



Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

Investing in Research for U.S. Agricultural Productivity and Competitiveness

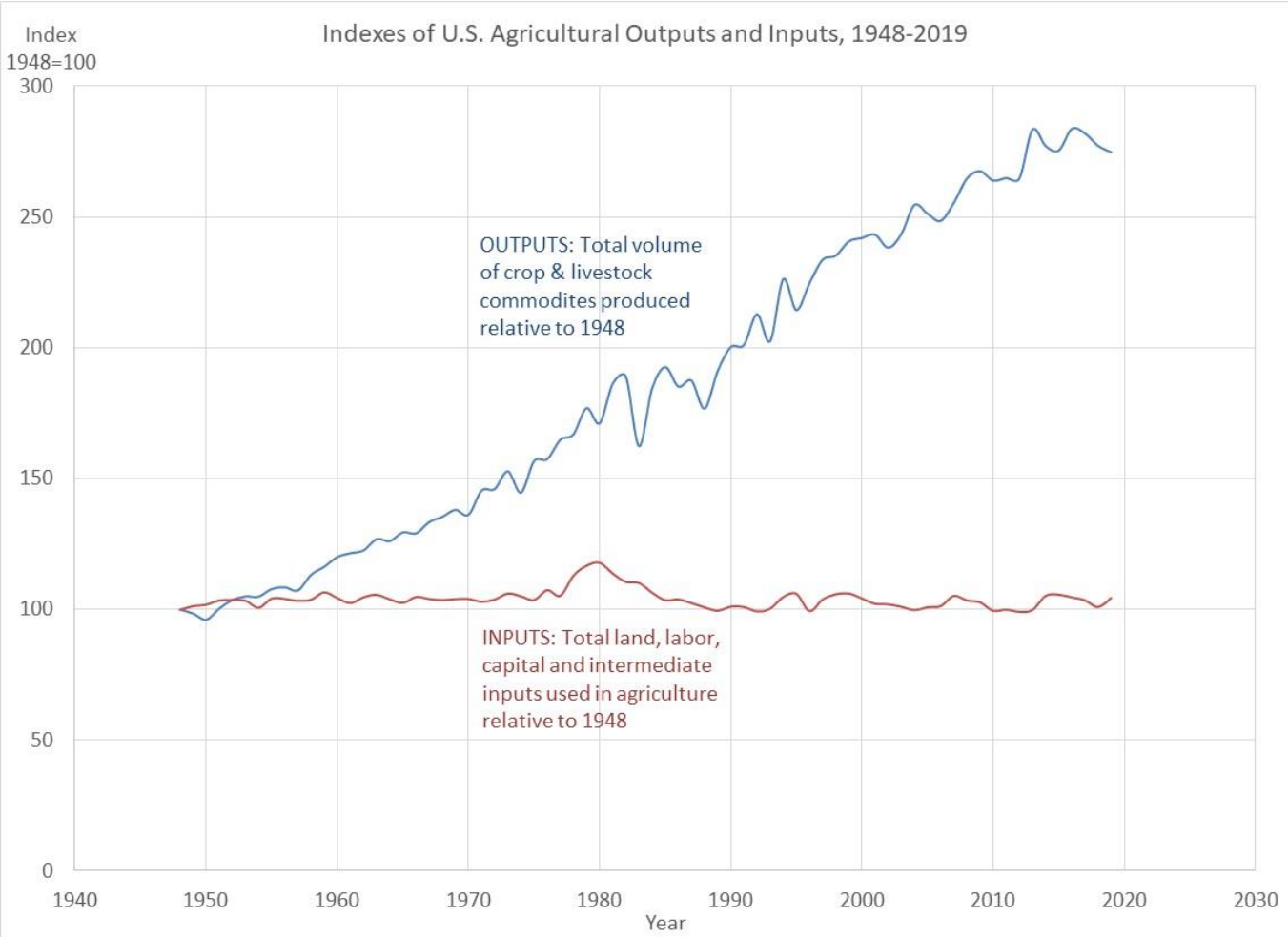
Keith Fuglie and Suzanne Thornsby

8th Annual Florida Agricultural Policy Outlook Conference
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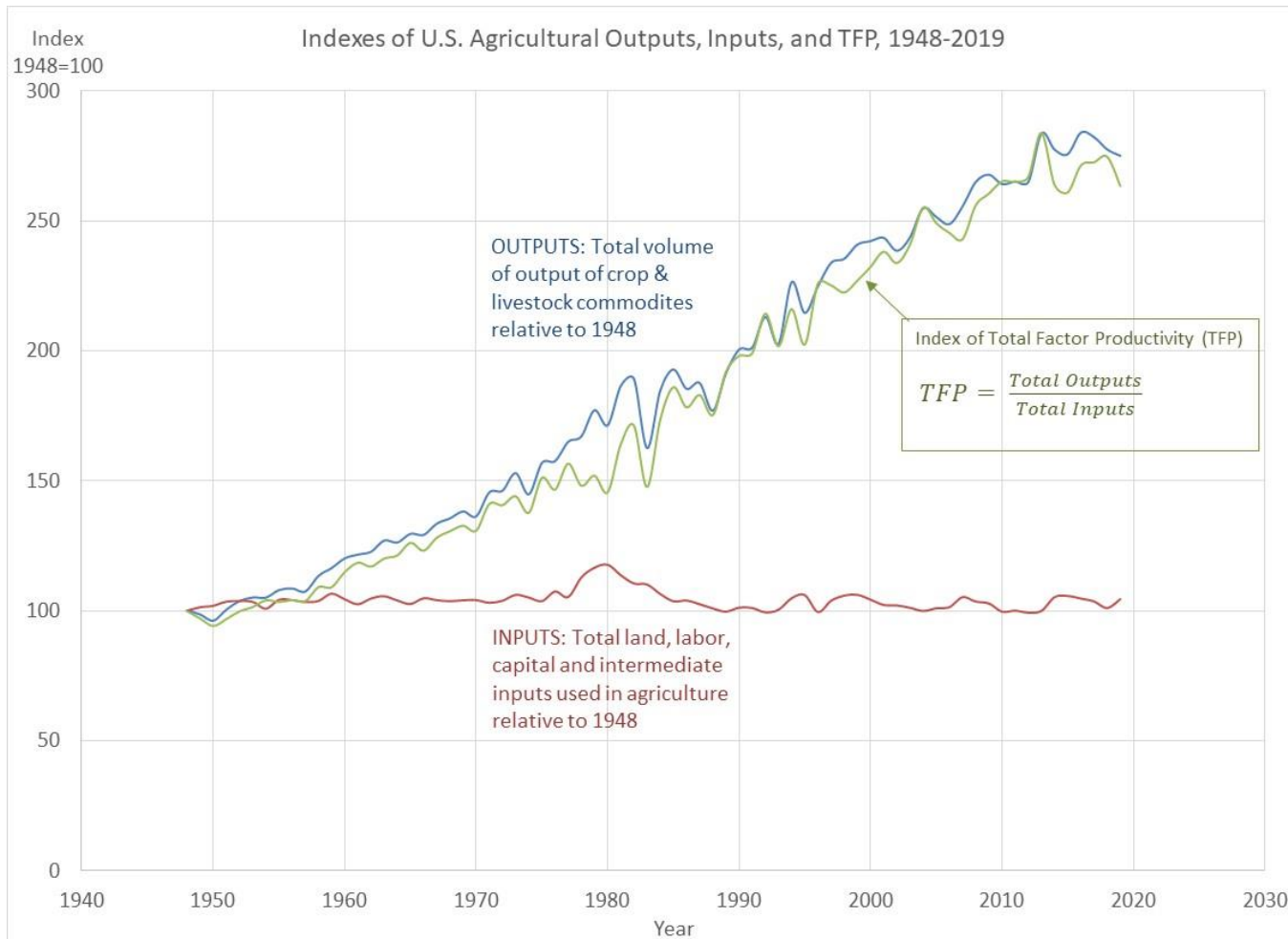
This work is supported by the U.S. Department of Agriculture, Economic Research Service. The findings and conclusions in this presentation are those of the authors and should not be construed to represent any official USDA or U.S. Government determination or policy.



Productivity is the primary driver of growth in US agriculture



“Total factor productivity” or TFP is the broadest available measure of economic efficiency

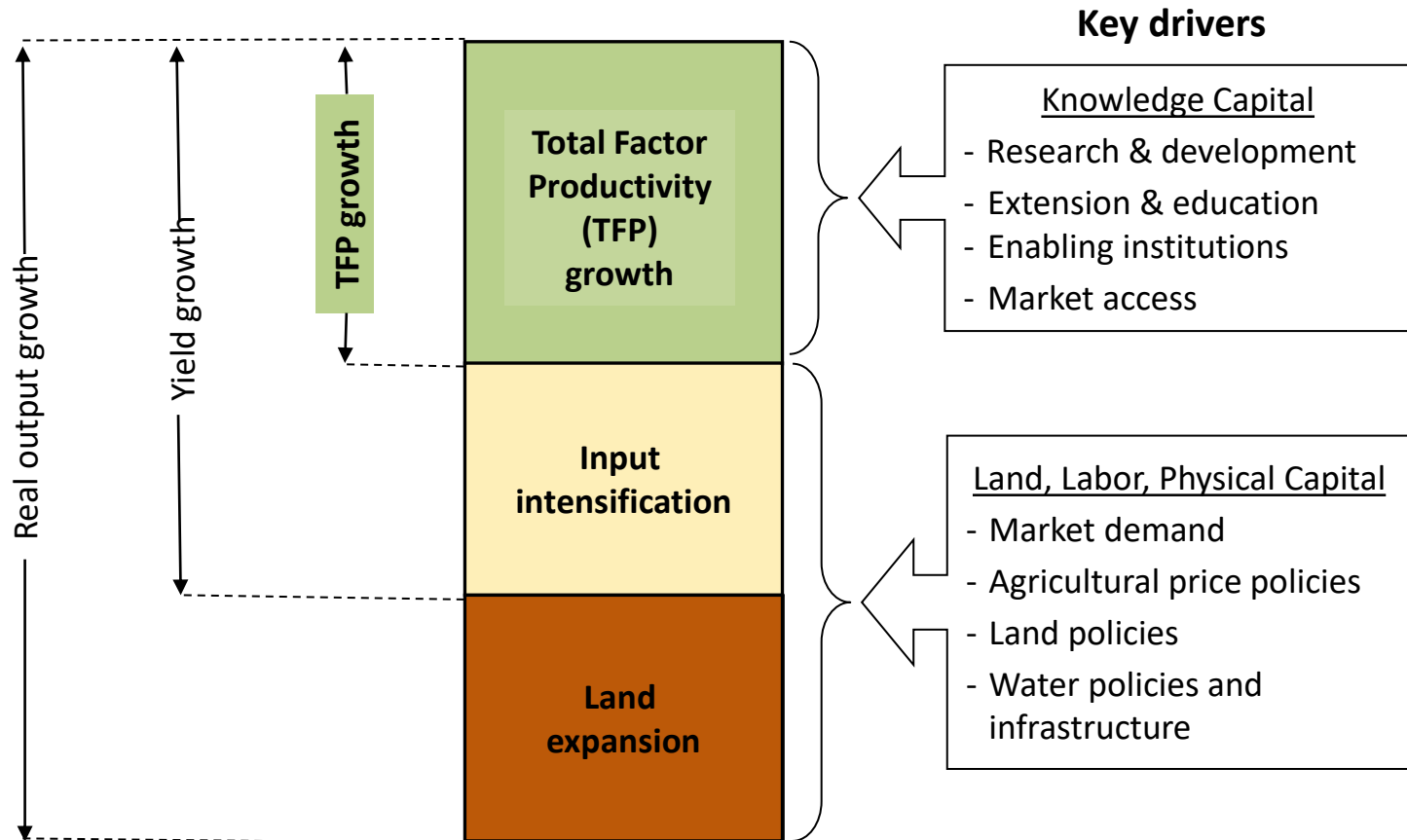


Raising TFP improves trade competitiveness and profitability

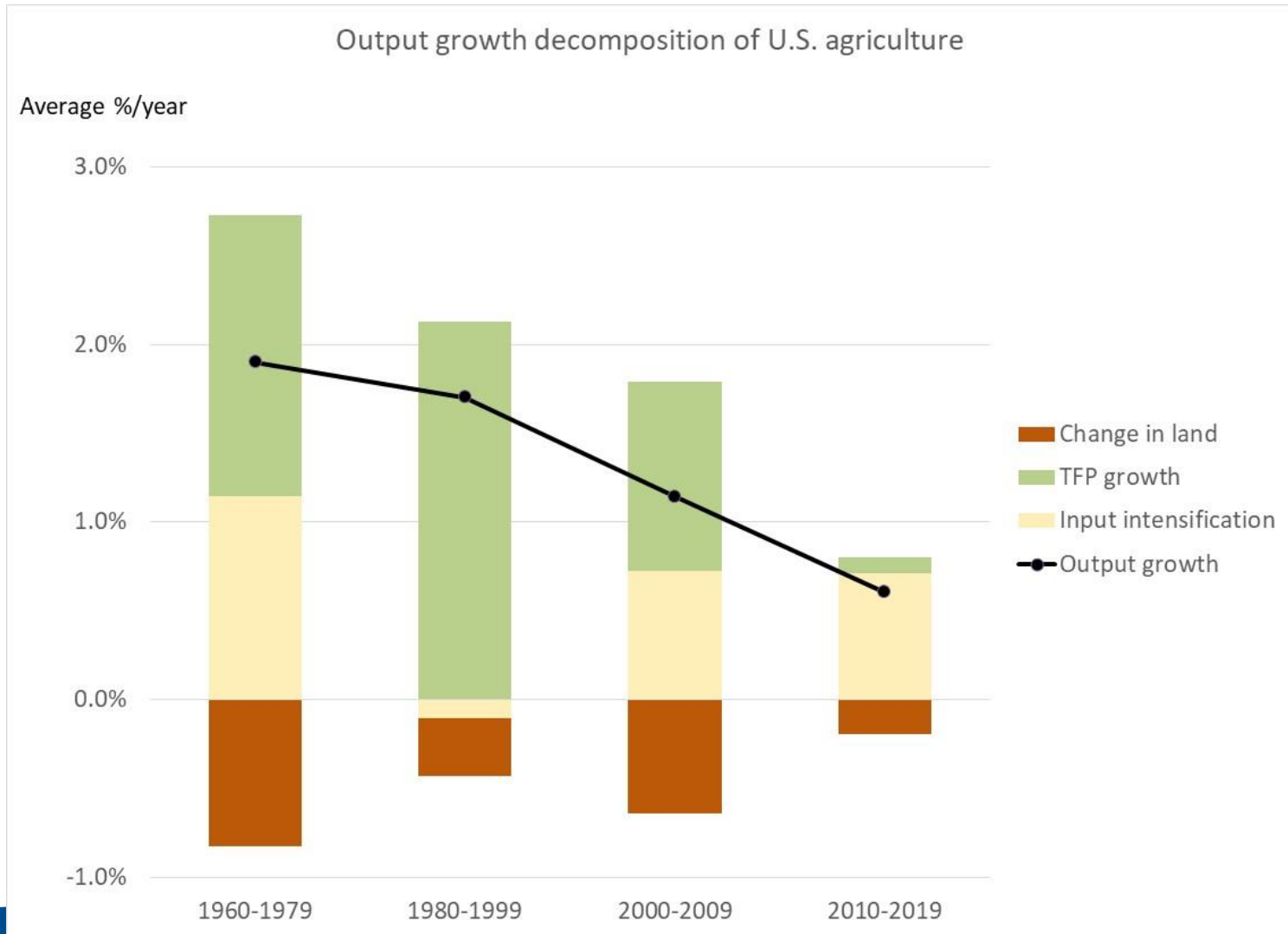
- 1% increase in TFP implies a 1% reduction in unit cost of production (holding prices fixed)
- Higher TFP helps keep agriculture profitable if/when prices fall



A closer look at sources of agricultural growth for long-run sustainability

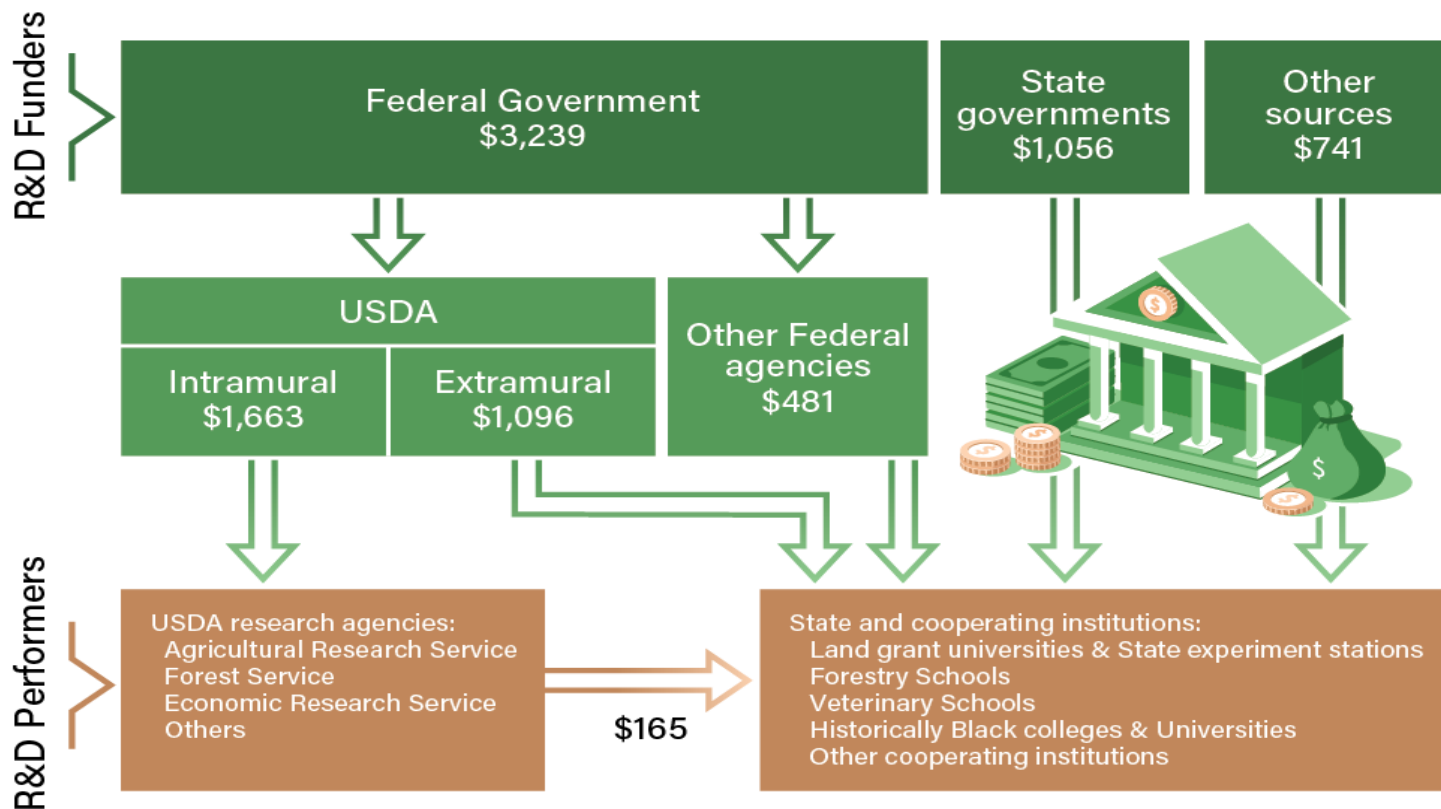


U.S. agricultural growth has slowed significantly, and its due to stagnant TFP



Funders and performers of U.S. public agricultural research in 2019

U.S. dollars, millions

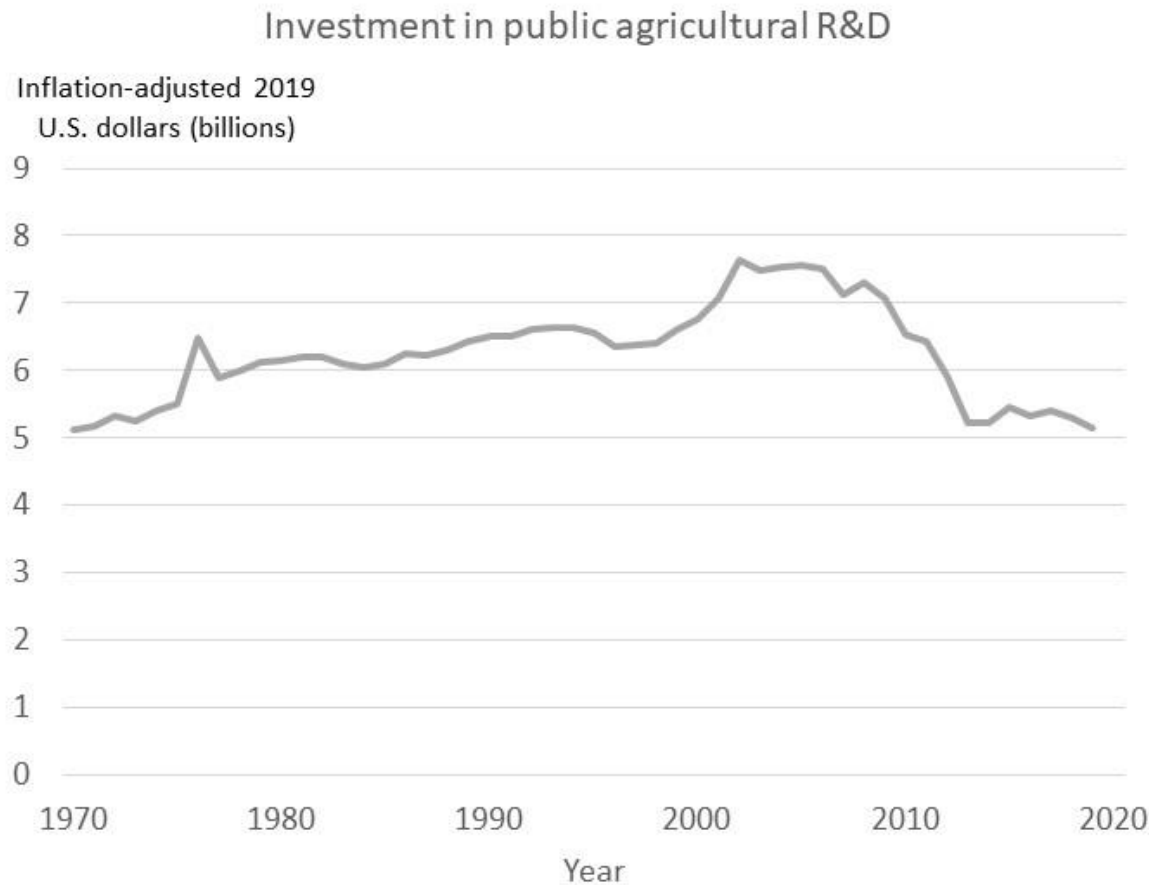


Notes: Total funds allocated to agricultural research and development (R&D) in 2019 were \$5.04 billion, while total reported expenditures by R&D performing institutions that year was \$5.16 billion because of differences in budget procedures and timing of expenditures.

Source: USDA, Economic Research Service based on data from USDA, National Institute of Food and Agriculture and National Science Foundation.



Public spending on agricultural R&D has fallen by about one-third since peaking in 2002

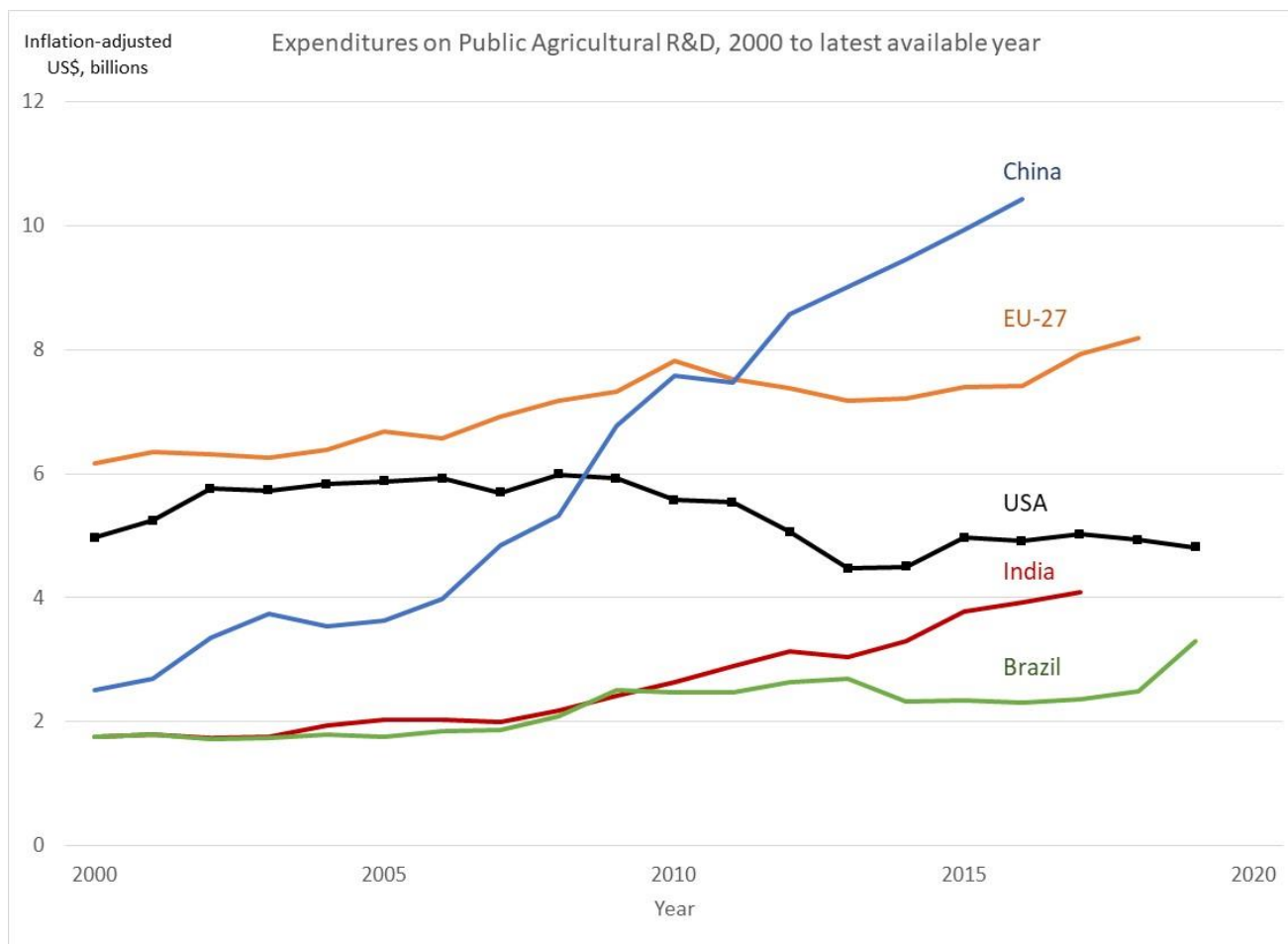


Challenges facing future growth in US agricultural productivity:

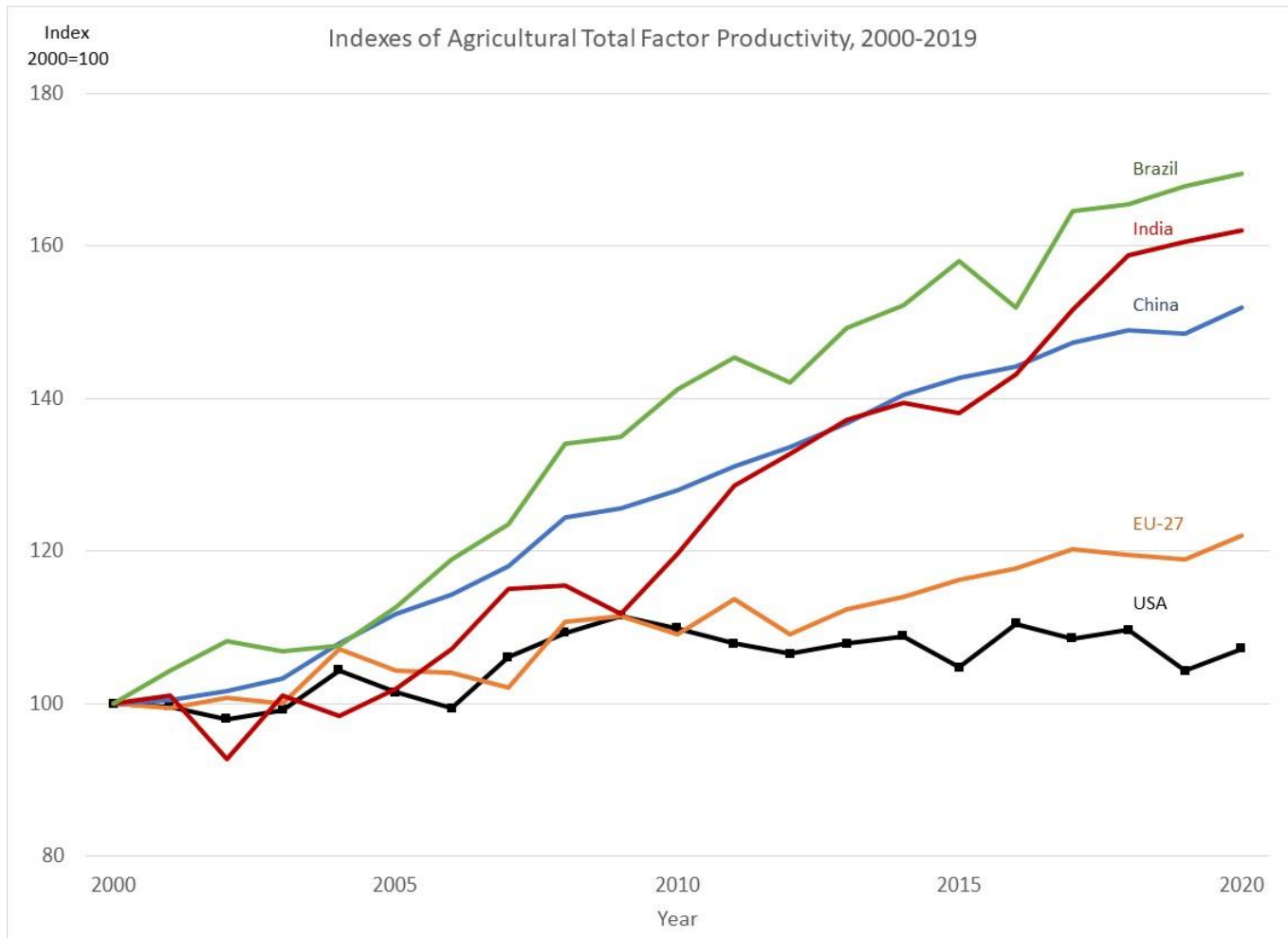
- Declining investment in agricultural R&D
 - Slower pace of innovation and productivity growth
- Consumer apprehensions with some new technologies and farming practices
 - Some prefer non-GMO foods; free-range poultry
- Climate change
 - May negatively affect crop yields
- Water scarcity (western states) and other environmental issues



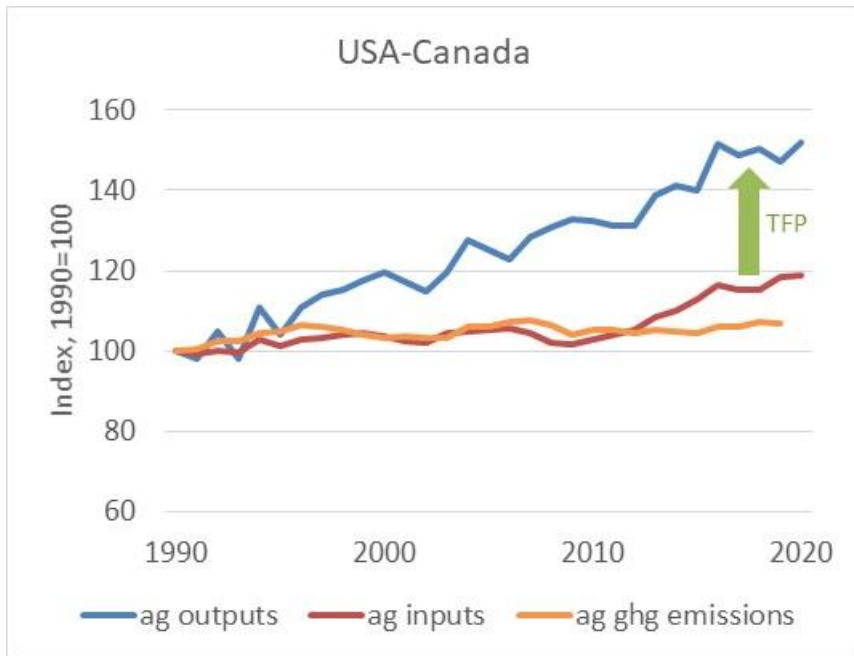
The United States has been losing ground to other countries in public investment in agricultural research and development (R&D)



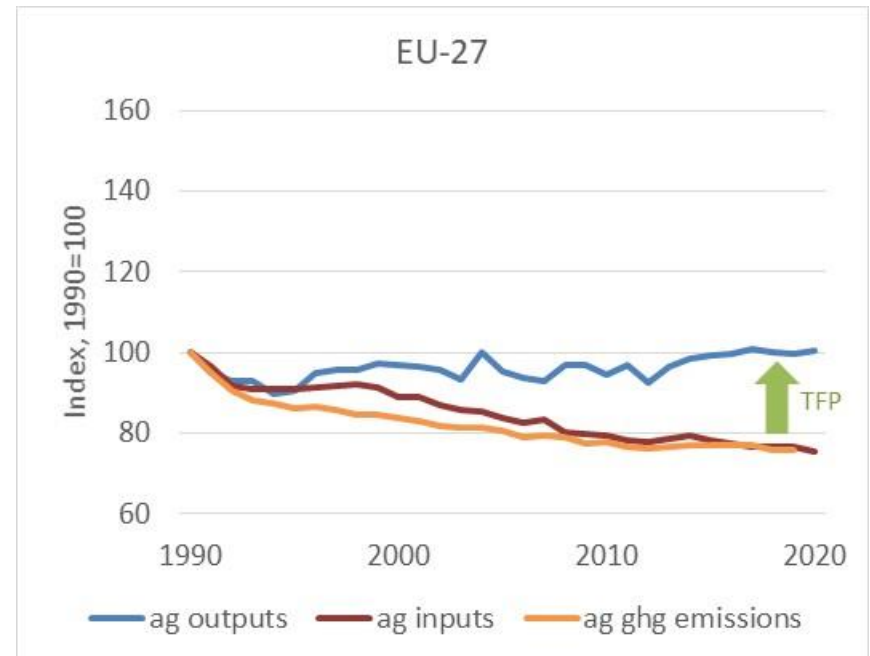
U.S. agricultural TFP has grown more slowly than in other major agricultural producers



Improving agricultural productivity can expand output and/or reduce inputs (including use of environmental resources)



Productivity growth has raised output, increasing exports and use for biofuels



Productivity growth has reduced inputs and lowered GHG emissions from agriculture

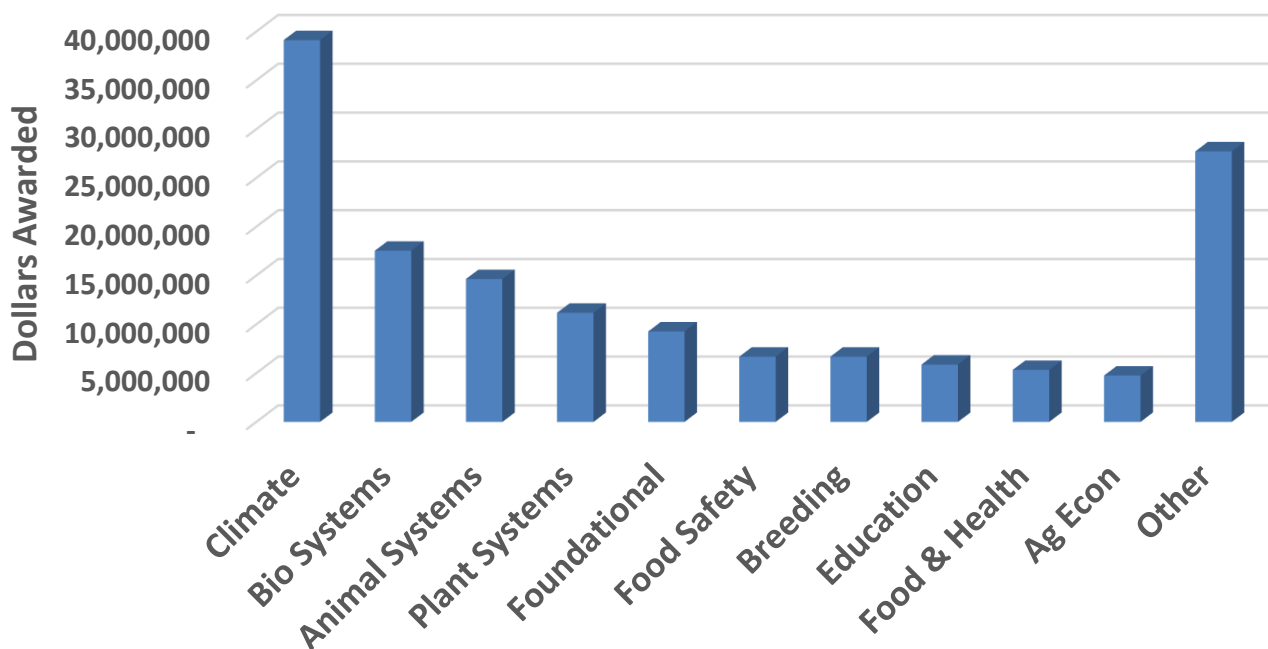


Why Does Farm Bill Supported Research Matter to Florida: Selected Examples



Agriculture Food & Research Initiative (AFRI) FY09-FY22

AFRI \$ awarded to Florida, FY09-FY22*
\$4.2 billion FY02-FY22 to all States (\$154 million to Florida)



Selected Florida Examples

- Advanced Renewables from Carinata
- Enhancing Southern Pine Climate Change Mitigation and Adaptation
- Understanding antibiotic resistance occurrence
- Agricultural Water Security
- Adapting kernel metabolism to enhance cereal yield
- Optimizing Future Crop Yield Projections
- Emerging Infectious Disease of a Rapidly Expanding Grass
- Blue Carbon Ecosystems along the South Florida Coast
- Hybrid Aerial/Underwater Robotic System
- Healthy Caregivers-Healthy Children

* Does not include sub-awards to Florida from other States

Source: USDA NIFA

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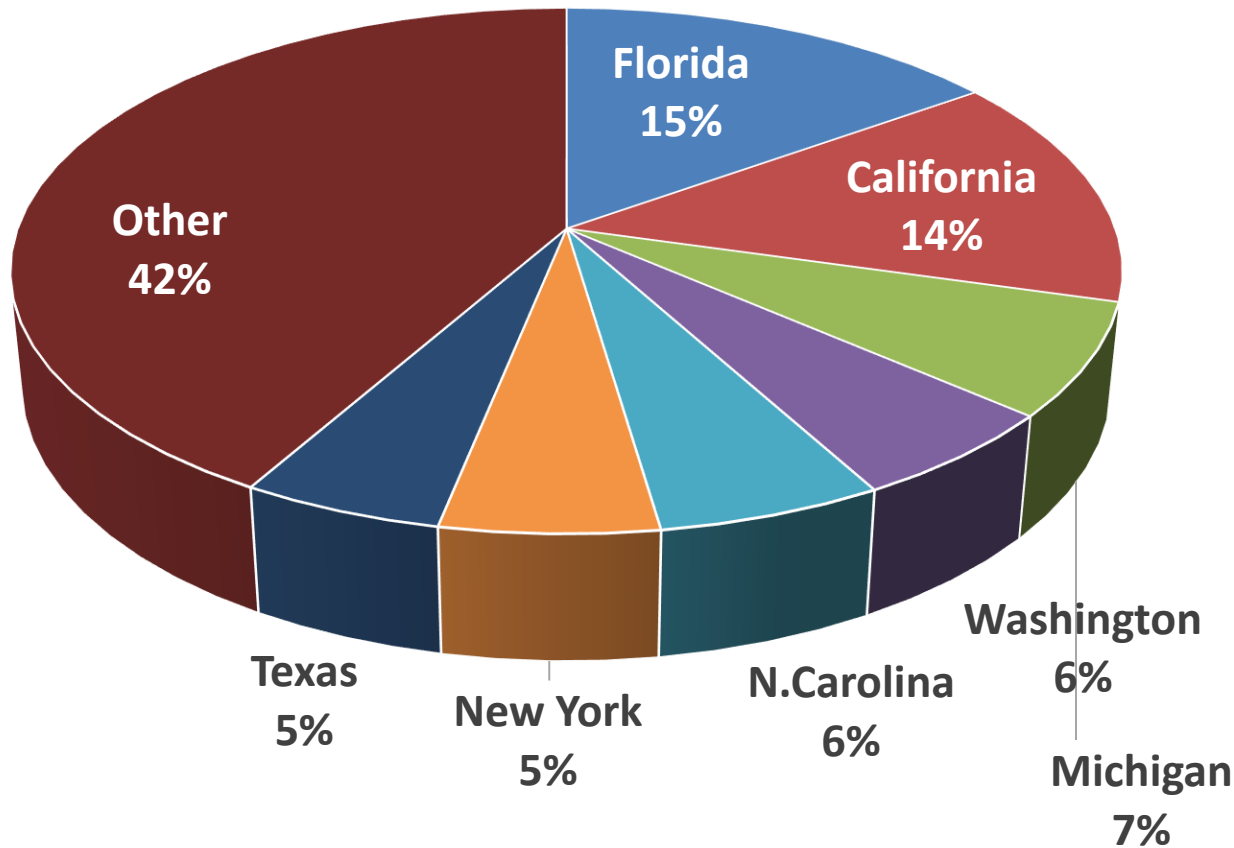
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Specialty Crop Research Initiative, FY02-21*

SCRI Award Dollars: \$946 million FY02-FY22 to all States*
(\$80 million FY21)



Selected Florida Examples

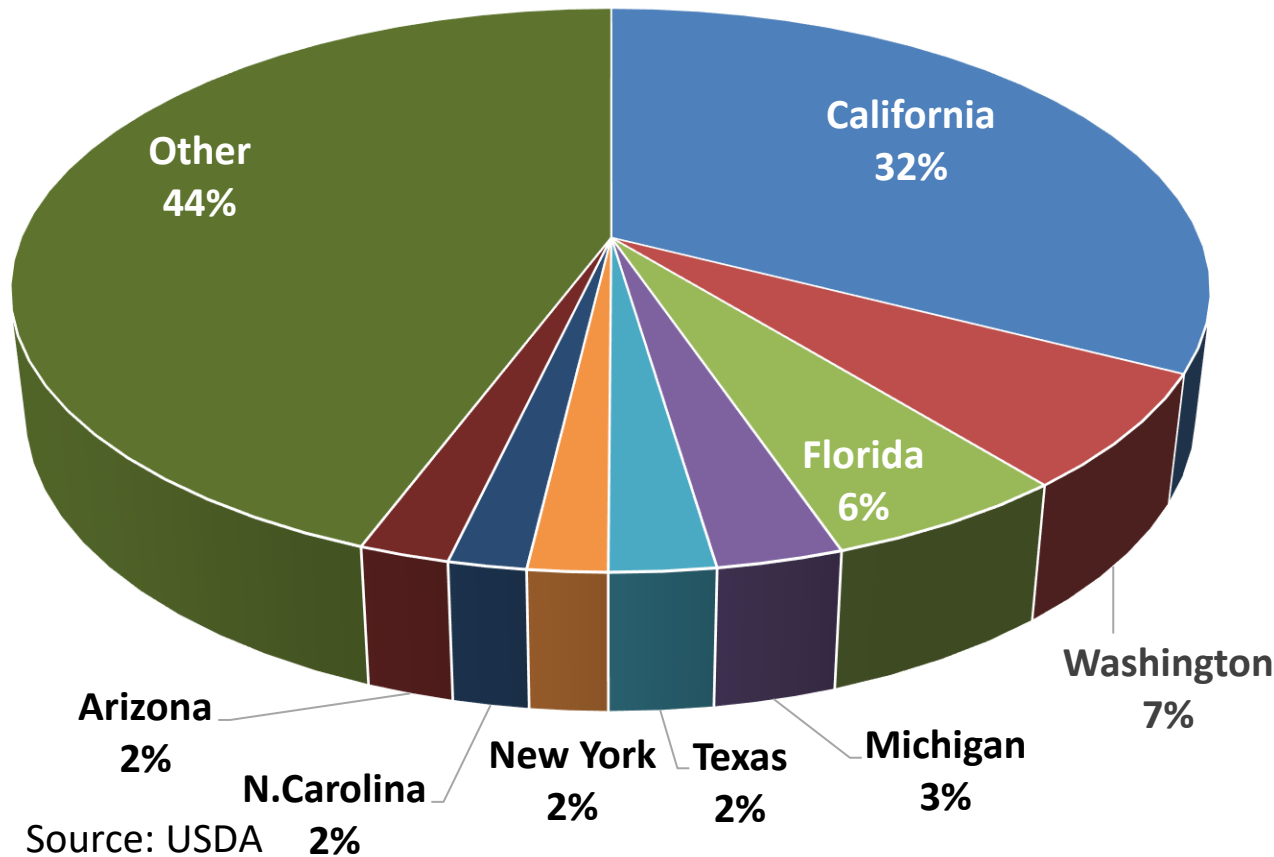
- Laurel Wilt of Avocado
- Psyllids as Biological Control Agents
- Candidate Genes in Citrus-HLB Interactions
- Limiting Losses to Bacterial Spot
- Warm-Season Turfgrass for Sustainable Urban Landscapes
- Sweet corn Production and Marketability
- Emerging Bacterial Diseases of Capsicum
- Implementation of Produce Safety Regulations
- Therapies for Citrus HLB
- Managing Tomato Bacterial Diseases

*Includes Emerging Citrus Disease Program, does not include sub-awards



Specialty Crop Block Grant Program, FY16 - FY22

Specialty Crop Block Grant Award Dollars, FY16 - FY22
 \$583 million FY16-22 to all States; \$73 million FY22



Selected Florida Examples

- Enhance the marketability of Florida-grown fresh blueberries
- Developing a fruiting-wall orchard for peaches
- Insecticides for Management of Asian Bean Thrips on Florida Snap Beans
- Powdery and Downy Mildew Resistant Cucurbits
- Low-chill Blackberry Cultivars
- Smart and Variable Rate Fertilizer for BMPs
- St. Augustine Grass with High Resistance to Gray Leaf Spot
- Greenhouse Cultivated Florida Hops
- Postharvest Storage Life of Caladium Tubers



Some key takeaways

- U.S. and Florida agriculture depends critically on raising productivity for growth and competitiveness
- Productivity growth can also reduce environmental footprint of agriculture
 - less land, fewer GHG emissions per unit of output
- U.S. agricultural productivity has begun to stagnate
 - R&D investment is falling and lagging behind major competitors
 - this puts at risk U.S. agricultural trade competitiveness
 - production becomes more resource intensive

