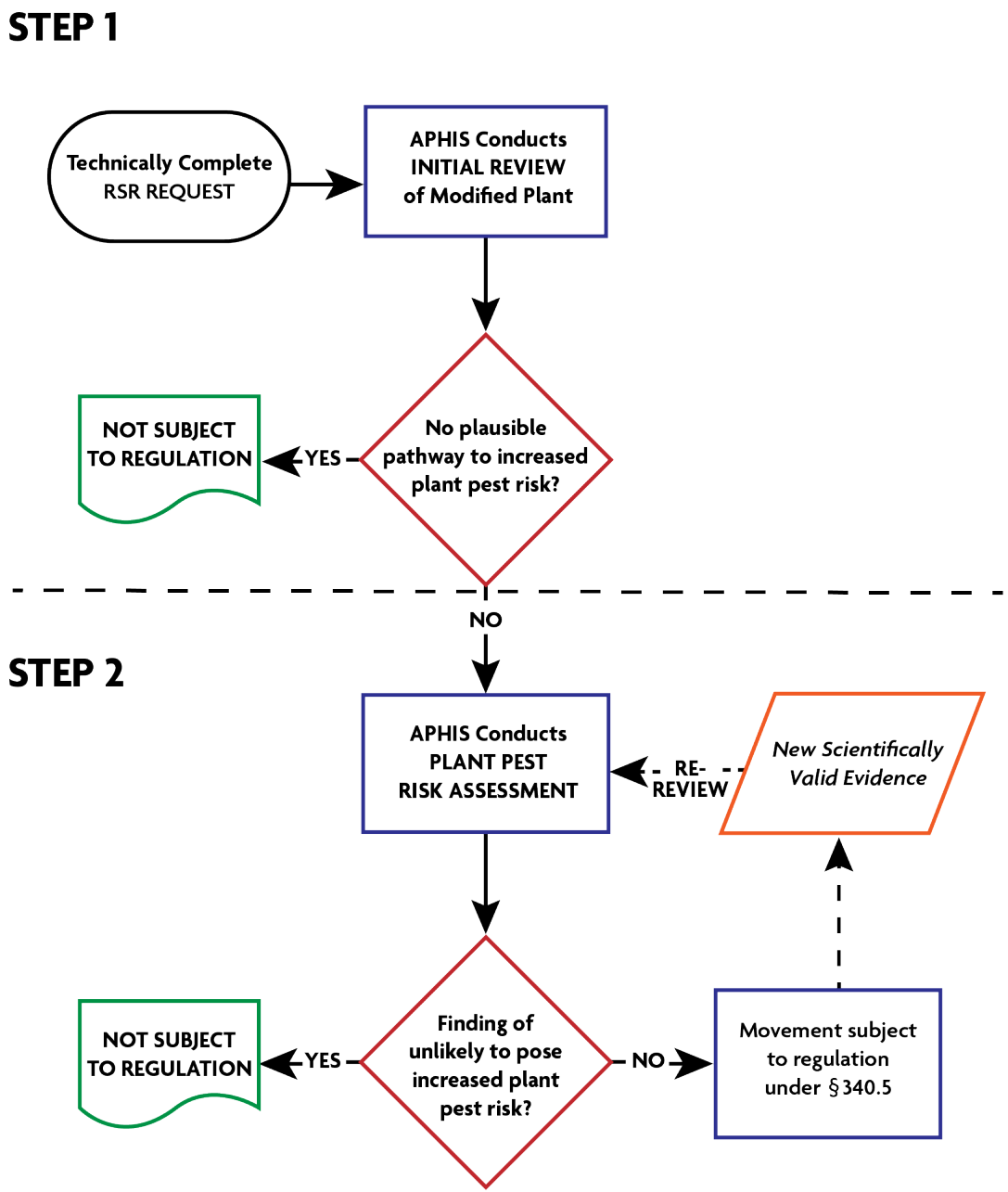
Initial review problem formulation to identify whether there are plausible pathways to increased plant pest risk

2

Plant Pest Risk Assessment (PPRA) determines likelihood and consequence of any plausible pathways in the initial review

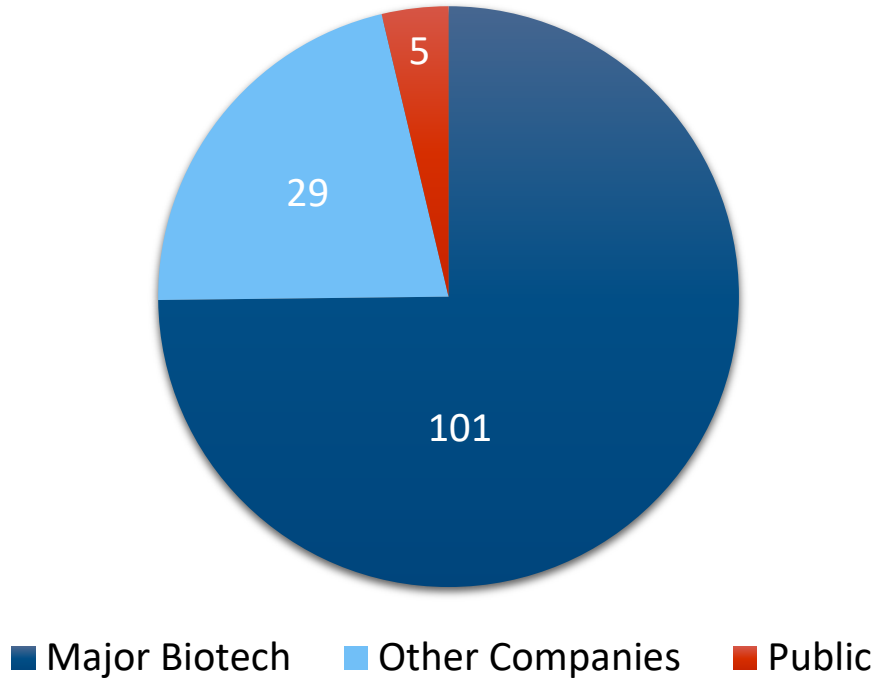
USDA Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

The RSR Process



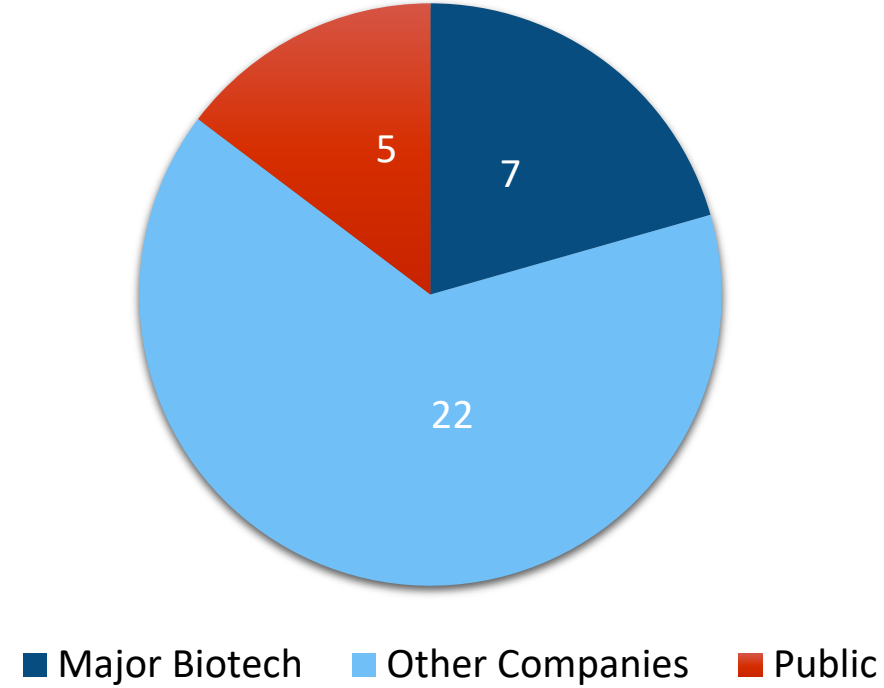
Impact of Revised Regulations

Completed Petitions



19 Crops
1992-2020

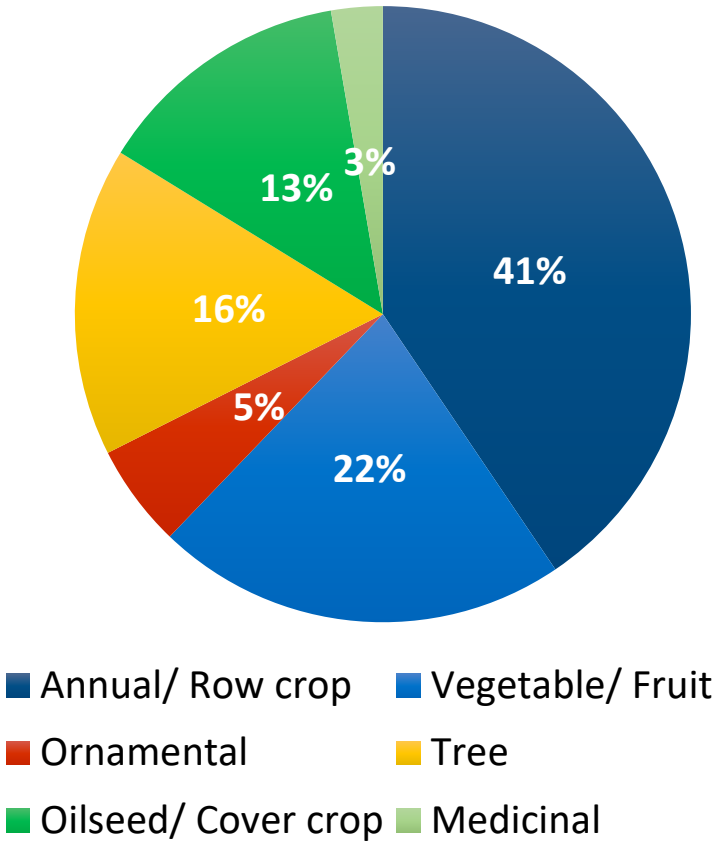
Regulatory Status Reviews (RSR)



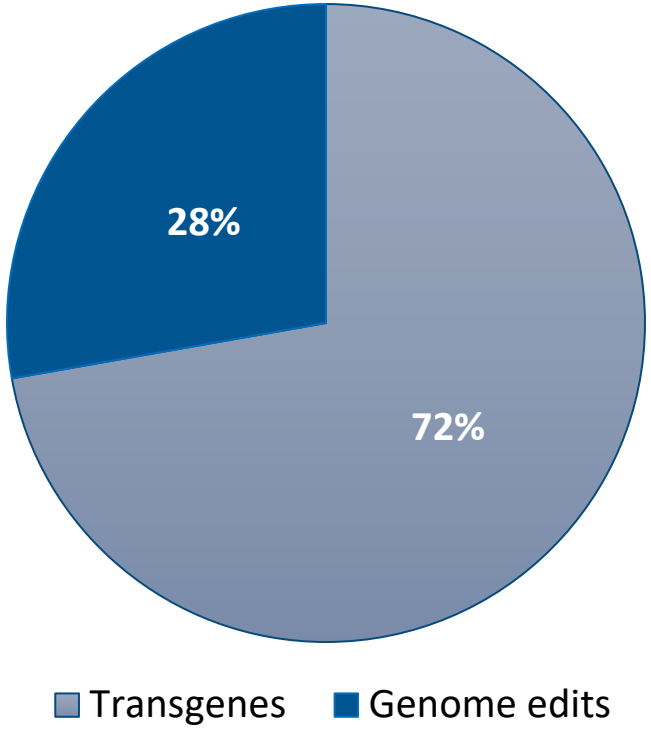
20 Crops
2020-Present

RSR Requests

Crop/Plant categories



Nature of modification



Completed RSRs

Norfolk Tomato
Enhanced Nutrition

Agrivida Corn
Improved Digestion for Feed

Toolgen Potato
Reduced Browning

Simplot Potato
Improved Product Quality and Disease Resistance

Infinite Enzymes Corn

Enzyme for potential detoxification

Technically complete to response in about 390 days

RSR Submission Requirements

Information about the modified plant

- Plant species
- Trait
- Phenotype
- Mechanism of Action

RSR Submission Requirements

Information specific to the modification

Genotype of the modified plant

- Sequence of the insert/edit
  - For edits: alignment to comparator sequence
- Publicly available reference numbers
- Annotation and function description
  - Component type, name, genetic donor, function, and base pair location

Thank you!

Agenda

- **Q&A Session**
- Break
- Permits Update
- Microbes Update
- Compliance Inspections Update
- International Engagement
- Q&A Session
- Final Remarks and Adjournment

Q&A

Break

Agenda

- **Permits Update**
- Microbes Update
- Compliance Inspections Update
- International Engagement
- Q&A Session
- Final Remarks and Adjournment

USDA APHIS BRS Permitting Update

Deshui Zhang
Branch Chief, Plants Branch
Biotechnology Risk Analysis Programs
Biotechnology Regulatory Services

December 8, 2022

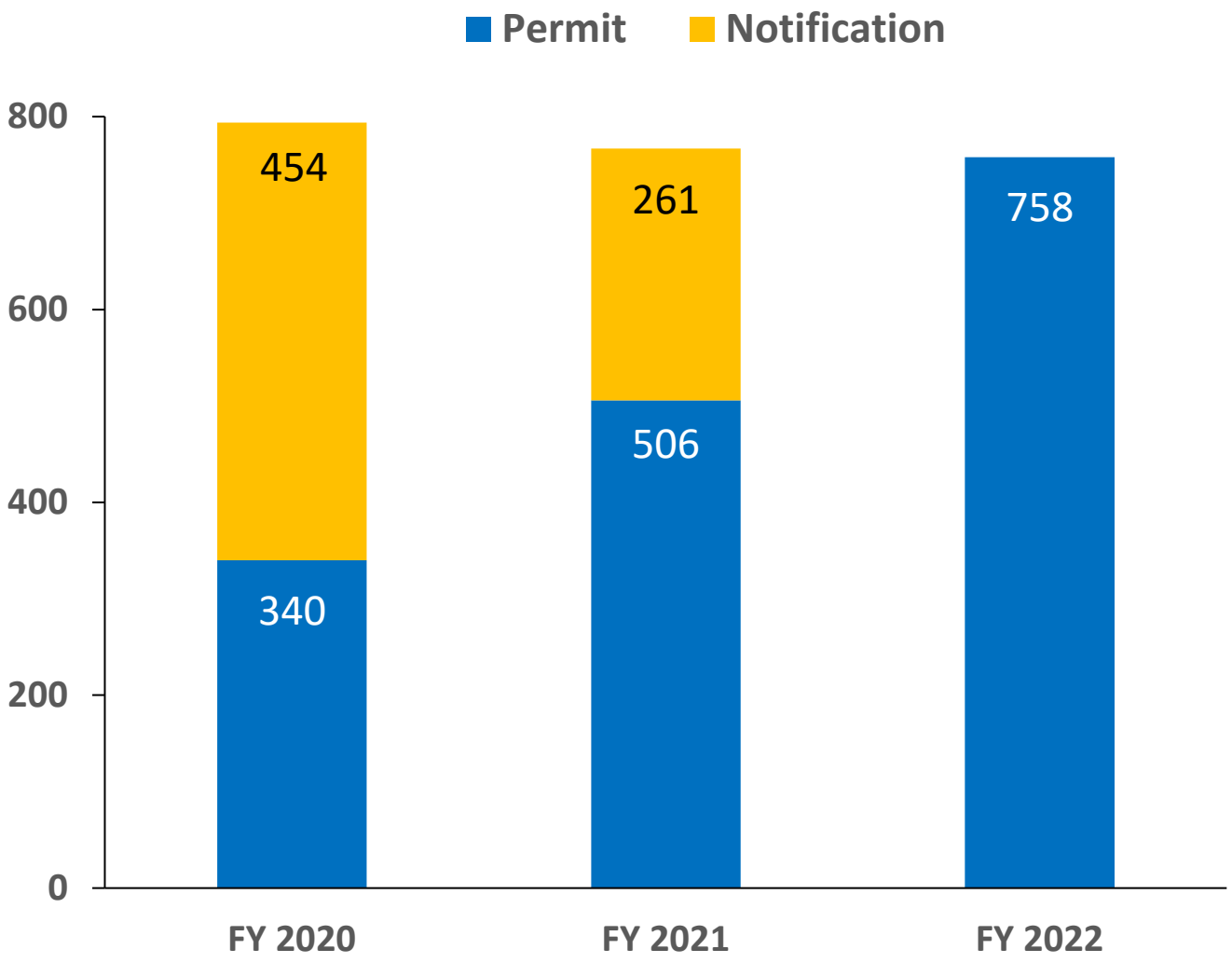
Overview

- Update on permits
- APHIS eFile outlook in FY 2023

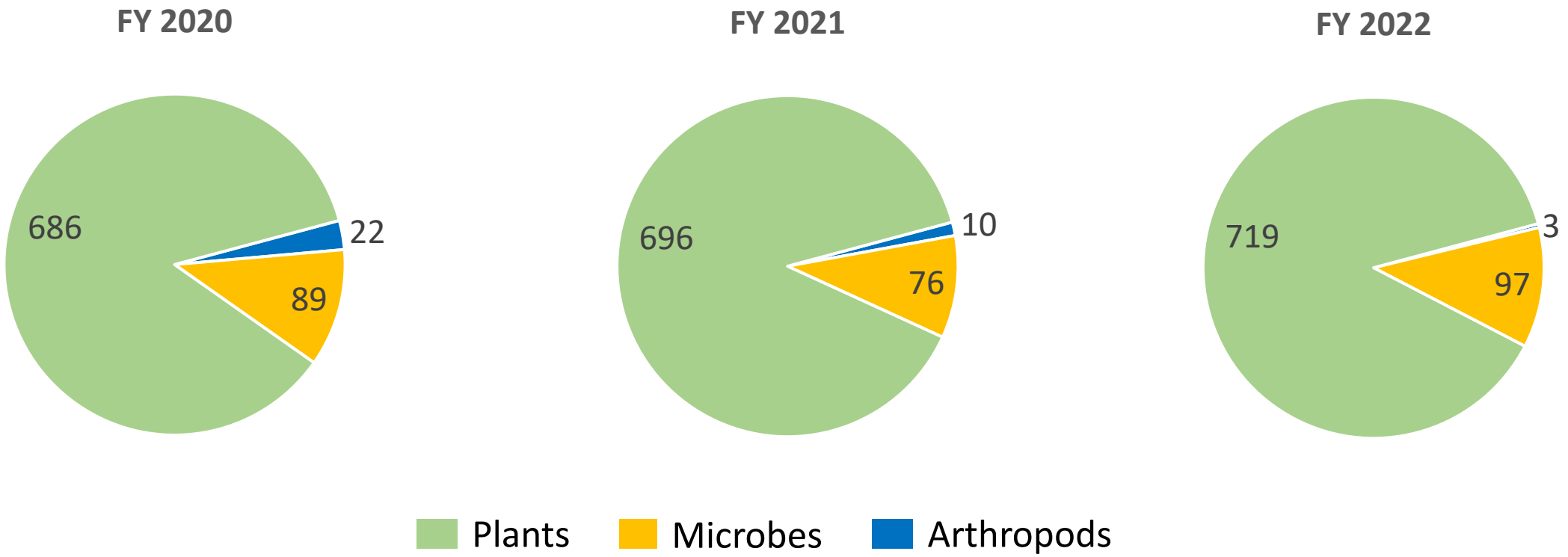
Update on Authorizations – Context

- FY 2020: APHIS eFile, ePermits, and Legacy biotechnology regulations
- FY 2021: Transition year, ePermits and Legacy biotechnology regulation phased out on April 4, 2021
- FY 2022: First full year with APHIS eFile and Revised biotechnology regulations

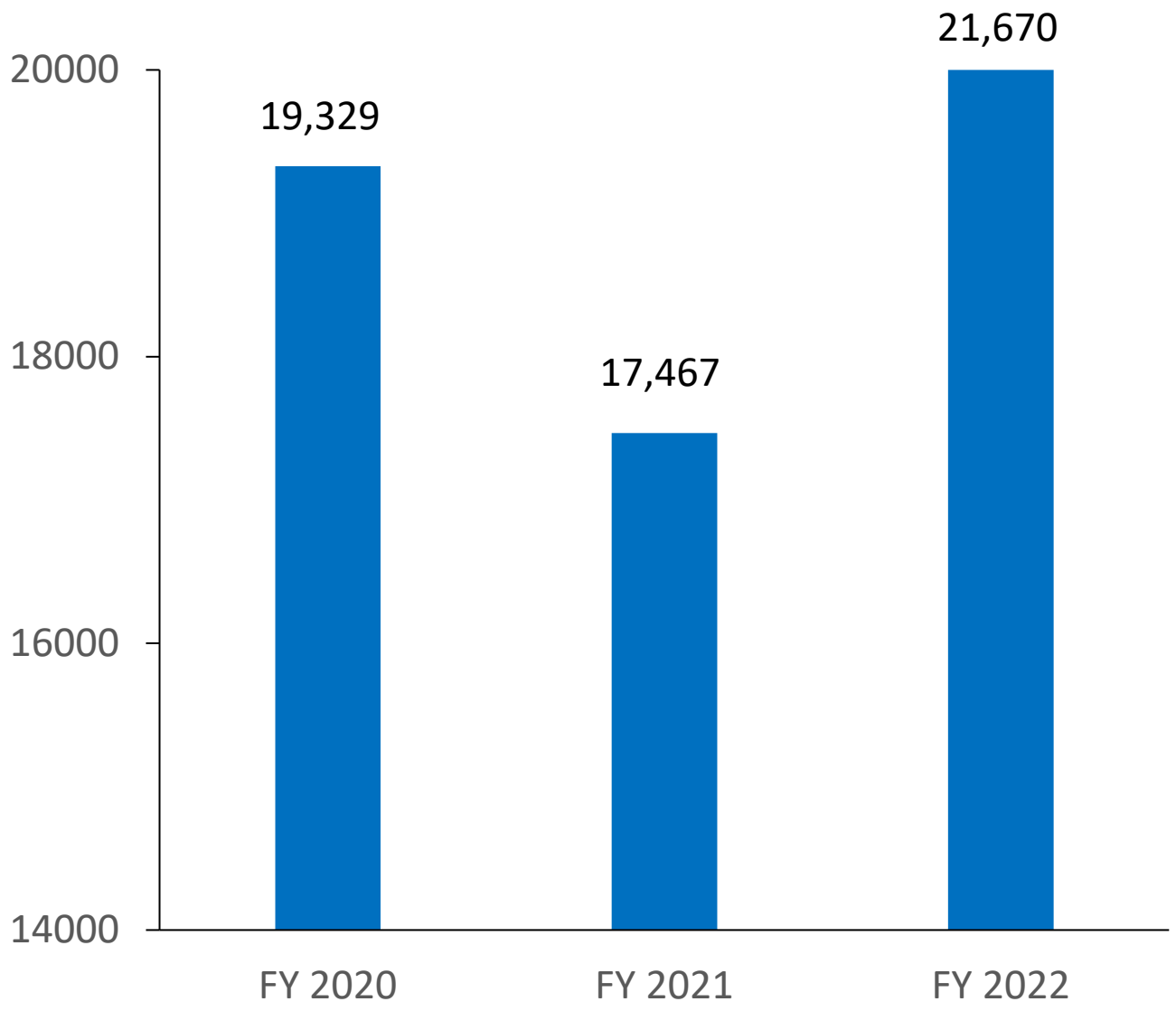
Authorized Permits and Notifications



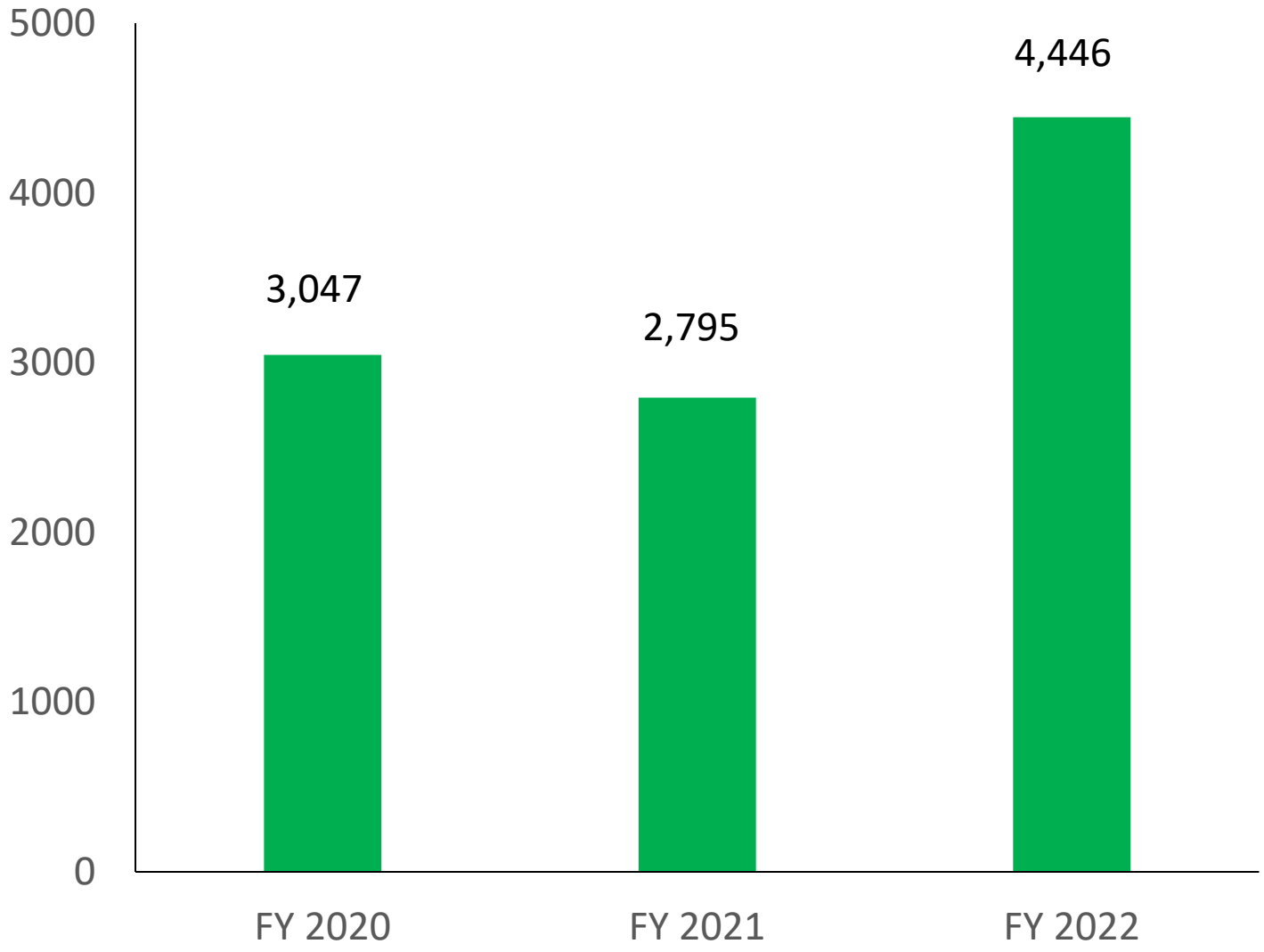
Authorizations – Organism Types



Authorized Constructs



Authorized Release Locations



Permitting Update – Average Application Duration

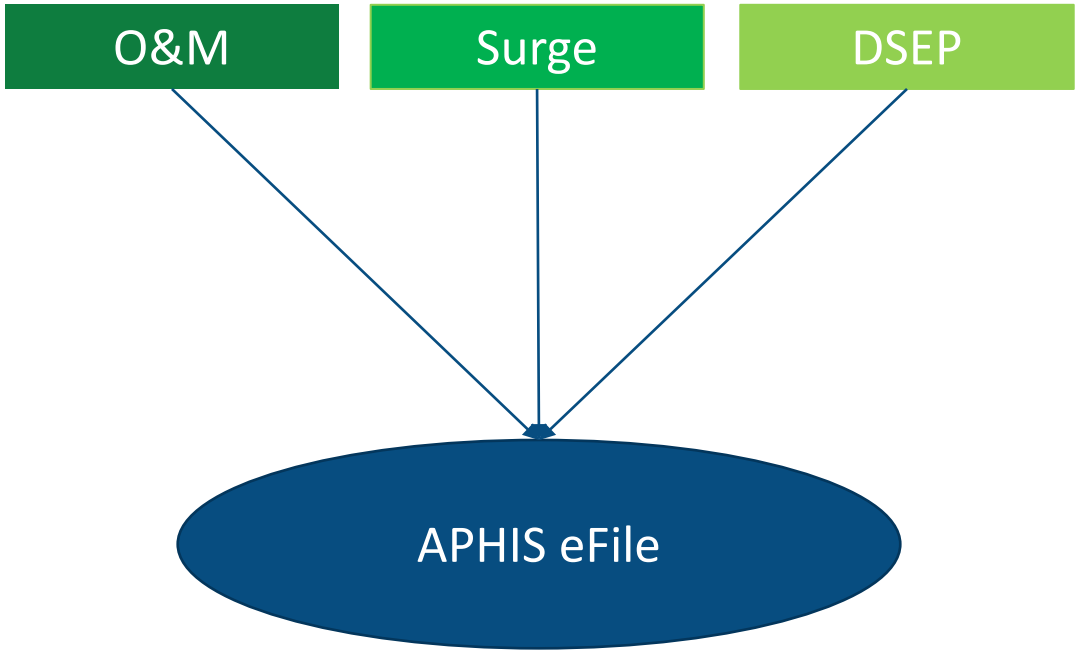
Movement Type	Import	Interstate Movement	Release	Interstate Movement and Release
FY 2020 (Legacy)	46	42	67	61
FY 2021 (Legacy)	42	37	66	79
FY 2021 (Revised)	45	43	39	72
FY 2022 (Revised)	43	41	65	84

- **Import or Interstate movement target timeframe: ≤ 60 days (legacy), 45 days (revised).**
- **Release and IMR target timeframe: ≤ 120 days (legacy or revised).**

APHIS eFile Outlook - FY 2023

Investing $1 M to maintain and enhance APHIS eFile for BRS permitting

- Bug fixes
- Functional enhancements



Permitting Outlook - FY 2023: APHIS eFile

CATEGORY	Help Text	Backlog & Reporting	Planting Reports
OBJECTIVE	• Increase support of application creation • Clarify BRS expectations	• Address bugs and make system enhancements • Improve reporting capacity in APHIS eFile	• Improve submission success of planting reports
RESULT	• Draft and submit applications with less assistance from BRS staff • Reduce back and forth discussion during internal BRS application processing • Improve internal BRS processing times		• Independently submit and view planting reports without BRS intervention

THANK YOU!

Agenda

- **Microbes Update**
- Compliance Inspections Update
- International Engagement
- Q&A Session
- Final Remarks and Adjournment

Permit Requirements for Microbes Developed Using Genetic Engineering

Martha Malapi
Branch Chief, Plant Pest & Protectants
Biotechnology Risk Analysis Programs
Biotechnology Regulatory Services

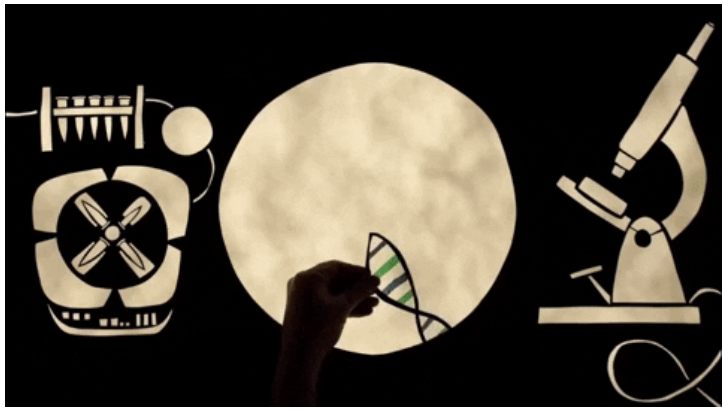
December 8, 2022

Modified Microbes

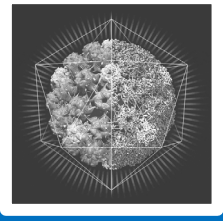
Meets the definition of a plant pest; or

Has received DNA from a plant pest, and the DNA is capable of producing an infectious agent, or encodes a compound, that causes plant disease; **or**

Used to control plant pests and could pose a plant pest risk

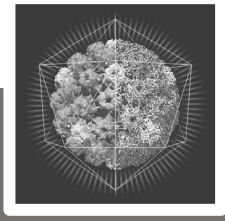


Exemptions from Permitting Requirements



Modified Disarmed *Agrobacterium* Species

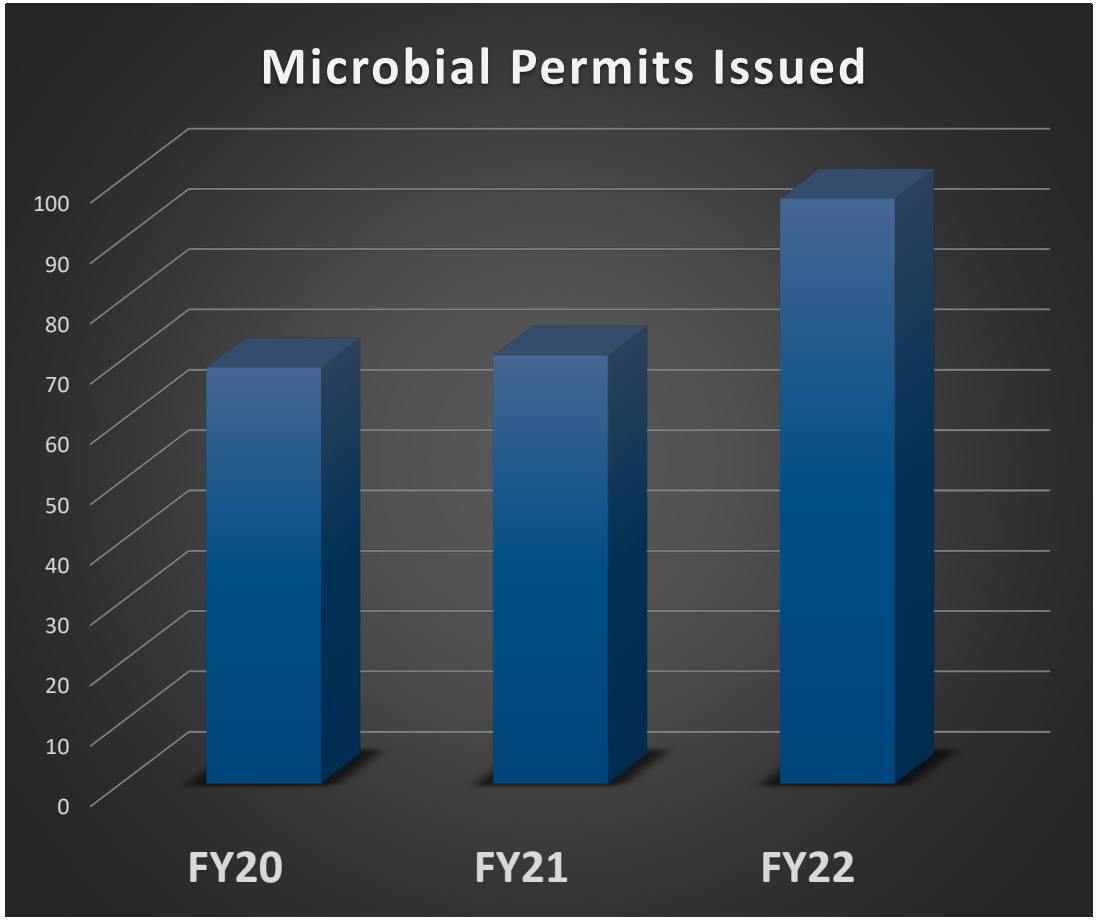
- A permit for importation or interstate movement is not required for any disarmed *Agrobacterium* spp.
- Option to request a Letter of No Permit Required from BRS for importation.

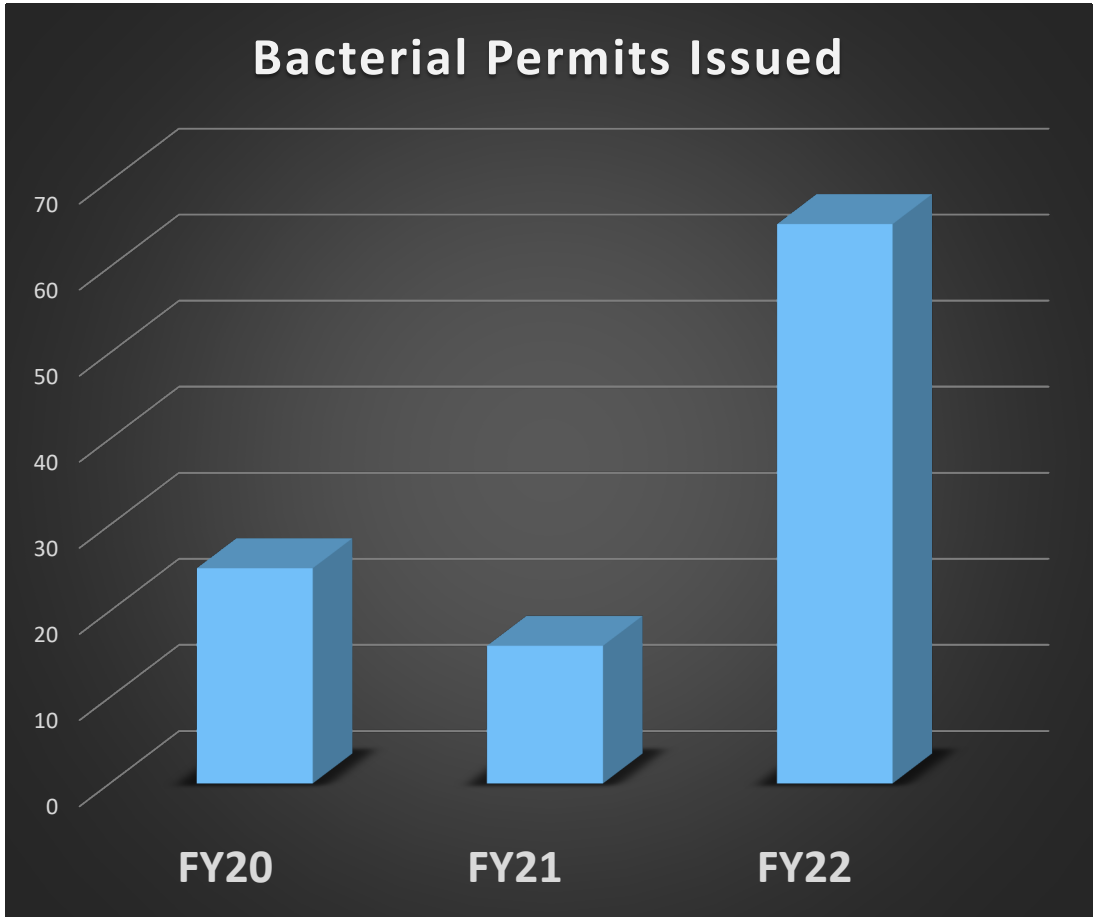


Certain Microbial Pesticides

- A permit is not required for the movement or environmental release of any modified microorganism product that is (1) currently registered with the EPA as a microbial pesticide and that is (2) not a plant pest.

Trends in Permit Applications





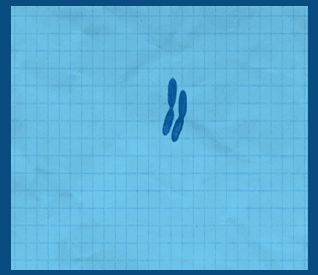
Clarity on Regulatory Requirements

House Appropriations Committee (2023 draft): Take measurable steps to establish a predictable and science-based regulatory pathway (scope of 340, outreach/engagement, scoping for regulatory status review process for microbes).

Executive Order 14081: Identify areas of ambiguity, gaps, or uncertainties in the Coordinated Framework; Improve the clarity of the regulatory processes and establish a plan for updating or streamlining regulations and guidance documents; and enhance the Unified Website for Biotechnology Regulation.

- The Future of Microbial Biotechnology Workshop, Organized by the Innovative Genomics Institute and USDA. February 2022.
- U.S. Regulatory Policy Workshop--Genome-Edited Microbial Products for Agricultural Use, Organized by CERSA and NC State University. September 2022.

Commonly Asked Questions and Answers



Questions & Answers

Working with Microorganisms Developed Using Genetic Engineering Under 7 CFR part 340

August 2022

Overview

APHIS regulates the importation, interstate movement, and environmental release of microorganisms developed using genetic engineering (modified microorganisms) that could pose a plant pest risk under 7 CFR part 340. Regulated microorganisms include plant pests, biological control organisms, and other microbes that could pose a plant pest risk.

Unless otherwise specified, importation and interstate movement are collectively referred to as "move" or "movement" in this document. Environmental release is also called a "confined field trial."

Q: What microorganisms are regulated under 7 CFR part 340?

A: APHIS regulates modified microorganisms that are plant pests or that could pose a plant pest risk. The regulations (7 CFR § 340.2) require a permit for the movement or environmental release of any modified microorganism that:

- Meets the definition of a plant pest (7 CFR § 340.3); or
- Is not a plant but has received deoxyribonucleic acid (DNA) from a plant pest and the DNA from the donor organism either is capable of producing an infectious agent that causes plant disease or encodes a compound that is capable of causing plant disease; or
- Is a microorganism used to control plant pests and could pose a plant pest risk.

If you are uncertain whether your modified microorganism is subject to the regulations at 7 CFR part 340, please send an email to biotechquery@usda.gov.

Q: When submitting a question to biotechquery@usda.gov, is there certain information I should include in my message?

A: Yes. It is helpful to provide the following information:

- The organism's genus and species.
- Construct components and donors: Genus and species of the organism(s) from which the genetic material was obtained.
- Construct components: Detailed description of functions.
- The phenotype or intended trait expected from the modification.

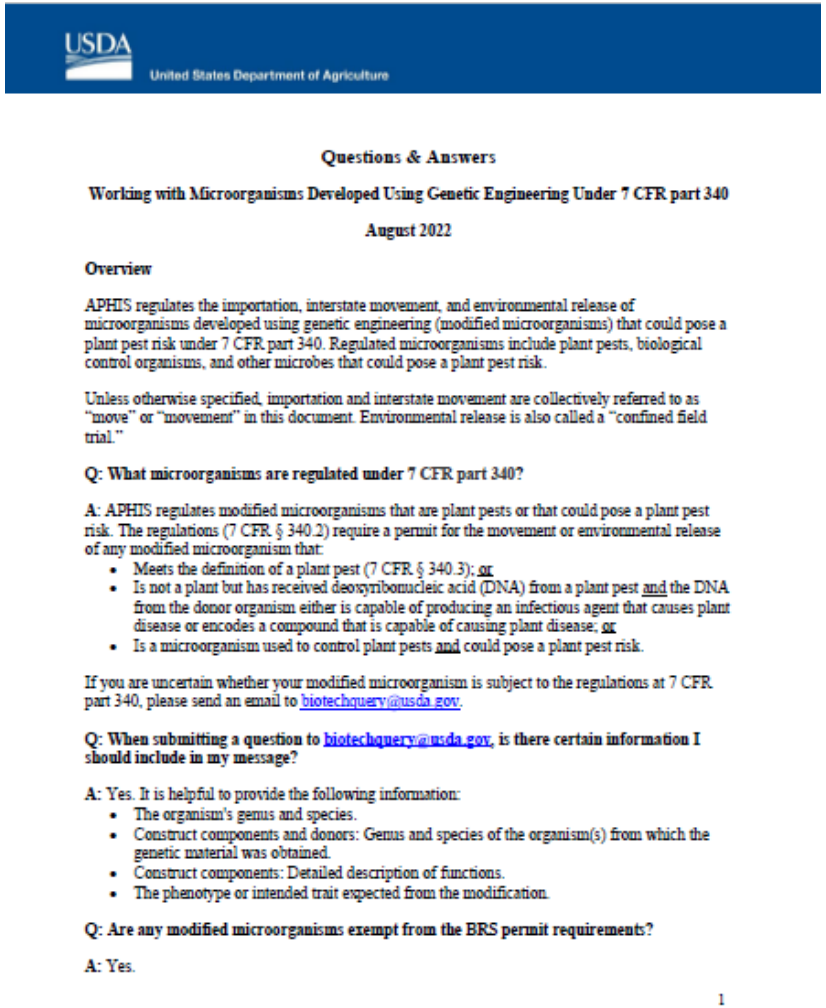
Q: Are any modified microorganisms exempt from the BRS permit requirements?

A: Yes.

https://www.aphis.usda.gov/biotechnology/downloads/faq-modified-microbes.pdf

Commonly Asked Questions and Answers

- Reviewed a total of ~ 700 biotech queries
- 152 queries (21%) were specific for modified microorganisms
- Most queries were for modified bacteria, followed by viruses and then fungi



USDA United States Department of Agriculture

Questions & Answers

Working with Microorganisms Developed Using Genetic Engineering Under 7 CFR part 340

August 2022

Overview

APHIS regulates the importation, interstate movement, and environmental release of microorganisms developed using genetic engineering (modified microorganisms) that could pose a plant pest risk under 7 CFR part 340. Regulated microorganisms include plant pests, biological control organisms, and other microbes that could pose a plant pest risk.

Unless otherwise specified, importation and interstate movement are collectively referred to as "move" or "movement" in this document. Environmental release is also called a "confined field trial."

Q: What microorganisms are regulated under 7 CFR part 340?

A: APHIS regulates modified microorganisms that are plant pests or that could pose a plant pest risk. The regulations (7 CFR § 340.2) require a permit for the movement or environmental release of any modified microorganism that:

- Meets the definition of a plant pest (7 CFR § 340.3); or
- Is not a plant but has received deoxyribonucleic acid (DNA) from a plant pest and the DNA from the donor organism either is capable of producing an infectious agent that causes plant disease or encodes a compound that is capable of causing plant disease; or
- Is a microorganism used to control plant pests and could pose a plant pest risk.

If you are uncertain whether your modified microorganism is subject to the regulations at 7 CFR part 340, please send an email to biotechquery@usda.gov.

Q: When submitting a question to biotechquery@usda.gov, is there certain information I should include in my message?

A: Yes. It is helpful to provide the following information:

- The organism's genus and species.
- Construct components and donors: Genus and species of the organism(s) from which the genetic material was obtained.
- Construct components: Detailed description of functions.
- The phenotype or intended trait expected from the modification.

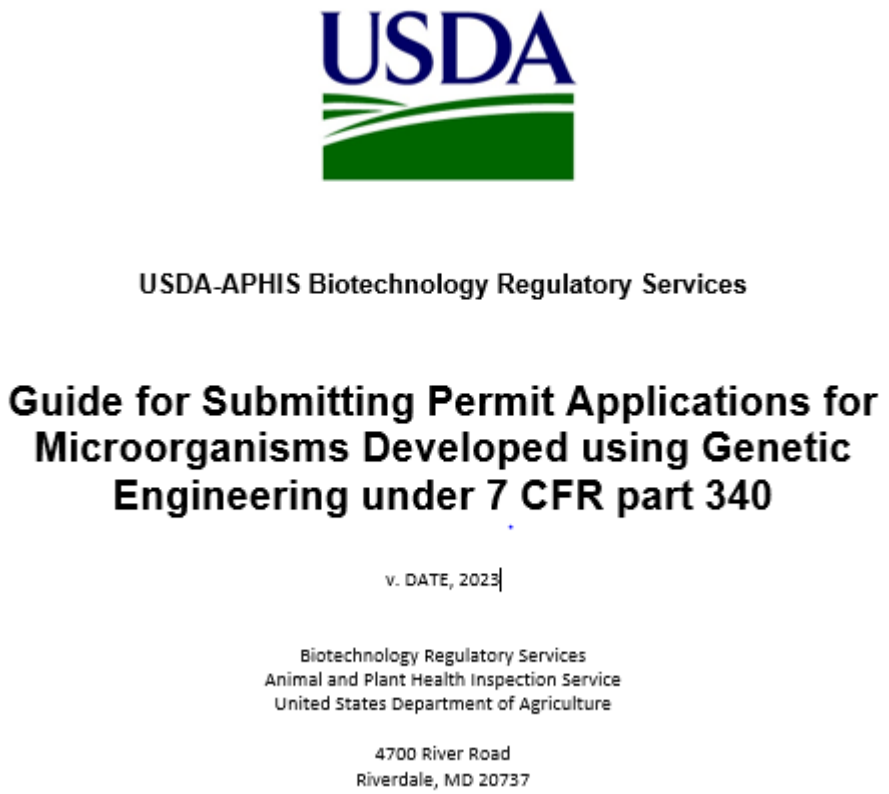
Q: Are any modified microorganisms exempt from the BRS permit requirements?

A: Yes.

1

https://www.aphis.usda.gov/biotechnology/downloads/faq-modified-microbes.pdf

Guide Under Development


USDA

USDA-APHIS Biotechnology Regulatory Services

Guide for Submitting Permit Applications for Microorganisms Developed using Genetic Engineering under 7 CFR part 340

v. DATE, 2023

Biotechnology Regulatory Services
Animal and Plant Health Inspection Service
United States Department of Agriculture

4700 River Road
Riverdale, MD 20737

Synopsis

- Microorganisms Regulated Under 7 CFR part 340
- Permit Applications for Modified Microorganisms
- Information to include
  - About the modification to the microbe
  - For movement permits: SOPs for shipping; SOPs for containment
  - For environmental releases: SOP to ensure that field trial is confined in time and space
  - In-season activities
  - Trial termination
  - Post-season/post-trial
  - In-season and post-trial monitoring

Guide Under Development

USDA-APHIS Biotechnology Regulatory Services

Guide for Submitting Permit Applications for Microorganisms Developed using Genetic Engineering under 7 CFR part 340

v. DATE, 2023

Biotechnology Regulatory Services
Animal and Plant Health Inspection Service
United States Department of Agriculture

4700 River Road
Riverdale, MD 20737

- Current under agency review
- Target posting for public review and comment: March 2023
- Target posting of the final version on APHIS website: September 2023

THANK YOU!

Agenda

- **Compliance Inspections Update**
- International Engagement
- Q&A Session
- Final Remarks and Adjournment

Compliance and Inspection Updates

Doug Grant
Director, Regulatory Operations Programs

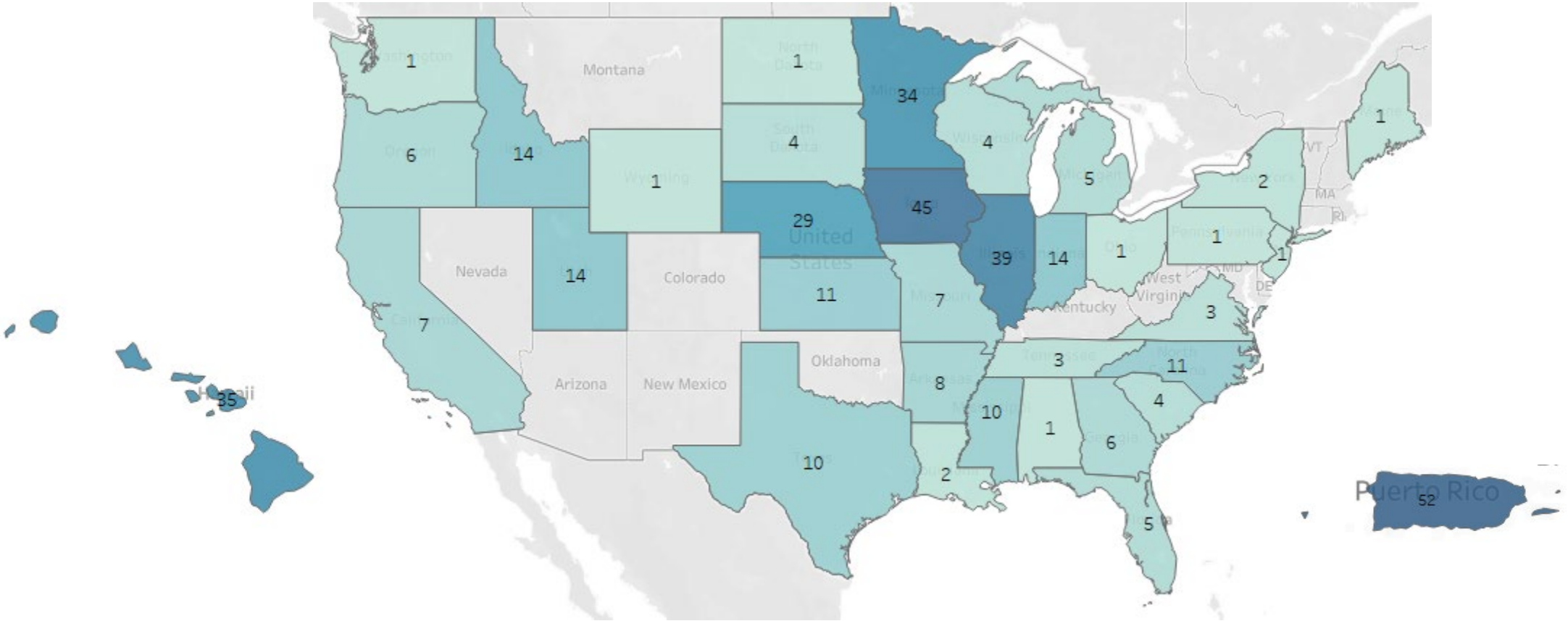
Nathaniel Yates
Branch Chief, Compliance Evaluation and Enforcement Branch

APHIS Biotechnology Regulatory Services
December 8, 2022

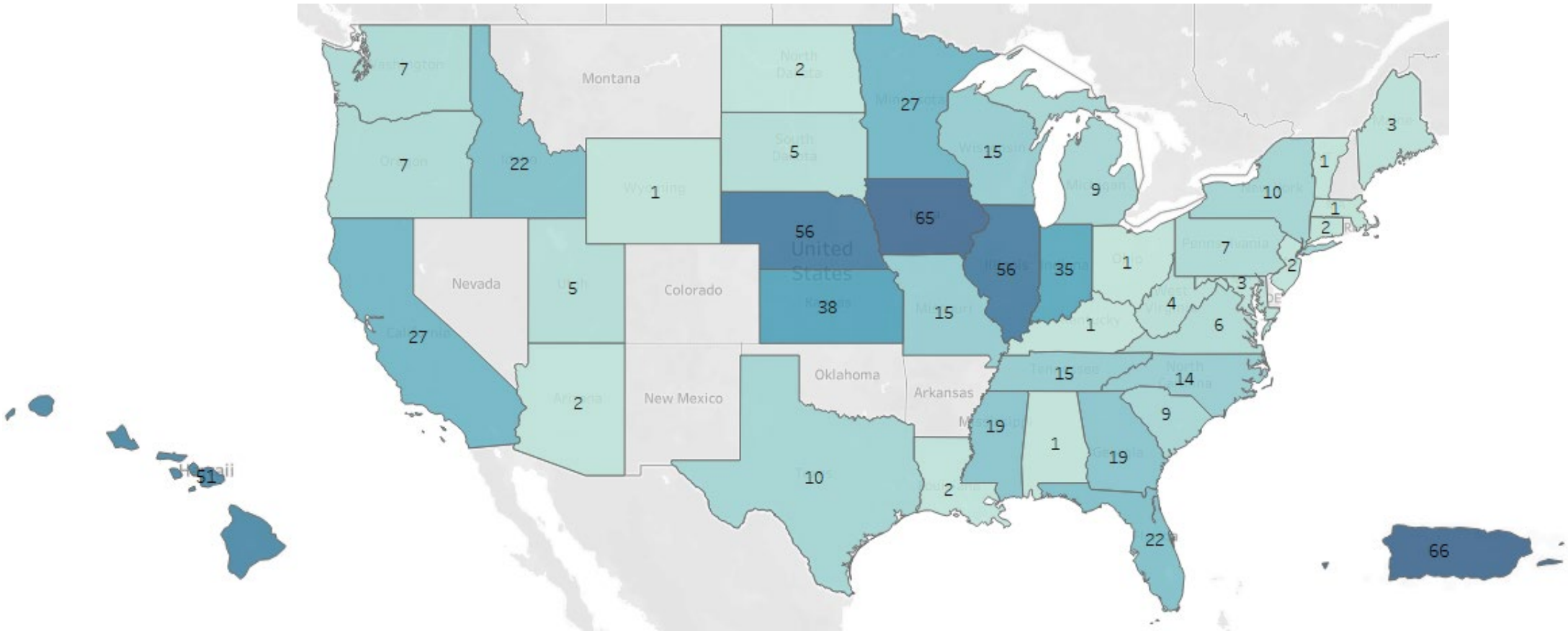
Regulatory Operations Programs (ROP) Statistics, Outcomes, and Projects

- Planting and inspection data
- In-person and virtual inspections statistics
- Compliance outcomes
- Most common non-compliance issues
- Projects in the coming year

FY 2022 Unique Plantings
Total = 833



FY 2022 Conducted Inspections
Total = 663



Percent of Inspections Conducted by Organization

FY	BRS	PPQ	State
19	69%	25%	6%
20	95%	4%	1%
21	86%	11%	3%
22	83%	13%	4%

FY 2022 BRS Inspections by Quarter

Quarter	New	Cumulative
1	41	41
2	114	155
3	120	275
4	388	663

Resumption of In-Person Inspections

- 63% in-person inspections in FY 2022 (420 of 663 inspections):
  - BRS: 313
  - PPQ: 79
  - States: 28
- Resumed after travel restrictions eased
- Certain trials (PMPIs, species with higher likelihood of persistence, trials with compliance issues) inspected at higher frequency
- Virtual and in-person inspections will continue in FY 2023

Compliance Inspection Outcomes

- Compliance Rates
  - FY 20 – 95%
  - FY 21 – 98%
  - FY 22 – 90%
- Notices sent in FY 22: 535
  - Trial Compliant: 481
  - Trial Non-compliant: 54
  - Other outcomes: 2

Common Compliance Challenges

- Planting in unauthorized locations
- Not following Supplemental Permit Conditions
- Late Planting Reports
- No Planting Report
- No Report of No Planting
- Late Volunteer Monitoring Report

USDA Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

FY 2023 ROP Projects

Sharing Draft Guide for Submitting Reports

THANK YOU!

Agenda

- **International Engagement**
- Q&A Session
- Final Remarks and Adjournment

International Collaboration

Jessica Mahalingappa
Associate Deputy Administrator
Animal and Plant Health Inspection Service
Biotechnology Regulatory Services

International Strategy Main Goals

1. Provide assurance of the credibility of BRS' regulations and regulatory processes internationally

2. Build capacity in other countries for regulating agricultural organisms developed using genetic engineering using risk-based approaches

FY2022 Successes

- Hosted or participated in over 15 international engagements
- Collaborated with international organizations and trade agencies
- Advanced harmonization

FY 2023 Plans

- Expand engagement with international regulators
- Continue to provide technical assistance to trade agencies to safeguard trade and minimize disruptions
  - Bioeconomy EO International outreach
- International harmonization efforts
  - Organization for Economic Cooperation and Development
  - Trilateral Technical Working Group
  - Asia-Pacific Economic Cooperation

Agenda

- **Q&A Session**
- Final Remarks and Adjournment

Q&A

THANK YOU!

Agenda

- **Final Remarks and Adjournment**