Future of the Land-Grant University and the College of Agriculture and Life Sciences

VA State Feed Association & Nutritional Management Cow College

February 21, 2013

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Land-Grant University

The land-grant university system is built on behalf of the people, who have invested in these public universities their hopes, support, and confidence." Abraham Lincoln at his signing of the 1862 Morrill Act (Land-Grant College Act)

- Federal legislation of 1862, 1890, and tribal colleges in 1994
- Hatch Act, 1887
- Smith-Lever Act, 1914

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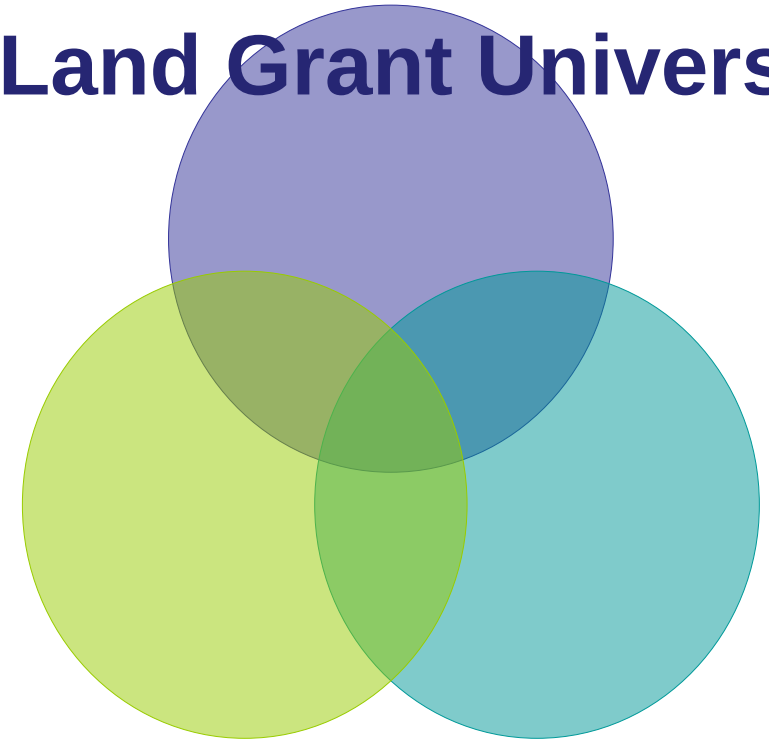
Founded in 1872 as a Land Grant University

TEACHING



RESEARCH

EXTENSION

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- Ranks 28th among US public universities and 71st among all US universities (US News & World Report)
- Colleges
  - **Agriculture & Life Sciences**
  - **Architecture & Urban Studies**
  - **Business**
  - **Engineering**
  - **Graduate School**
  - **Natural Resources & Environment**
  - **Science**
  - **Liberal Arts & Human Studies**
  - **Veterinary Medicine**
  - **Medical (joint with Carilion Health)**

65 bachelor's degree programs

145 masters and doctoral degree programs

More than 3,100 faculty members and researchers

Enrollment

- 23,690 undergraduate students
- 7,316 graduate & professional students
  - 58% male and 42% female
  - 2,269 international (113 countries)
    - 1,807 graduate; 462 undergraduate

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College of Agriculture & Life Sciences

- 2,700 undergraduate students
- 500 graduate students
- Ag Sciences research expenditure is ranked in top 10 nationally by NSF
- Sponsored awards $45M
- Virginia Cooperative Extension and the Agricultural Experiment Station are major components of the College

CALS Academic Departments

- Ag Technology (2 Year)
- Agricultural and Applied Economics
- Agricultural and Extension Education
- Animal and Poultry Sciences
- Biochemistry
- Biological Systems Engineering
- Crop and Soil Environmental Sciences
- Dairy Science
- Entomology
- Food Science and Technology
- Horticulture
- Human Nutrition, Foods and Exercise
- Plant Pathology, Physiology, and Weed Science

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Virginia Agricultural Experiment Station

and its

Agricultural Research and Extension Centers

- Virginia Agricultural Experiment Station - *Blacksburg*
- Alson H. Smith, Jr. AREC - *Winchester*
- Eastern Shore AREC - *Painter*
- Eastern Virginia AREC - *Warsaw*
- Hampton Roads AREC - *Virginia Beach*
- Middleburg AREC - *Middleburg*
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- Tidewater AREC - *Suffolk*
- Virginia Seafood AREC - *Hampton*

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College of Agriculture and Life Sciences

Virginia Agricultural Experiment Station

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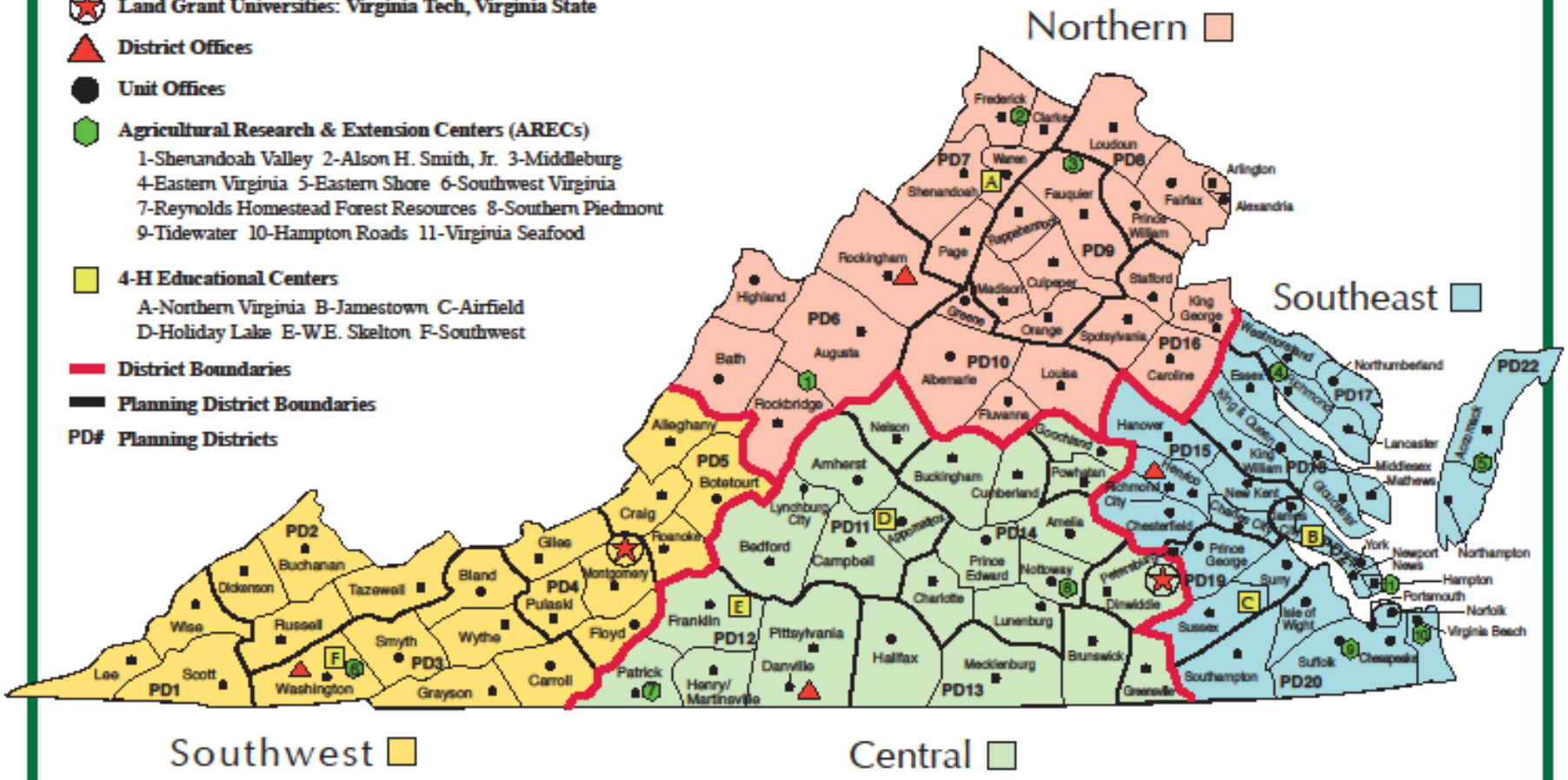
Virginia Cooperative Extension

Publication AREC-4
Revised November 2011

- **Land Grant Universities: Virginia Tech, Virginia State**
- **District Offices**
- **Unit Offices**
- **Agricultural Research & Extension Centers (ARECs)**
  1-Shenandoah Valley 2-Alson H. Smith, Jr. 3-Middleburg
  4-Eastern Virginia 5-Eastern Shore 6-Southwest Virginia
  7-Reynolds Homestead Forest Resources 8-Southern Piedmont
  9-Tidewater 10-Hampton Roads 11-Virginia Seafood
- **4-H Educational Centers**
  A-Northern Virginia B-Jamestown C-Airfield
  D-Holiday Lake E-W.E. Skelton F-Southwest
- **District Boundaries**
- **Planning District Boundaries**
- **PD# Planning Districts**



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www.ext.vt.edu

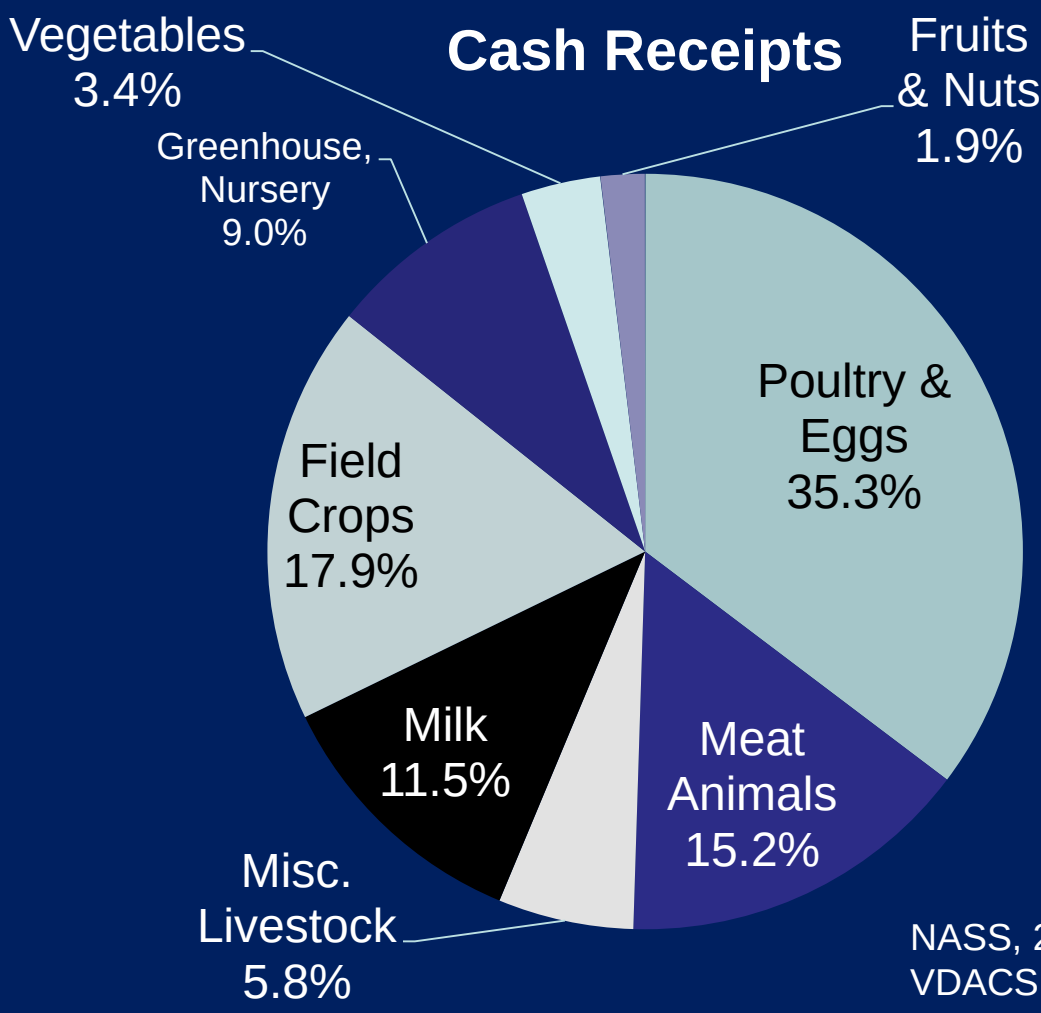
VT/0211/1111/W/AREC-4

Virginia Depends on Agriculture

$55 Billion Industry
357,000 jobs

VA Commodities & Products that rank in top 10 of all U.S. States:

Tomatoes (fresh market)
Tobacco (leaf)
Turkeys
Apples
Potatoes (summer)
Beans (snap)
Grapes
Peanuts
Broilers
Cucumbers (fresh market)



NASS, 2010
VDACS, 2011-12

Grand Challenge - Food, fiber, feed, and fuel for 9 billion people by 2050

- Abundant yields (genetics, technology, improved agronomics….input costs, environmental footprints, efficiency of water use)
- Managing pests, pathogens, and invasive plants
- Adaptation to climate variation
- Producing safe & nutritious food; reducing food waste
- Managing alternative energy production
- Adequate workforce at all levels

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CALS Strategic Plan

MISSION:

The College creates, integrates and shares knowledge to enhance:

- life sciences, food and agricultural systems
- the economic prosperity and life quality of the greater community
- the stewardship and health of land, water, and air for future generations
- student learning through diverse, hands-on experiential opportunities

VISION:

We address current and emerging issues in agricultural and life sciences, by building on the land grant commitment of developing leaders and creating and sharing knowledge through diverse hands-on applications.

CALS Strategic Plan

Goal 1: Provide a comprehensive agricultural and life sciences undergraduate and graduate educational experience

Goal 2: Strengthen Discovery capabilities to successfully address local, state, national and global needs

Goal 3: Develop and disseminate science-based knowledge and innovative services through engagement with stakeholders and partners

Goal 4: Create a stable and sustainable resource portfolio for the college and seek continuous improvement in organizational effectiveness

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CALS Strategic Plan

Focus Areas:

Agricultural Profitability and Environmental Sustainability

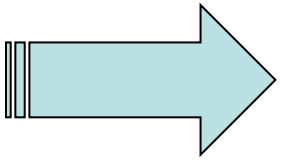
Food, Nutrition, and Health

Biodesign and Bioprocessing

The Green Industry

Infectious Diseases

Community Viability



Emphasis Areas:

Safe and Sustainable Food Systems

Aging Healthfully

Climate-Induced Environmental Change

Bioprocessing/Bioenergy and Bio-Products

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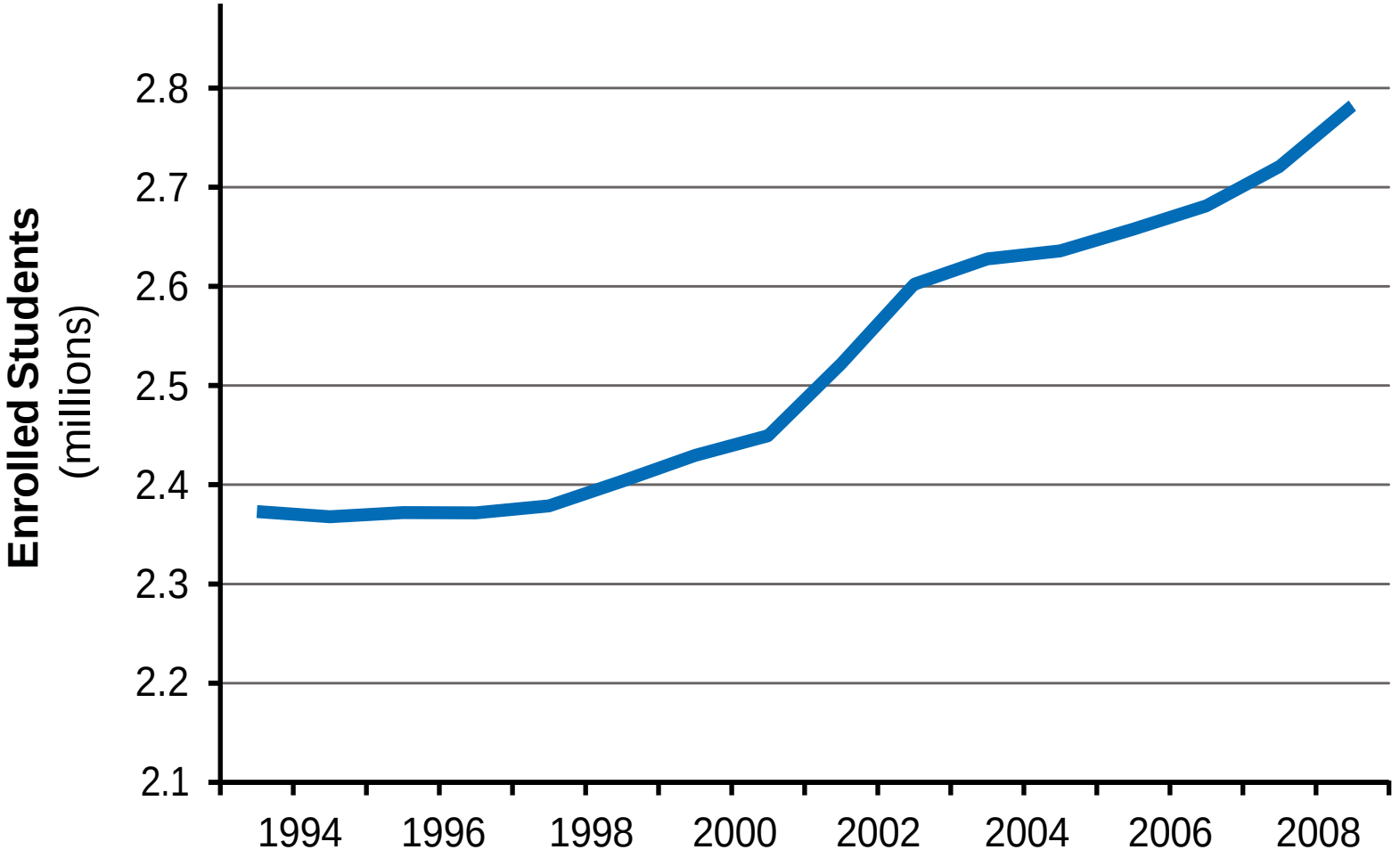
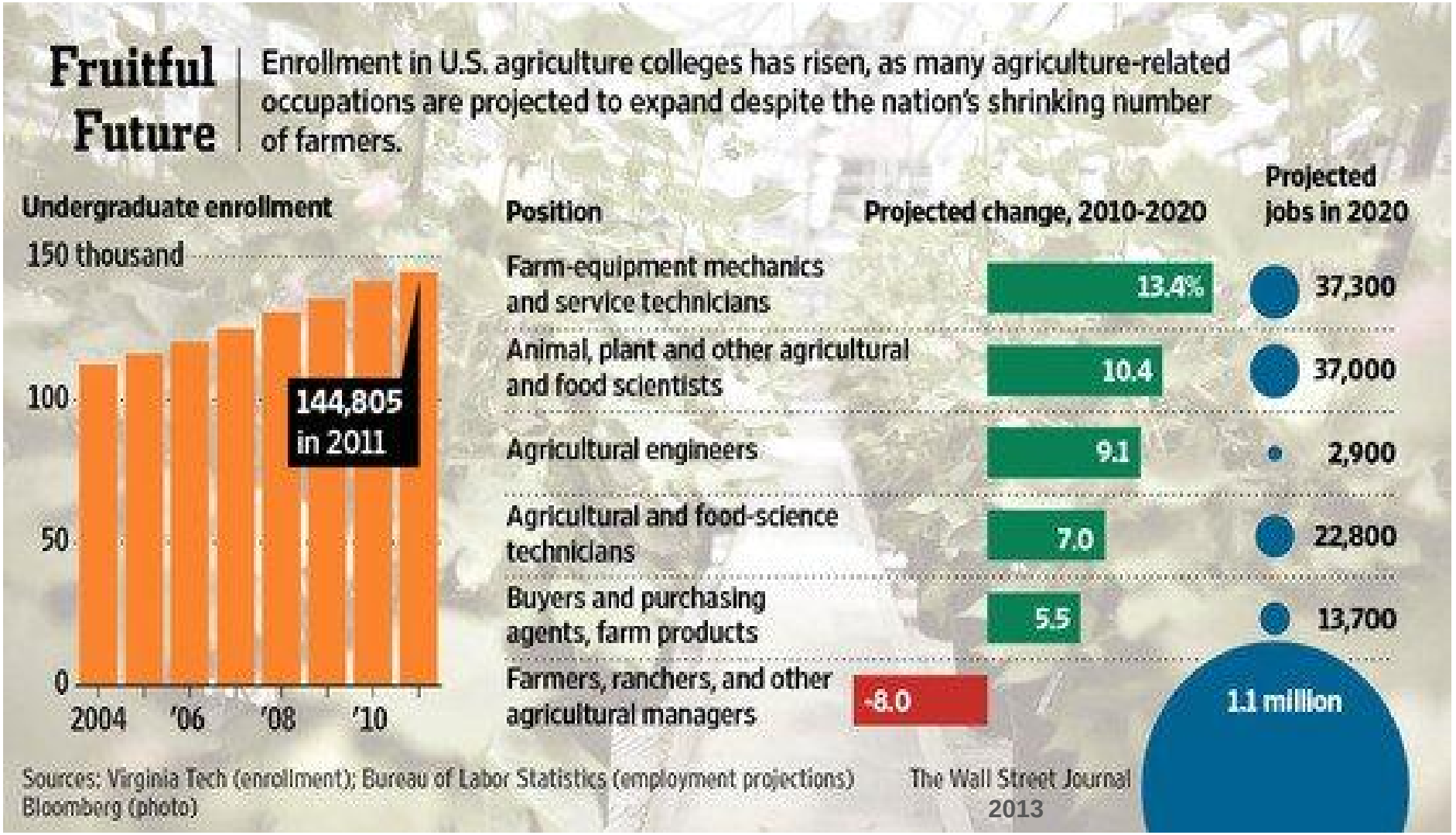
Student Enrollment in Major Public Research Universities

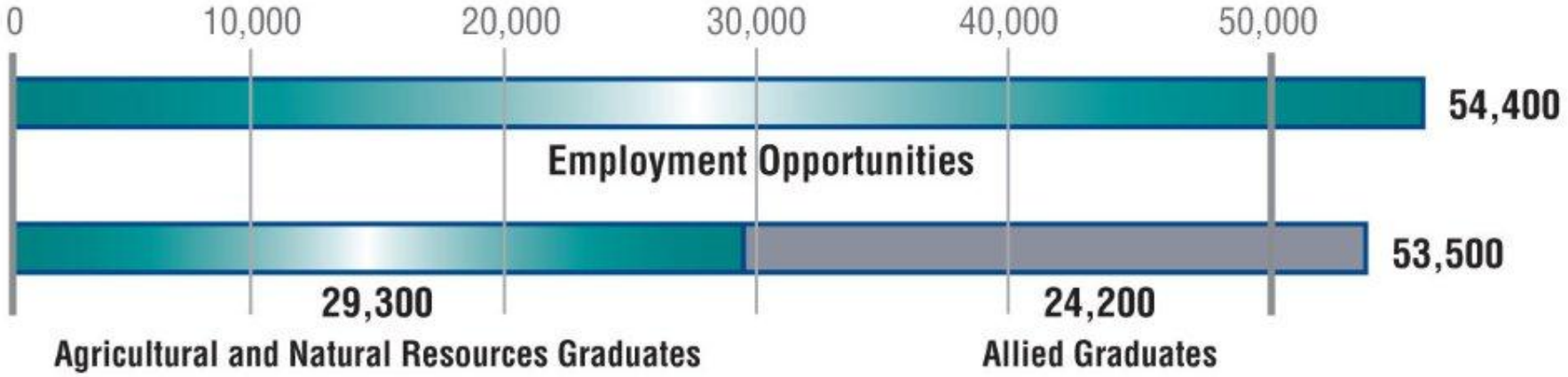


NSF, 2012

Growing demand for ag graduates will continue…



Ag graduates are in demand…

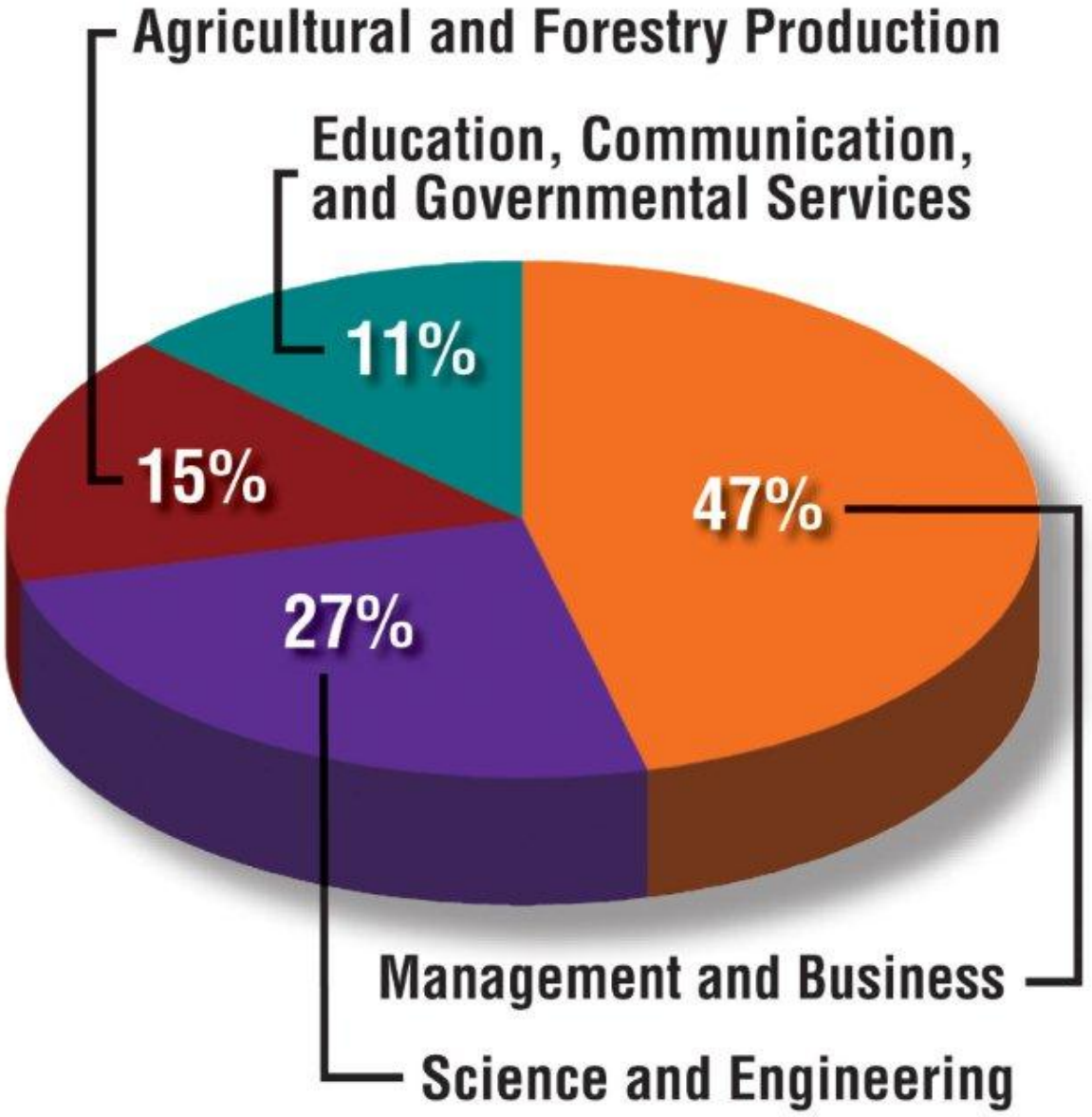


Factors shaping the market:

- Macroeconomic conditions and retirements
- Consumer preferences for nutritious and safe foods
- Food, energy, and environment public policy choices
- Global market shifts in population, income, food, and energy

USDA, 2010

Employment Opportunities

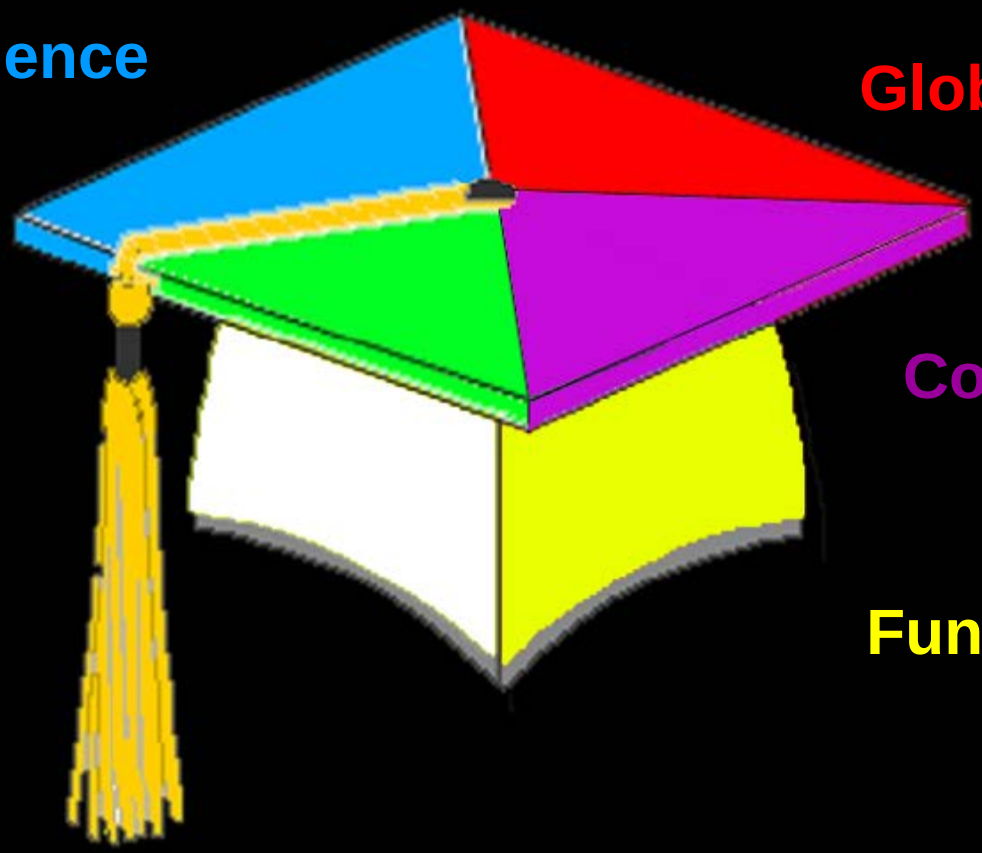


USDA, 2010

Complete Graduate

Experience

Global Awareness



Service Learning

Communication

Critical Thinking

Fundamentals

Interpersonal Skills

Student Success

- Recruitment/Development/Retention
- Products:
  - engaged alumni
  - community leaders
  - world citizens

- Contribution to economic development

CALS Students

- 2,700 total undergraduate students
  - 481 incoming Freshmen – Fall 2012
  - 126 transfer students – Fall 2012
- ~500 total graduate students

- Future growth to 3,000 undergraduate and 850 graduate students

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Agriculture & Life Science Research Programs

Discovery that **expands** the realm of **knowledge** and **develops solutions** to problems relevant to the agriculture, food, health, and natural resources sectors

Quality of Life

Economic Development

Student Learning Experiences


Johal
Corn rootworm susceptible mutant


Johnson
Giant ragweed plants surviving herbicides


Beckerman: Apple Scab

Discovery to Delivery

- **Infrastructure Investments**
  - **People – faculty & staff**
    - **Established senior scientists vs Early career high-achievers**
  - **Facilities**
    - **An environment conducive for success**
    - **State-of-the-art facilities**
  - **Interdisciplinary teams**
    - **Grand challenges require grand approaches**
    - **Requires strong single disciplines**
    - **Removal of barriers at all levels**
  - **Funding**
    - **New approaches**
    - **Industry partnerships**
      - **R&D outsourcing growth**
    - **Multi-institutional (domestic & international)**

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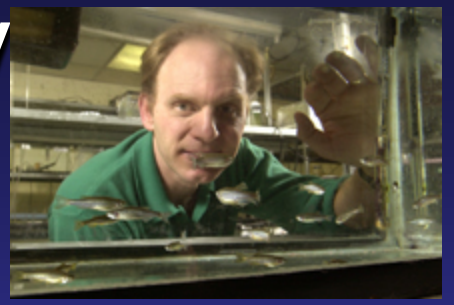
CALS faculty

- **Tenured/tenure-track faculty**
  - July 2010 – 178
  - Currently – 212
    - Includes 26 at ARECs (5 new AREC hires since 2010)
  - August 2013 – anticipate 226
    - Anticipate 27 at ARECs
- **Field extension faculty**
  - July 2010 – 179
  - Currently – 230 (searches underway)

Discovery to Delivery



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Human & Agricultural Biosciences Building 1

LORD · AECK · SARGENT
ARCHITECTURE

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HUMAN AND AGRICULTURAL BIOSCIENCES BUILDING ONE

SOUTHEAST PERSPECTIVE

Virginia Agricultural Experiment Station

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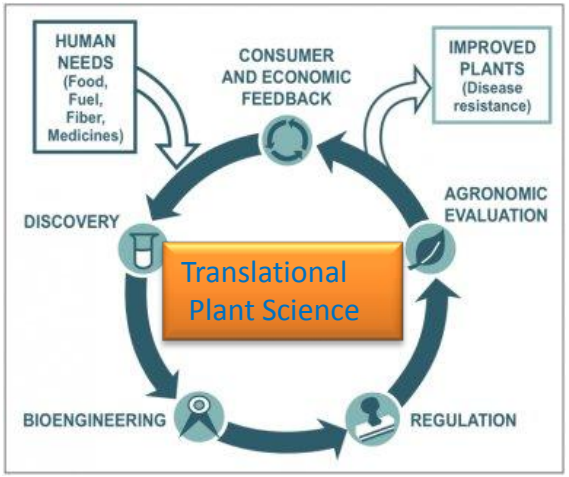
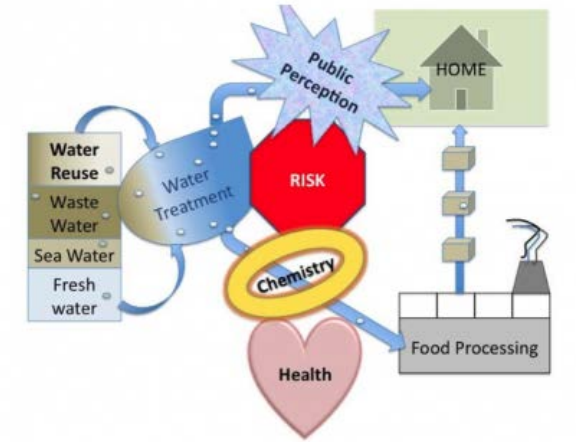
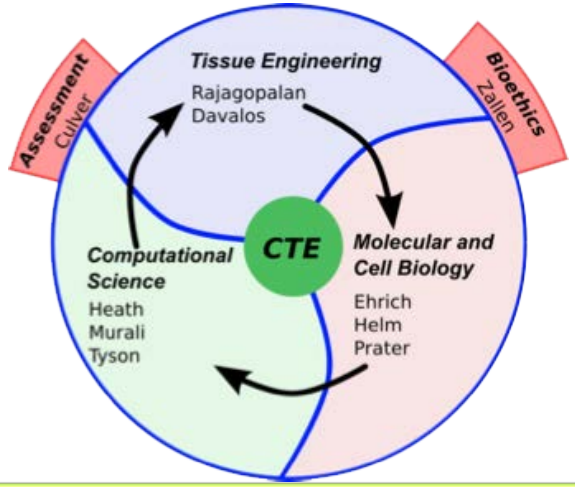
Interdisciplinary Graduate Education Programs



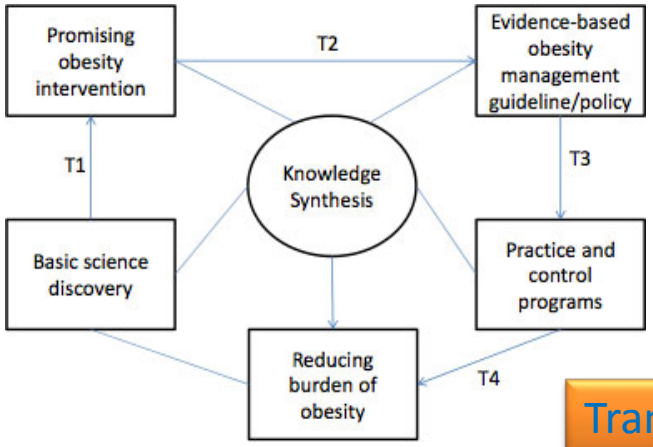
Genetics, Bioinformatics and Computational Biology



Water Interface



Computational Tissue Engineering



Translational Obesity

Examples of Regional Collaboration

- Peanut Variety Quality Evaluation
- Viticulture for the mid-Atlantic
- Irrigation pathogens
- Box Blight
- Pasture-based beef production for Appalachia
- Seafood safety training

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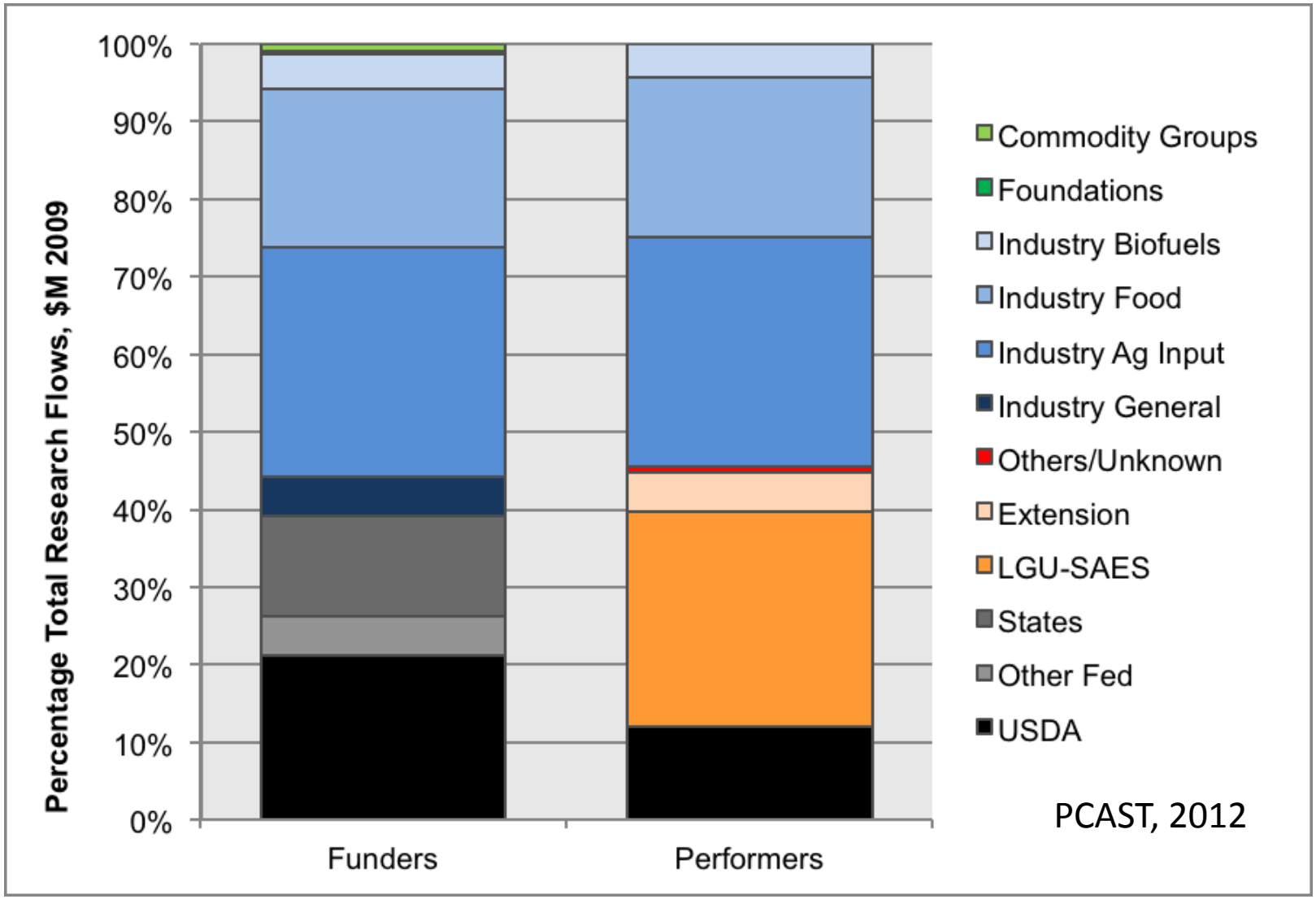
Total U.S. agriculture and food research, development, and extension expenditures by research funder and performer for 2009

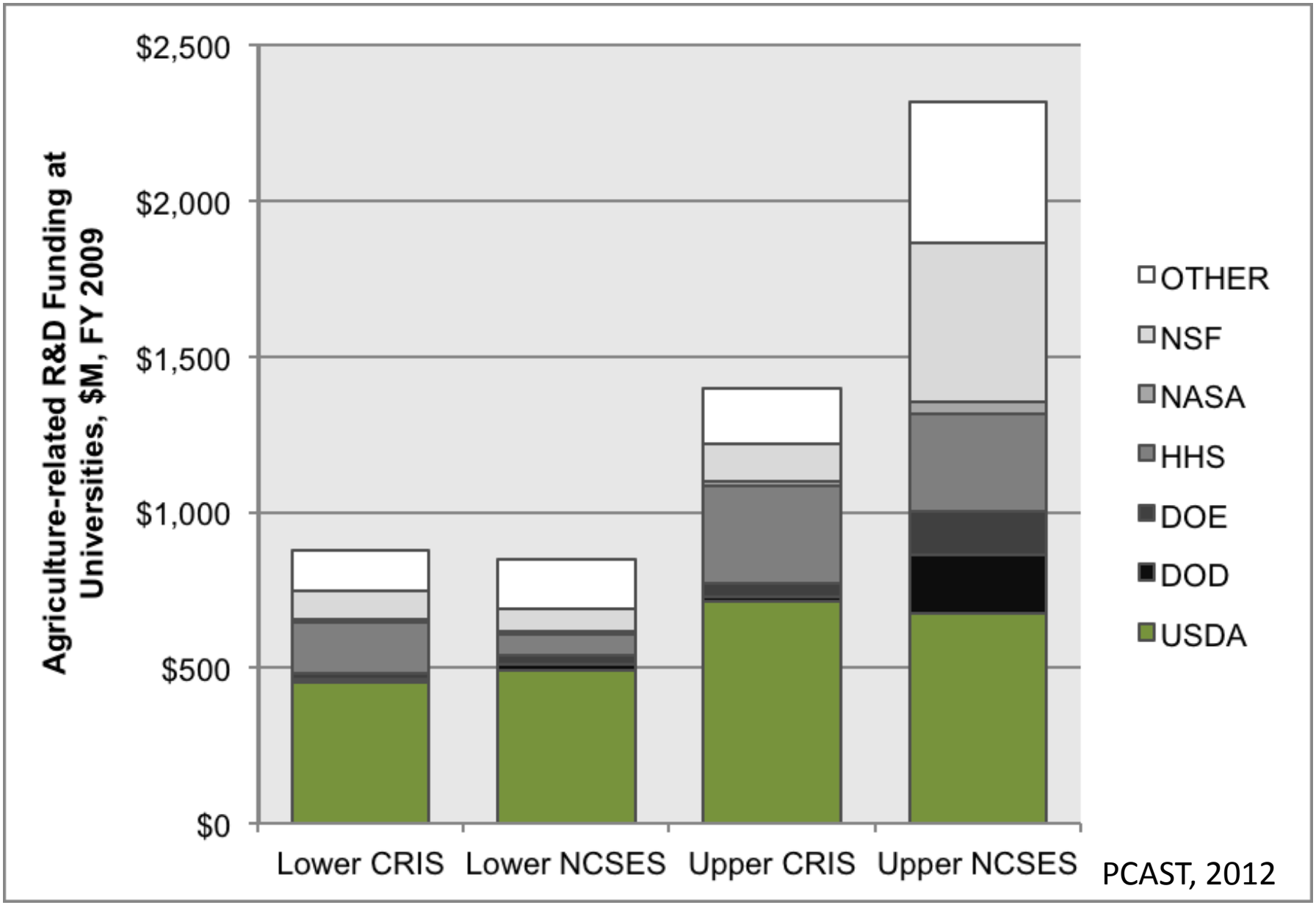
Public entities fund 39% and perform 46% of ag research.
Private entities fund 61% and perform 54% of ag research.



PCAST, 2012

Federal funding of agriculture-related research to universities

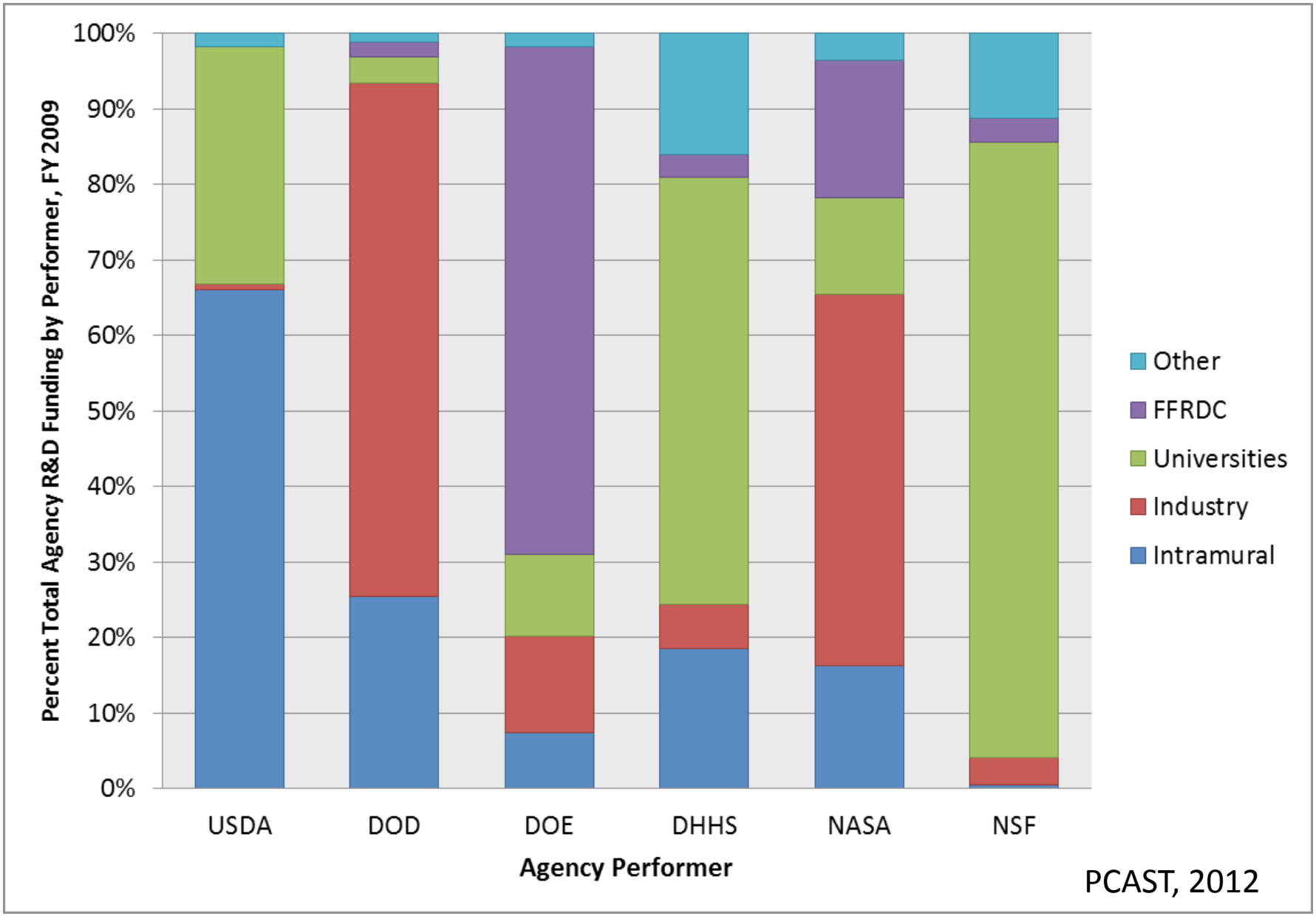
Lower bound = ag research; Upper bound = both ag and biological research



PCAST, 2012

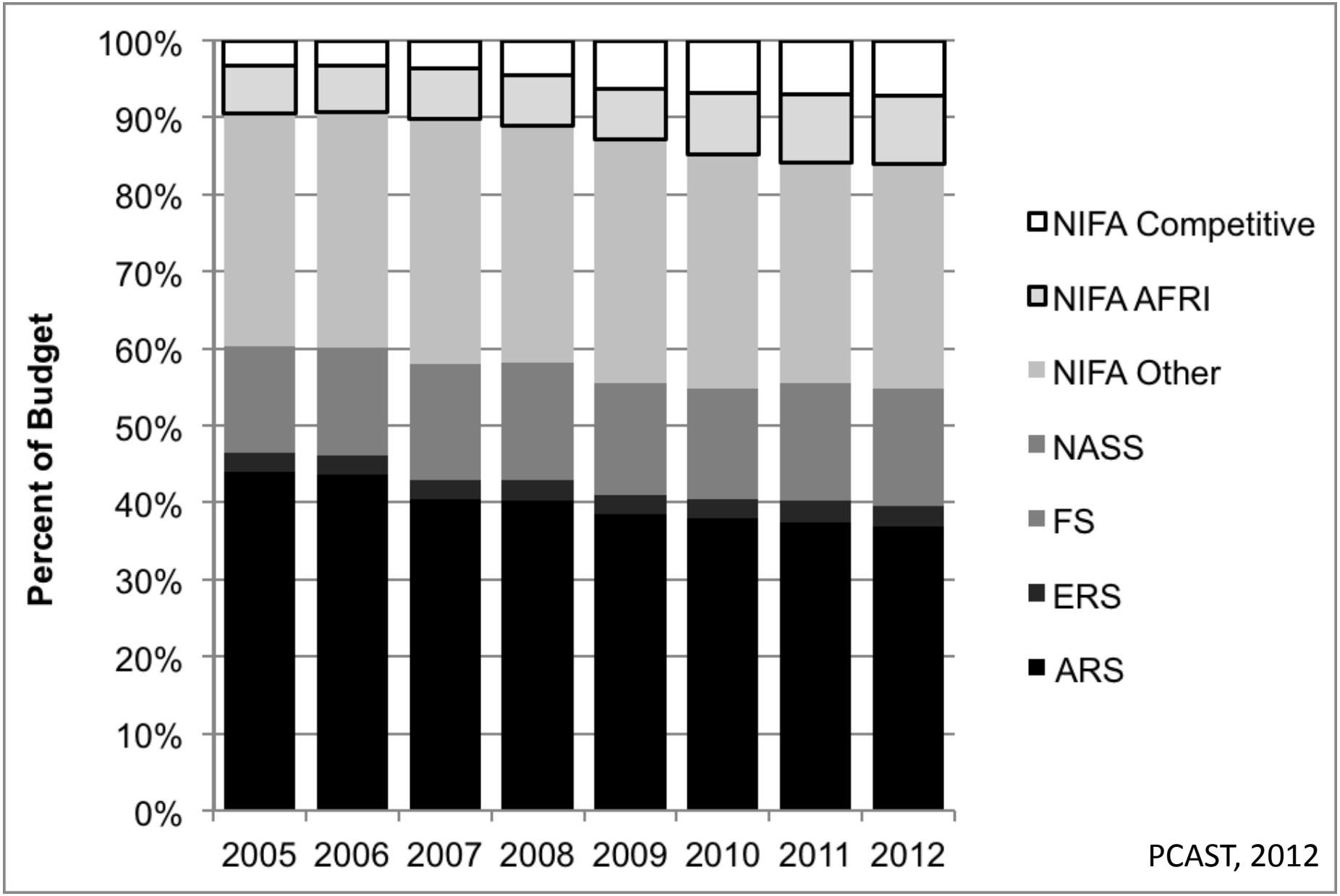
Distribution of the R&D portfolio across Federal funders of ag research

USDA $2.3B, DOD $68B, DOE $9.9B, DHHS $36B, NASA $5.9B, and NSF $6.1B.



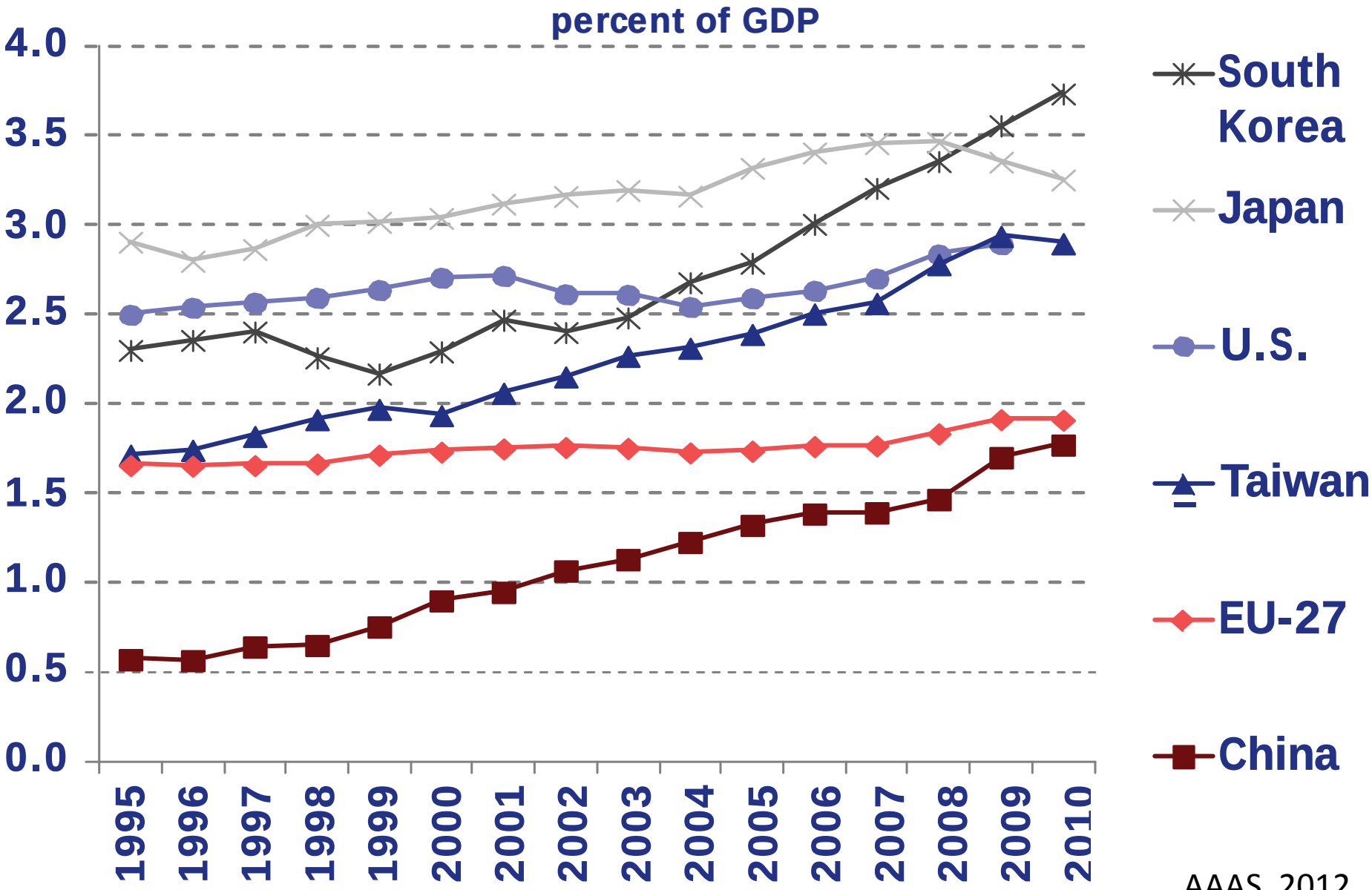
PCAST, 2012

USDA Research, Education, and Economics (REE) Funding



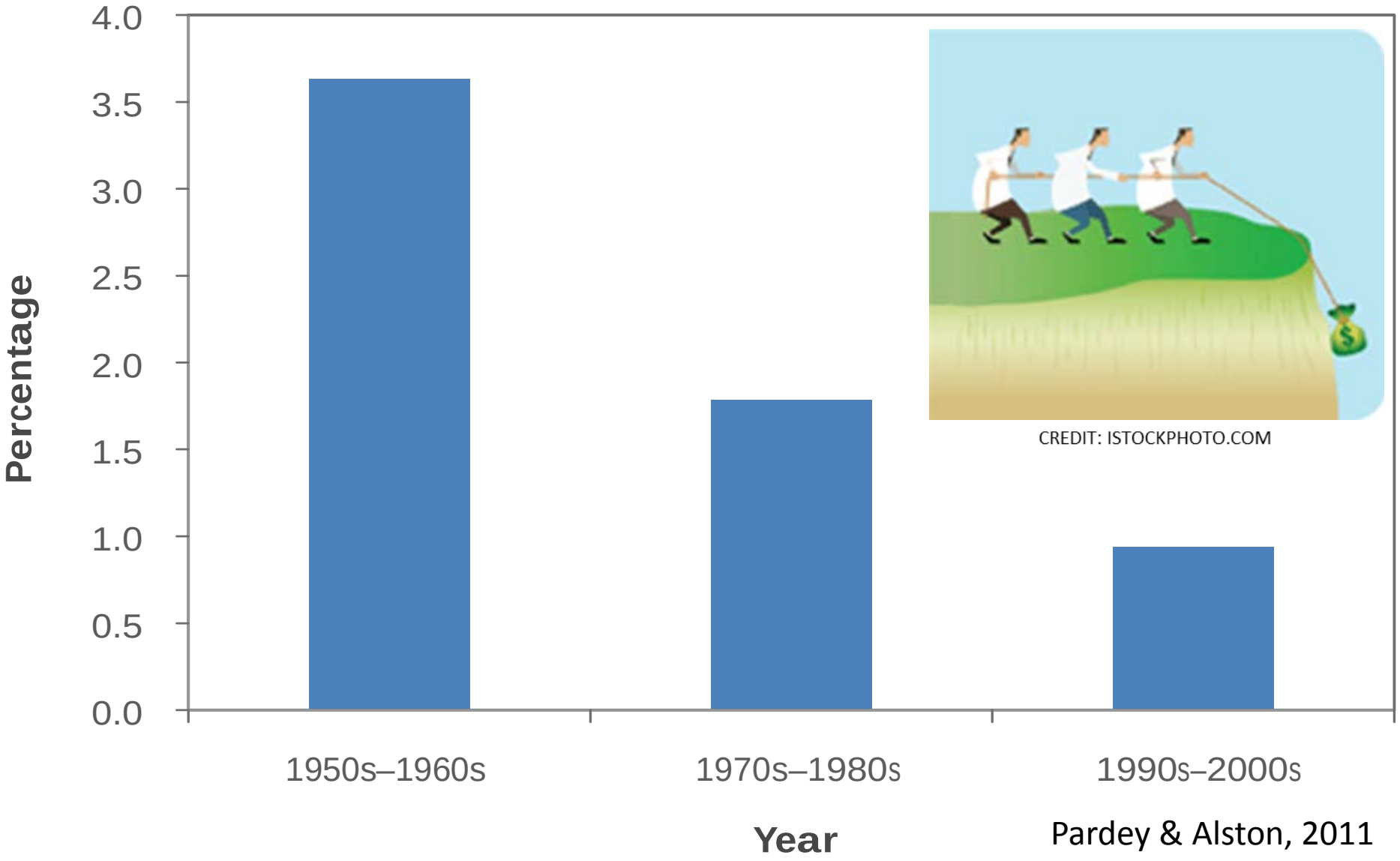
PCAST, 2012

National R&D Investment



AAAS, 2012

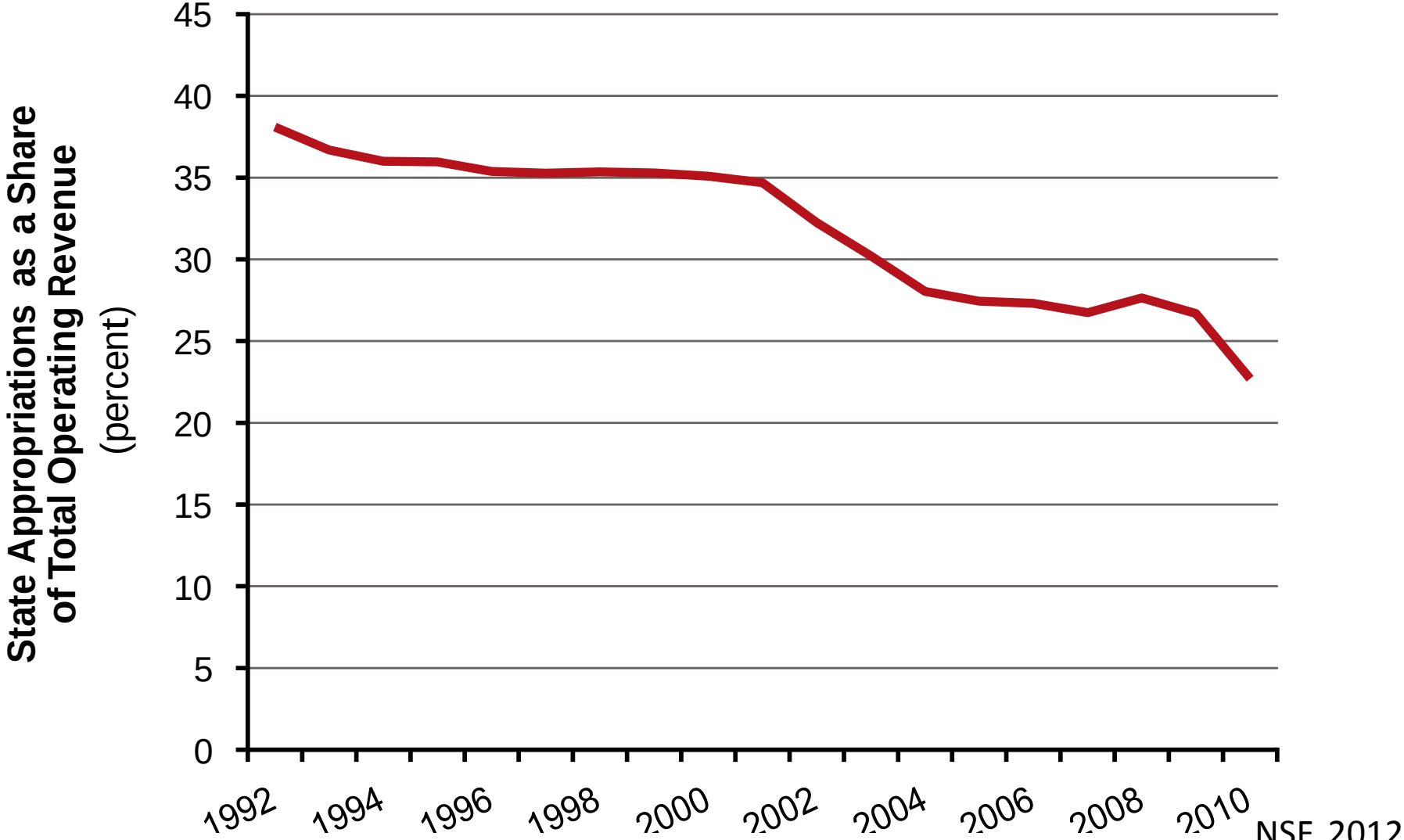
Agricultural Research Spending Slowdown



CREDIT: ISTOCKPHOTO.COM

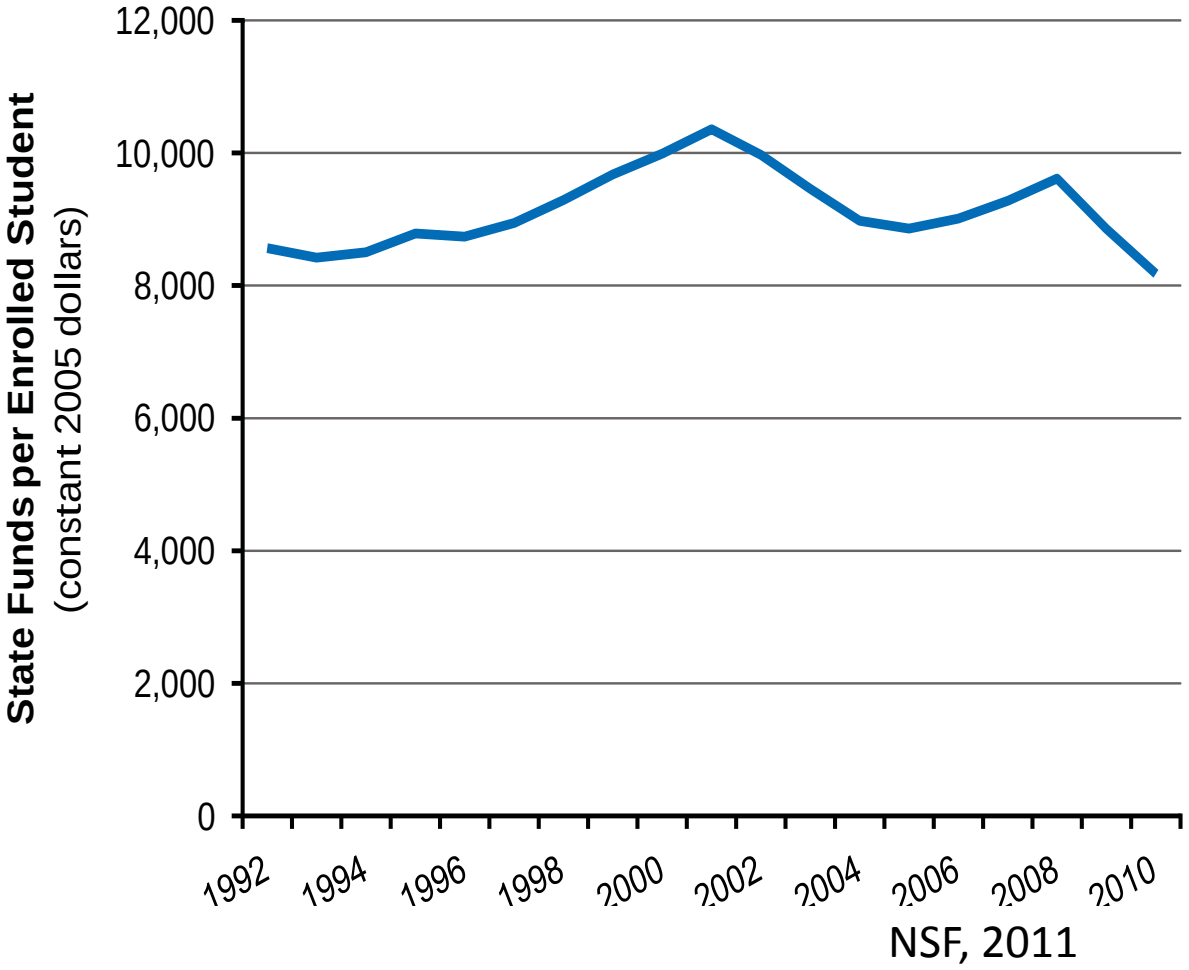
Pardey & Alston, 2011

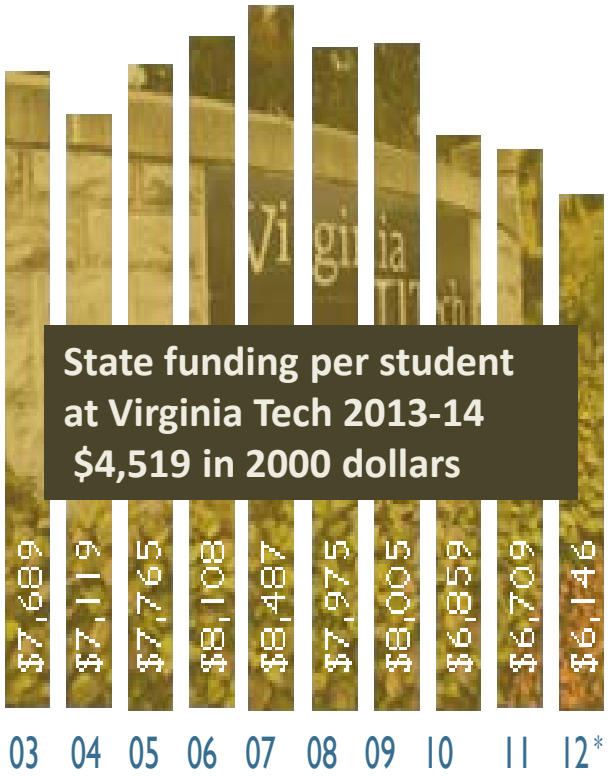
State Appropriations at Public Research Universities



NSF, 2012

State Appropriation has Failed to Keep Pace





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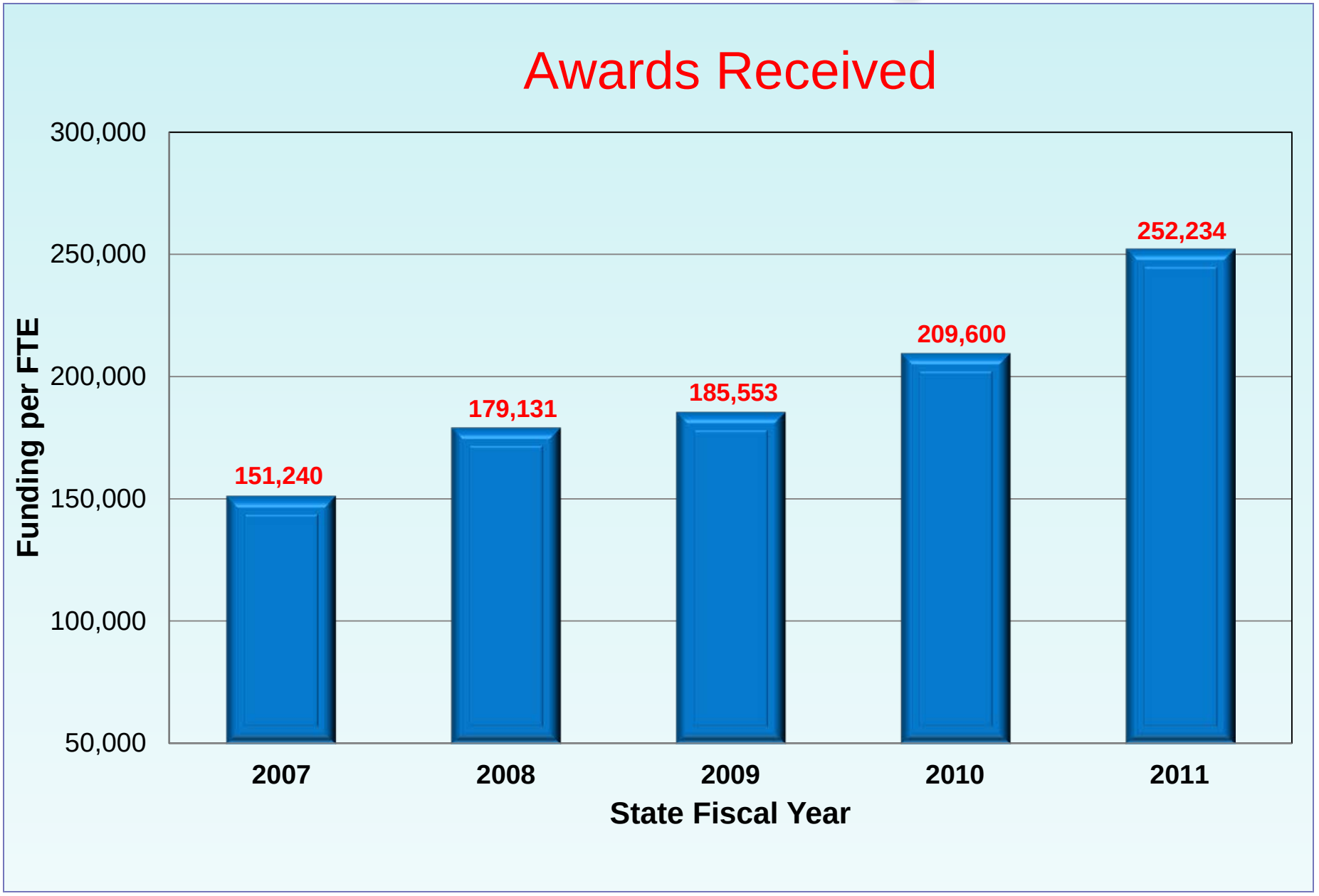
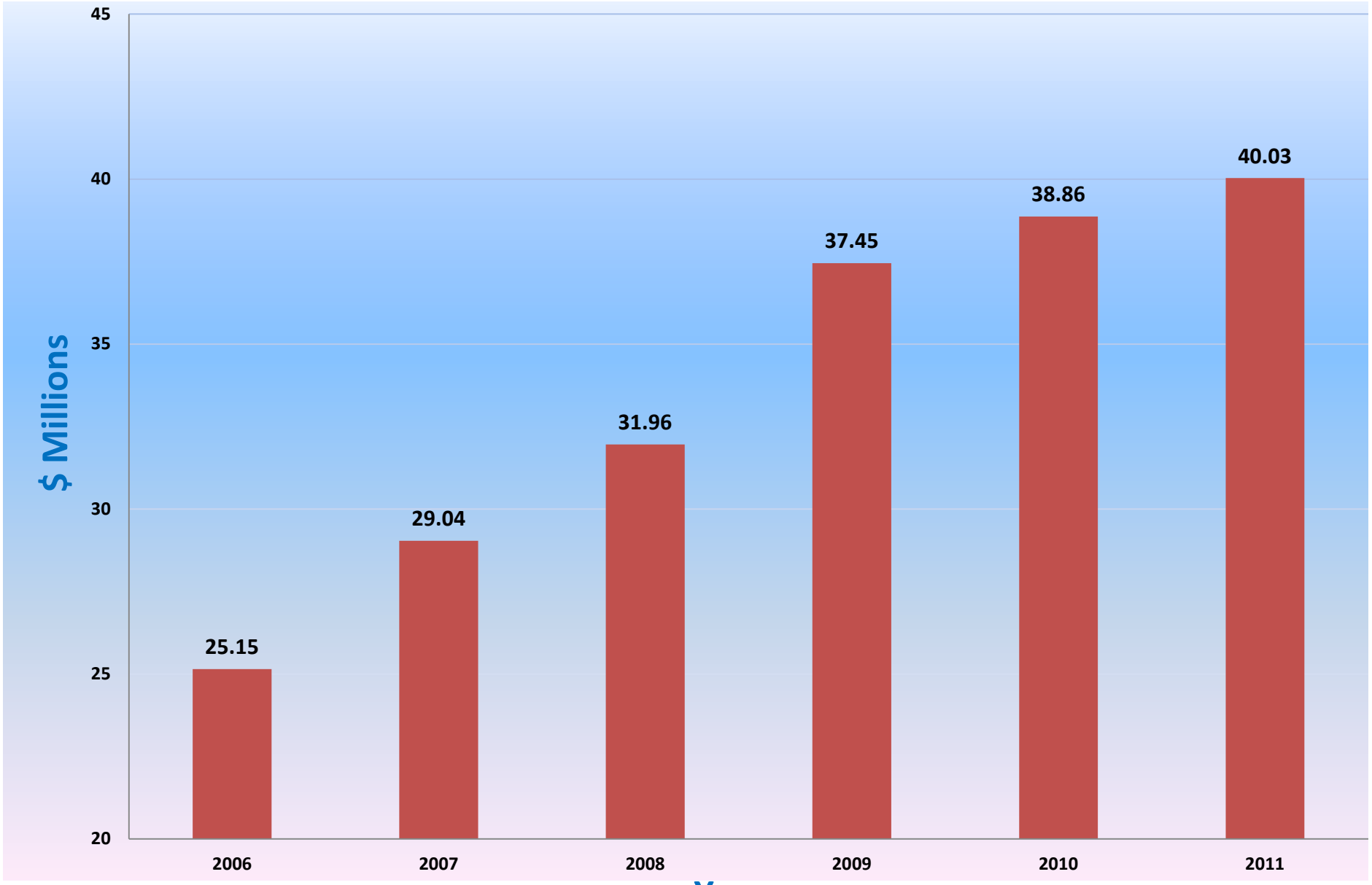
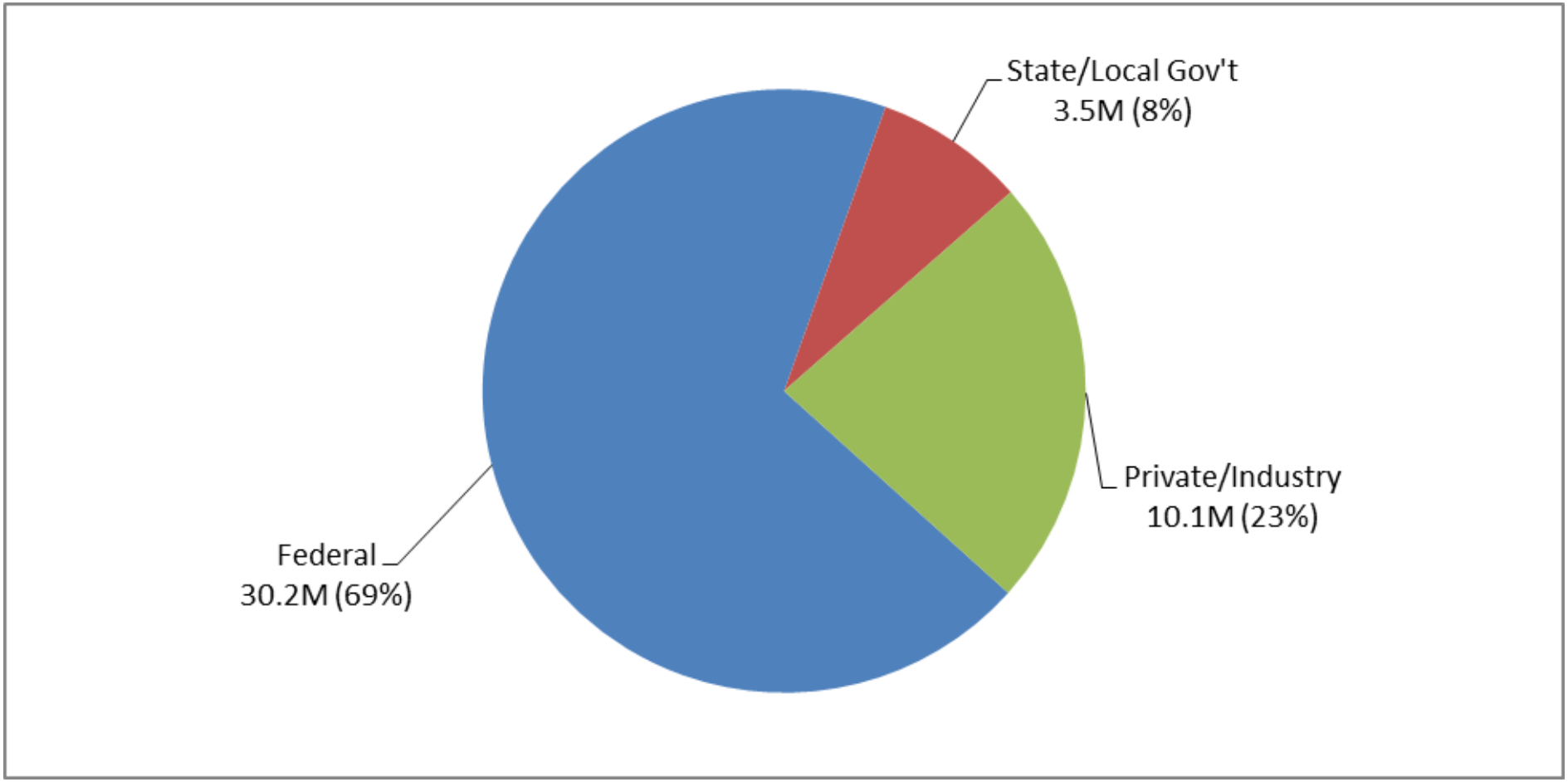
CALS External Funding/FTE



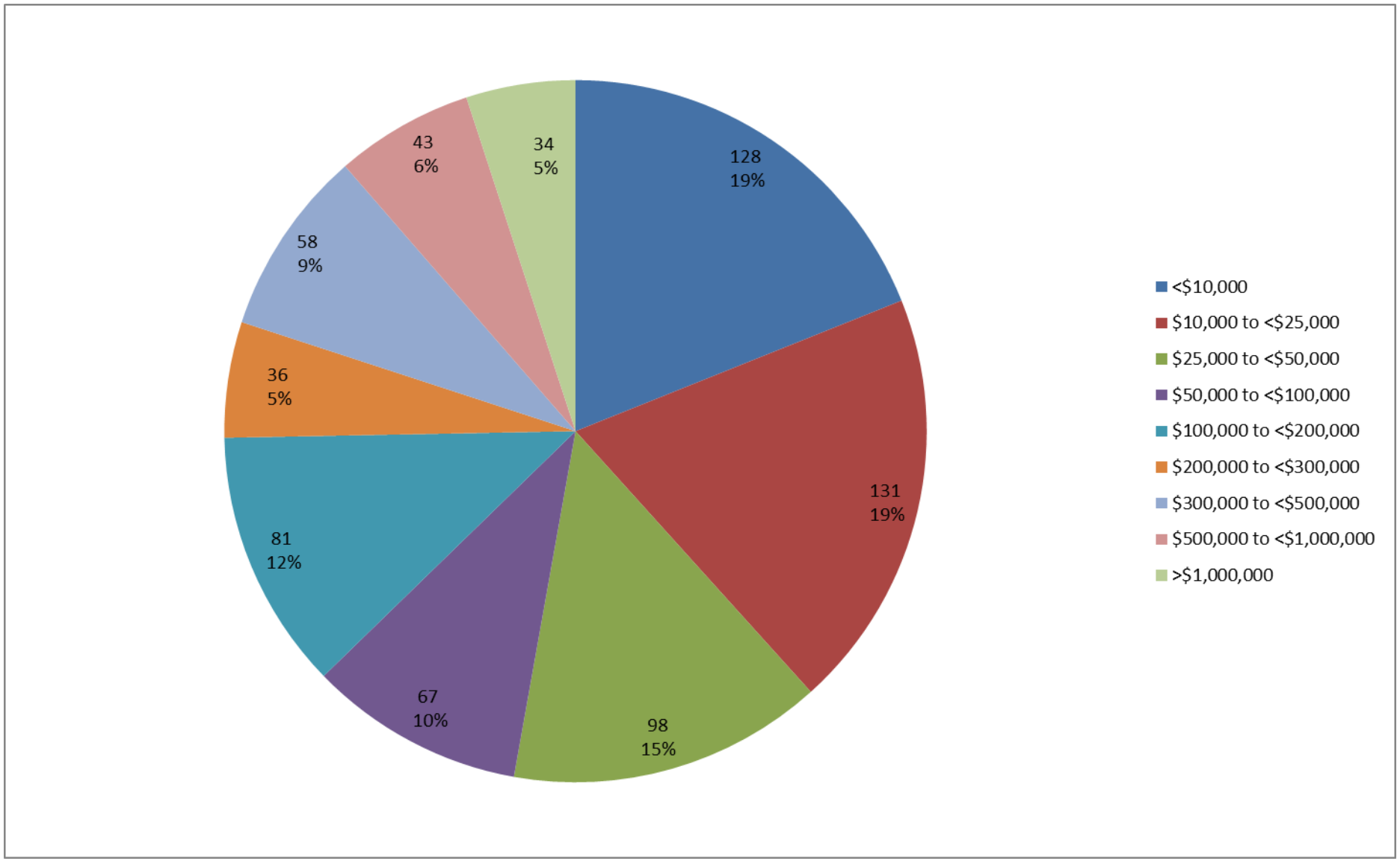
CALS Research Expenditure Growth



Sources of CALS Research Awards
FY 2012



Distribution of CALS Proposals by Size Fiscal Year 2011



Addressing the Grand Challenges of Agriculture

Strategically grow the education & research programs at our land-grant universities

Increase the integration of the land-grant missions

Expand partnerships internally and externally

Adopt new funding models

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Thank you!

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