2010 ESS/SAES/ARD Meeting and Workshop

Presentations:

Orlando McMeans - Research Strengths at 1890 Universities

Alton Thompson - North Carolina A&T's Center of Excellence in Post-Harvest Technologies: An Equitable 1890-1862 Partnership

Walter Hill - Partnering for Mutual Benefit

Science Roadmap Challenge Areas

Steve Slack/Mike Harrington - Challenge I: Sustainability, Competitiveness, and Profitability

Mike Hoffmann - Challenge II: Climate Change

Steve Pueppke - Challenge III: Energy and the Bio-Economy

John Liu - Challenge IV: Safe, Secure, and Abundant Food Supply

Josef Kokini - Challenge V: Human Health, Nutrition, and Wellness

Steve Meredith - Challenge VI: Environmental Stewardship

Bo Beaulieu - Challenge VII:Individual, Family, and Community Development

---

Roger Beachy - NIFA's Vision

Ed Knipling - ARS' Vision

Sanjiv Singh - Developing and Managing Large Integrated Grants

Robert MacDonald - Documenting Impacts

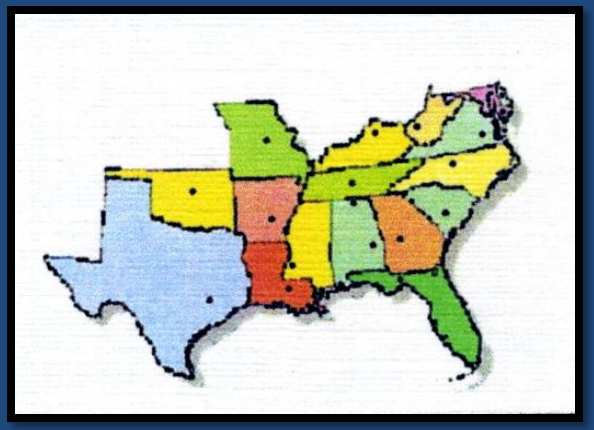
William Brown - Best Practices Example

Steve Pueppke - Best Practices Example

The 1890 Land-Grant System: An Indispensable Investment

ESS/SAES/ARD Annual Meeting and Workshop
Nashville Hilton Downtown, Nashville, TN
September 28, 2010

Presenter:
Orlando F. McMeans, ARD Chair



A Little History:

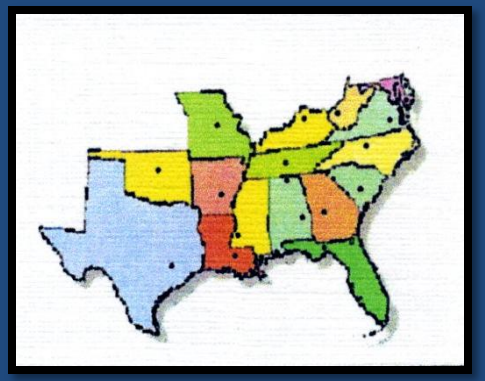
The Second Morrill Act of 1890 provided that **“no money shall be paid out under this Act to any State or Territory for the support and maintenance of a college where a distinction of race or color is made in the admission of students.”**

However the Act was revised to say that **in states that refused to admit colored students, they could establish separate colleges for white and colored students so long as the funds received would** “be equitably divided.”

So, in 1890 ……

➢The 1862 institutions in 17 states would not admit colored students, leading to the establishment of:

Seventeen 1890 land grant universities and, because of its strong history relating to agricultural education, Tuskegee Institute (a private black college) became the 18th of the historically black land grant colleges.



The 1890s are located in the **Southern Region**, with these exceptions:

Northeast Region:

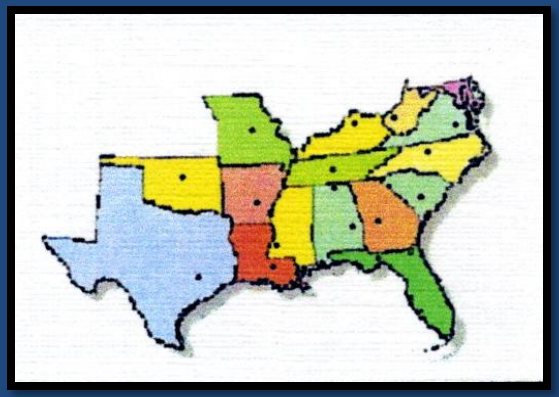
Delaware – Delaware State University

Maryland – University of Maryland Eastern Shore

West Virginia – West Virginia State University

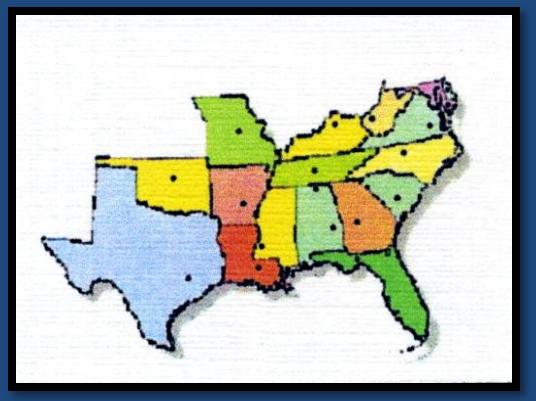
North Central Region:

Missouri – Lincoln University



The 1890 Institutions

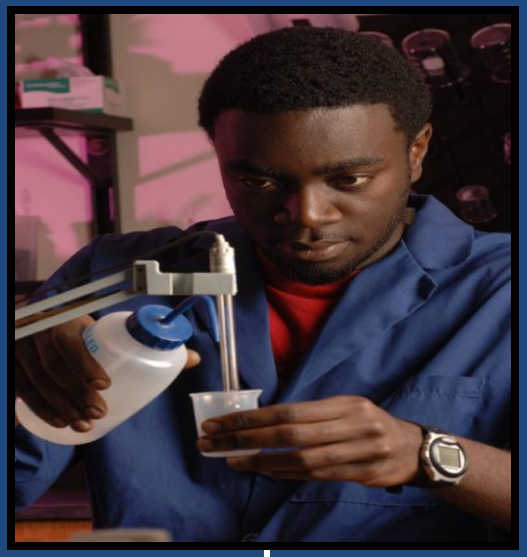
- Alabama – Alabama A&M University and Tuskegee University
- Arkansas – University of Arkansas at Pine Bluff
- Delaware – Delaware State University
- Florida – Florida A&M University
- Georgia – Fort Valley State University
- Kentucky – Kentucky State University
- Louisiana – Southern University
- Maryland – University of Maryland Eastern Shore
- Mississippi – Alcorn State University
- Missouri – Lincoln University
- North Carolina – North Carolina A&T State University
- Oklahoma – Langston University
- South Carolina – South Carolina State University
- Tennessee – Tennessee State University
- Texas – Prairie View A&M University
- Virginia – Virginia State University
- West Virginia – West Virginia State University



The 1890 Institutions

Date	Institution	Sponsor
1866	Lincoln University	Civil War Negro Infantry
1871	Alcorn State University	State Legislature
1872	South Carolina State University	State Legislature
1873	University of Arkansas Pine Bluff	State Legislature
1875	Alabama A&M University	Group of Ex-Slaves
1876	Prairie View A&M University	State Legislature
1880	Southern University	State Legislature
1881	Tuskegee University	State Legislature
1882	Virginia State University	State Legislature
1886	Kentucky State University	State Legislature
1886	University of Maryland Eastern Shore	Methodist Episcopal Church
1887	Florida A&M University	State Legislature
1891	Delaware State University	State Legislature
1891	North Carolina A&T University	State Legislature
1891	West Virginia State University	State Legislature
1895	Fort Valley State University	Citizens' Group
1897	Langston University	Territorial Legislature
1909	Tennessee State University	State Legislature

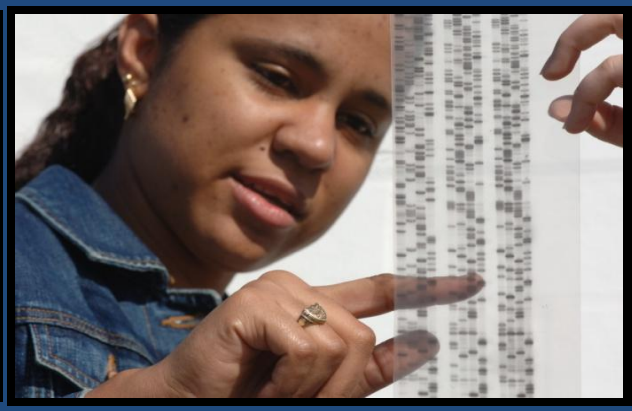
The eighteen 1890 Land Grant Universities were founded between 1866 and 1912



All eighteen proudly extend educational access and educational opportunity to a wide range of students

Statistical Portrait of the 1890s

- ✓ Total student enrollment of ~101,000, 70% of which is African American
- ✓ 7,308 of their undergraduates and graduates major in the food and agricultural sciences
- ✓ 51.6% of all degrees awarded to African Americans in Agriculture are from the 1890s (*J. of Black Issues in Higher Ed. 2008)*
- ✓ On average, 1890s graduate ~16,000 students per year


“We assume greater responsibility for economic development in the environment in which our institutions function - in terms of poverty, unemployment, youth-at-risk, illiteracy, and the absence of economic opportunities”



Unique and Diverse Programs

- One size does not fit all when describing the 1890s and all have unique strengths

- The campuses offer a variety of undergraduate, masters, doctoral and professional degrees



NIFA has reminded us all that in addressing critical issues facing the long – term viability of agriculture, we must :

establish larger, longer lasting programs to create substantial impacts

become more multi-institutional and multidisciplinary

Accordingly, as 1890s

we aim to expand and strengthen alliances and partnerships,

we seek to develop meaningful, mutually beneficial collaborations with 1862s, 1994s, and with each other

Therefore,

the rest of this presentation is sharing information about the 1890s as a first step in helping us building new partnerships, with you and among ourselves.


University of Arkansas
at Pine Bluff
Enrollment: 3,396

UAPB Land Grant Program Facility

University of Arkansas Pine Bluff

Research Strengths

- Establishing micropropagation of pecans for large scale multiplication
- Studying capabilities of the A*rabidopsis* genome for detoxification of heavy metals and mycotoxins
- Evaluating rice plants engineered to express isoflavone synthase (for health benefits)


Fort Valley State University (GA)
Enrollment: 3,594
FOUNDERS HALL

Fort Valley State University
Research Building

Fort Valley State University

Research Strengths

- Georgia Small Ruminant Research and Extension Center (GSRREC)
- Southern Consortium for Small Ruminant Parasite Control (SCSRPC), an international research group from 20 institutions
- Identifying medicinal plants through phytochemical screening and screening plants for rapid biomass production


Lincoln University (MO)
Enrollment: 3,314

Cooperative Extension Building – Lincoln University, MO

Lincoln University

Research Strengths

- Environmental Stewardship – remediation of heavy metals in soils and air quality studies related to greenhouse gas fluxes in various ecosystems

- Aquaculture – developing genetic techniques to allow bluegill production to be commercially viable

- Small ruminant production – antihelmintic effects of herbal mixtures


Southern University and A&M College (LA)
Enrollment: 13,185

Southern University's Agriculture Research and Extension Center

Southern University

Research Strengths

- Nanotechnology application in forest health management
- Assessing plant biobased utilization in restoration of urban ecosystem
- Studying value-added, nutritionally functional crops that could have nutraceutical value
- Investigating the economic efficiency of rearing cattle and goats together

North Carolina A&T State University
Enrollment: 10,614

Agricultural Land Grant Program Facility at NC A&T

North Carolina A&T State University

Research Strengths

- Hydrothermal treatment and biological conversion of biomass for biofuels production (i.e. animal wastes and aquatic plants)
- Improving intestinal integrity to enhance food safety and health in poultry without drugs or medication
- Developing a new technology that could ensure food-grade probiotic enzymes to be used in dairy products
- Economic assessment of changes in trade arrangements, bioterrorism threats and renewable fuels requirements on the US grain and oilseed sector

University of Maryland Eastern Shore – Enrollment: 4,434

Human Ecology and Cooperative Extension Facilities ---------->

<------Food Science Building

University of Maryland Eastern Shore

Research Strengths

- Sustainable Agriculture for managing soil and water contamination (P, N, and heavy metals) from poultry farms
- Molecular characterization and predictive modeling of *Salmonella spp.* from processed poultry; and prevalence, growth, survival and control of *Listeria* in blue crabs
- Utilization of seaweeds as functional foods
- Studying millets, sudangrass and switchgrass for conversion to biofuel


Kentucky State University
Enrollment: 2,834

KSU Land Grant Program Facility

Center for Sustainability of Farms and Families

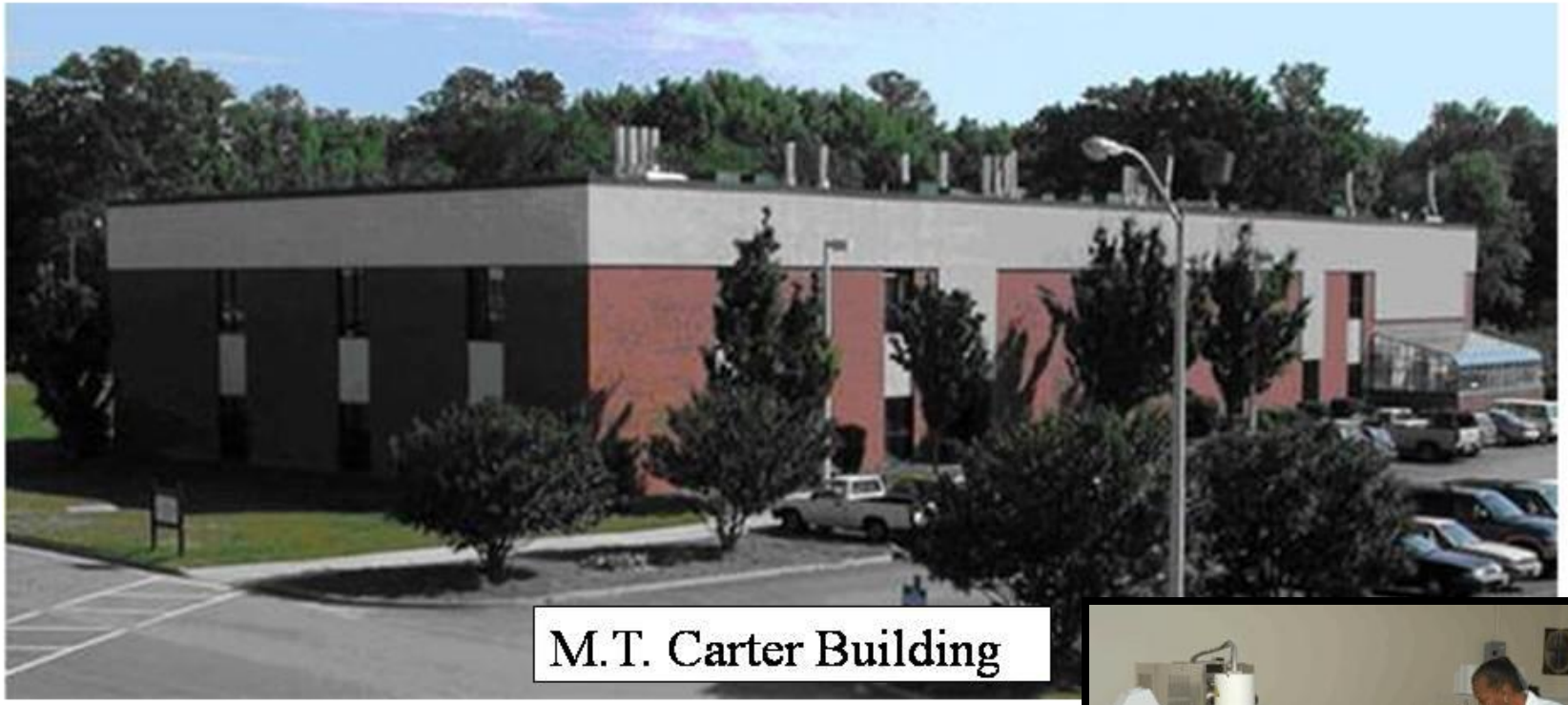
Kentucky State University

Research Strengths

- Integration of freshwater prawn nursery and growout systems into diversified farm systems
- Development of pawpaw and primocane fruiting blackberries as niche crops in Kentucky and SE US
- Evaluation of three stocking rates, and alternative forages for meat goat production in Kentucky

Virginia State University Enrollment: 5,366

Virginia State University Land Grant Research Facility



M.T. Carter Building

Virginia State University

Research Strengths

- Developing biologically-based strategies for insect pest management
- Diversifying cropping systems to enhance agricultural profitability
- Preventing the transfer of food-borne pathogens to specialty foods
- Developing sustainable small ruminant production systems


West Virginia State University
Enrollment: 3,502

West Virginia State University Land Grant Program Administration Building

West Virginia State University

Research Strengths

- Utilizing anaerobic digestion for converting agricultural residues and other waste biomass into bioenergy
- Applying microbial ecology and genomics methods to understand how microorganisms mediate environmentally important processes, such as carbon cycling
- Developing DNA markers and genetic mapping techniques for quality and yield improvement in vegetables

Alcorn State University (MS)
Enrollment: 3,200

Alcorn State University

State Metrology Facility

Extension & Research Complex

Ecology & Natural Resources Facility

Biotechnology Facility

Alcorn State University

Research Strengths

- Environmental intervention on childhood obesity of preschoolers
- Nanostructured materials synthesis chemical sensor development
- Development of specialty sweetpotato


Delaware State University
Enrollment: 3,600


Herbarium at DSU

Delaware State University

Research Strengths

- Center for Integrated Biological and Environmental Research
- The Center is home to the DSU Plant Molecular Genetics and Genomics Research Program
- Main focus of collaboration aims to better understand the mechanisms of disease resistance in beans and so contribute to the production of disease resistant varieties (funded by NSF)


Tennessee State University
Enrollment: 8,824

Research and Extension Facility at TSU

Tennessee State University

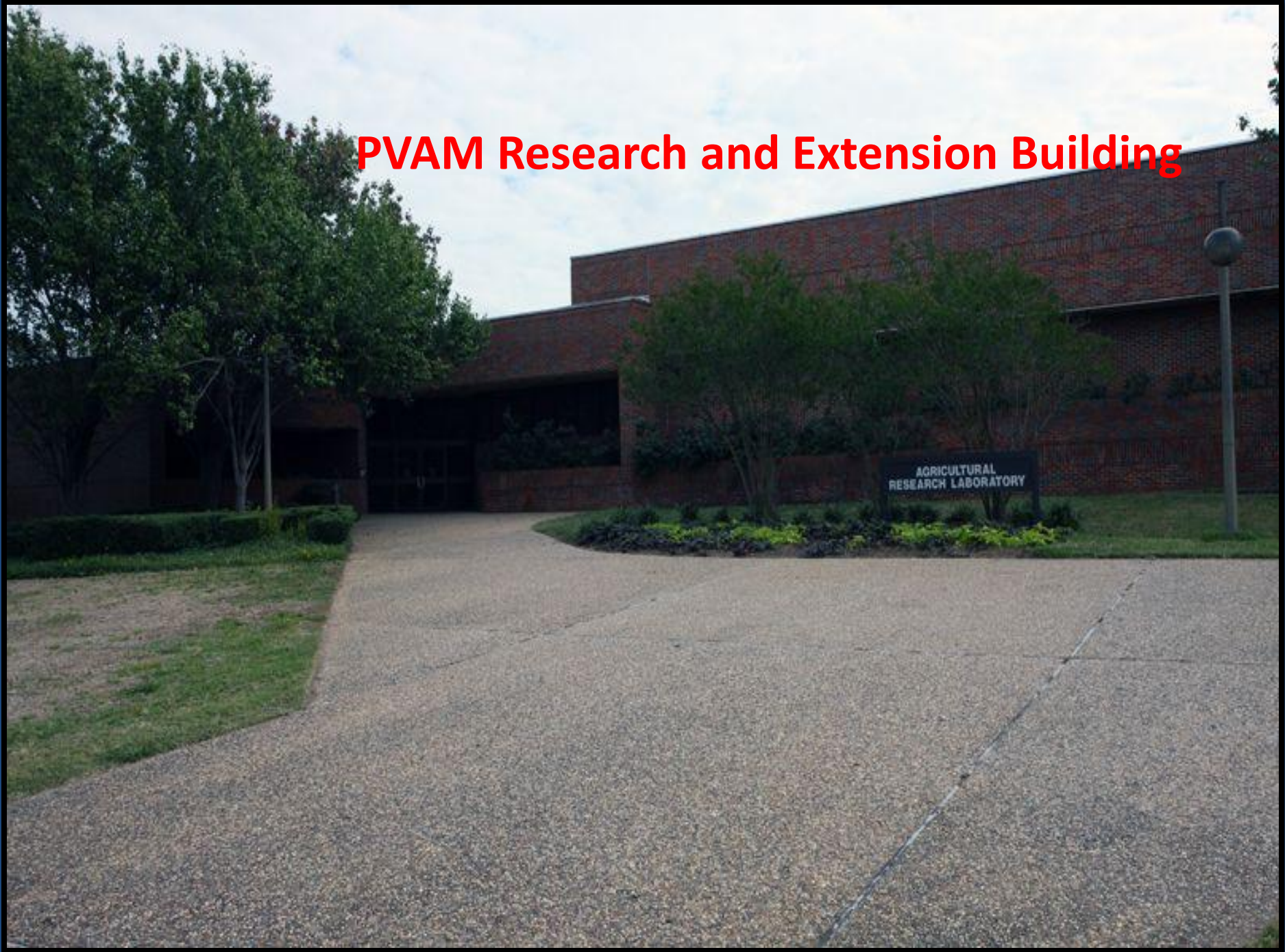
Research Strengths

- Nursery: Otis L. Floyd Nursery Research Center is dedicated to the improvement of the Tennessee nursery crop industry (pathology, entomology, genetics, horticulture)

- Animal Science: Goat breeding to improve health, reproduction, growth, carcass traits, and anti-microbial resistance

- Production of leaner and more profitable poultry through the identification of genes that are associated with excessive fat deposition

Prairie View A&M University
Enrollment: 8,187

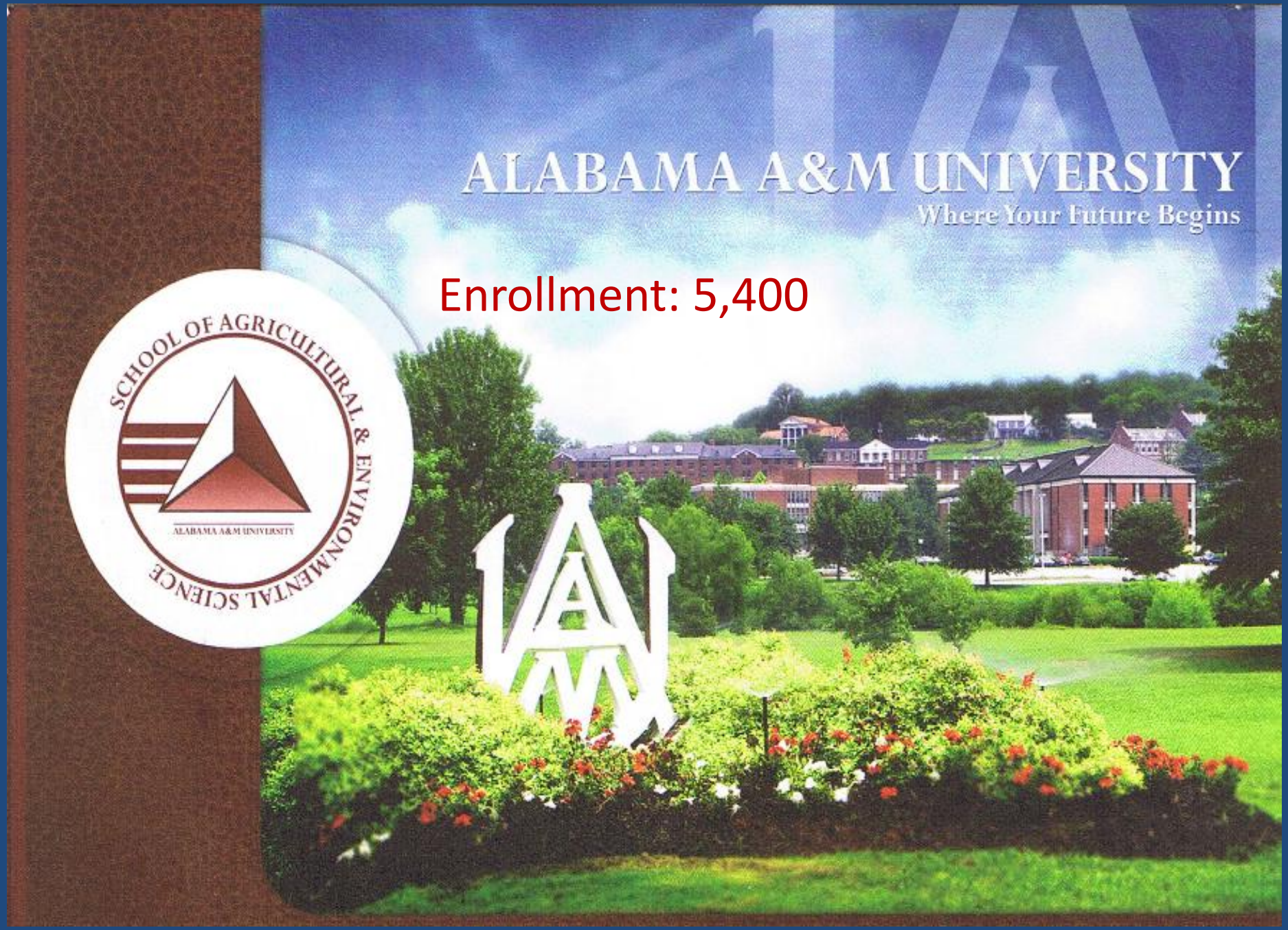

PVAM Research and Extension Building
AGRICULTURAL
RESEARCH LABORATORY

Prairie View A&M University

Research Strengths

- Biocontrol of animal and plant invader species in pasture and cropping systems of the Texas Gulf Coast Prairie

- Ecological systems approaches to cropping and pasture enterprises in Southeast Central Texas


ALABAMA A&M UNIVERSITY
Where Your Future Begins
Enrollment: 5,400
SCHOOL OF AGRICULTURAL & ENVIRONMENTAL SCIENCE
ALABAMA A&M UNIVERSITY

Alabama A&M University's Agribition Center

Alabama A&M University

Research Strengths

- Plant tissue culture and genetic transformation, genetic engineering, molecular biology and immunology program
- Biotic and abiotic controls on soil microbial enzyme production, turnover, and in-situ activities
- Evaluation of alternative feedstock for sustainable biofuel production in an agro-forestry system
- Biological weed and disease management and soil health for sustainable vegetable production


Langston University (OK)
Enrollment: 2,982

Langston University Agriculture Research Building

Langston University

Research Strengths

- Small ruminants

  Langston's American Institute for Goat Research (AIGR) focuses on: Angora, meat and cashmere goats, nutrition studies on high-producing dairy goats, value-added products from goat products

- Aquaculture Program

  Research and extension work on phytoplankton has provided information and techniques to fish producers to help them reduce the incidences of off-flavors in their catfish and hence increase the market value

South Carolina State University

Enrollment: ~5,000

South Carolina State University Extension Facility

South Carolina State University

Research Strengths

- Obesity Prevention Programs

SCSU is collaborating in a multidisciplinary, multistate program to investigate the causes of obesity among youth in "An Integrated Approach to Prevention of Obesity in High Risk Families." SCSU is focusing on obesity issues among children in South Carolina, particularly from African-American families.

This investigation also aims at identifying the crucial behaviors practiced among the resilient low income families in the same obesogenic environments

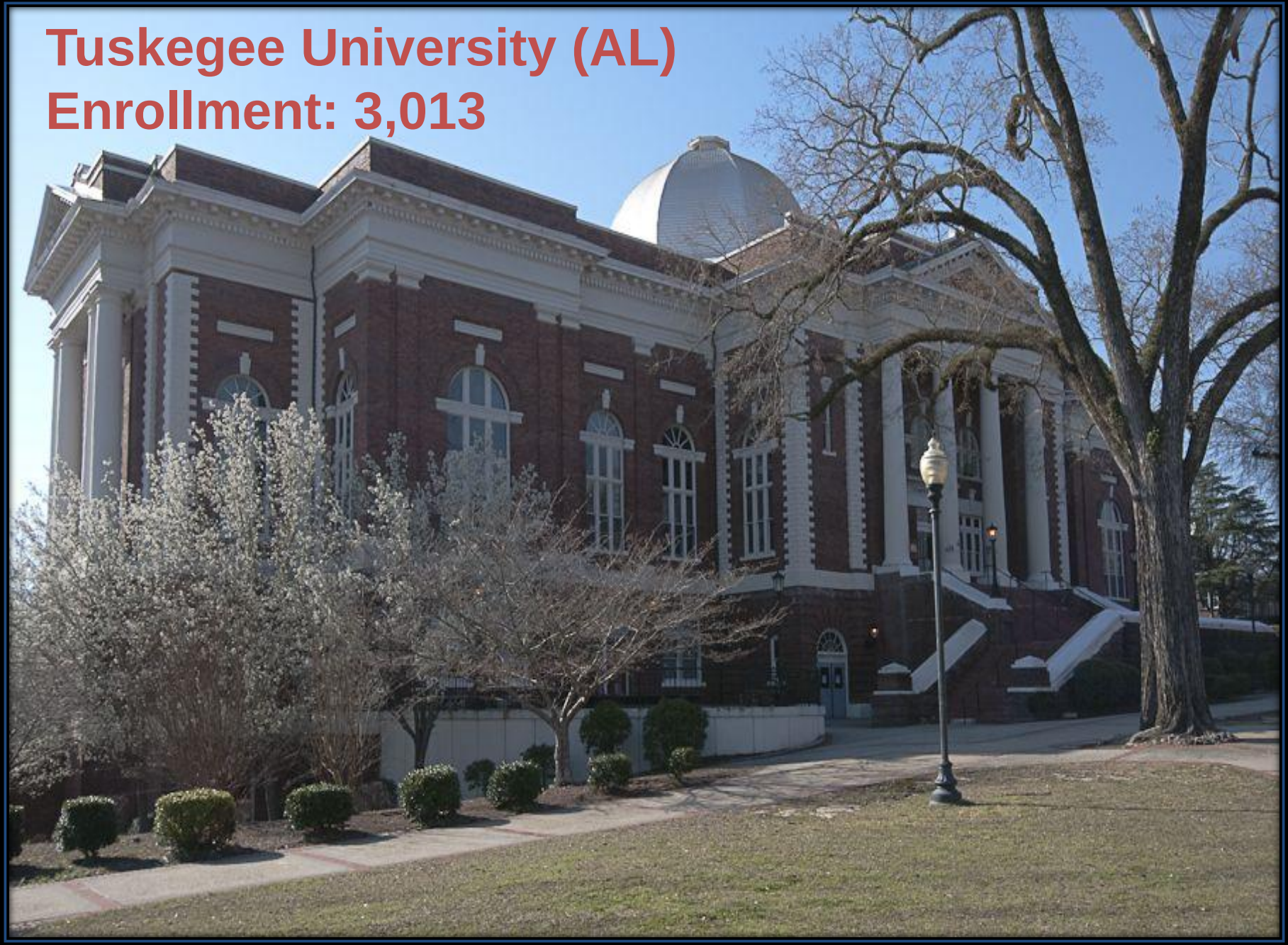

Florida A&M University
Enrollment: ~13,065


Perry Paige Building – Ag Sciences,
Engineering and Technology

Florida A&M University

Research Strengths

- Viticulture and small fruit research related to Florida grapes and small fruits
- Biological control research for developing ecologically based solutions to pest problems affecting agriculture, natural resources, and human health
- Bio-Energy research to uncover renewable and more sustainable forms of energy and bio-fuels; educate young bioengineers; and aid limited-resource farmers


Tuskegee University (AL)
Enrollment: 3,013

The Kellogg Conference Center

Tuskegee University

Research Strengths

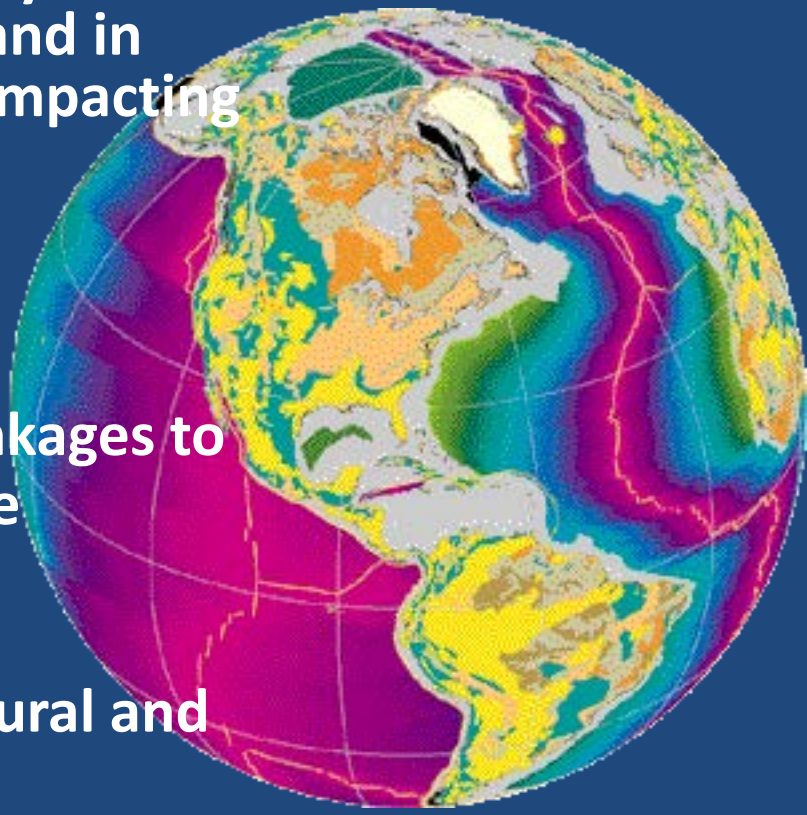
- Developing marker genes for sweetpotato, peanut, cocoyam, yam and Frafra potato
- Developing edible vaccines (sweetpotato and peanut): *Cholera enterotoxin* epitope gene, rabies glycoprotein genes
- Developing nutritious, disease resistant and environmentally adaptable high yielding crop plants
- Developed crop growing systems for NASA space application

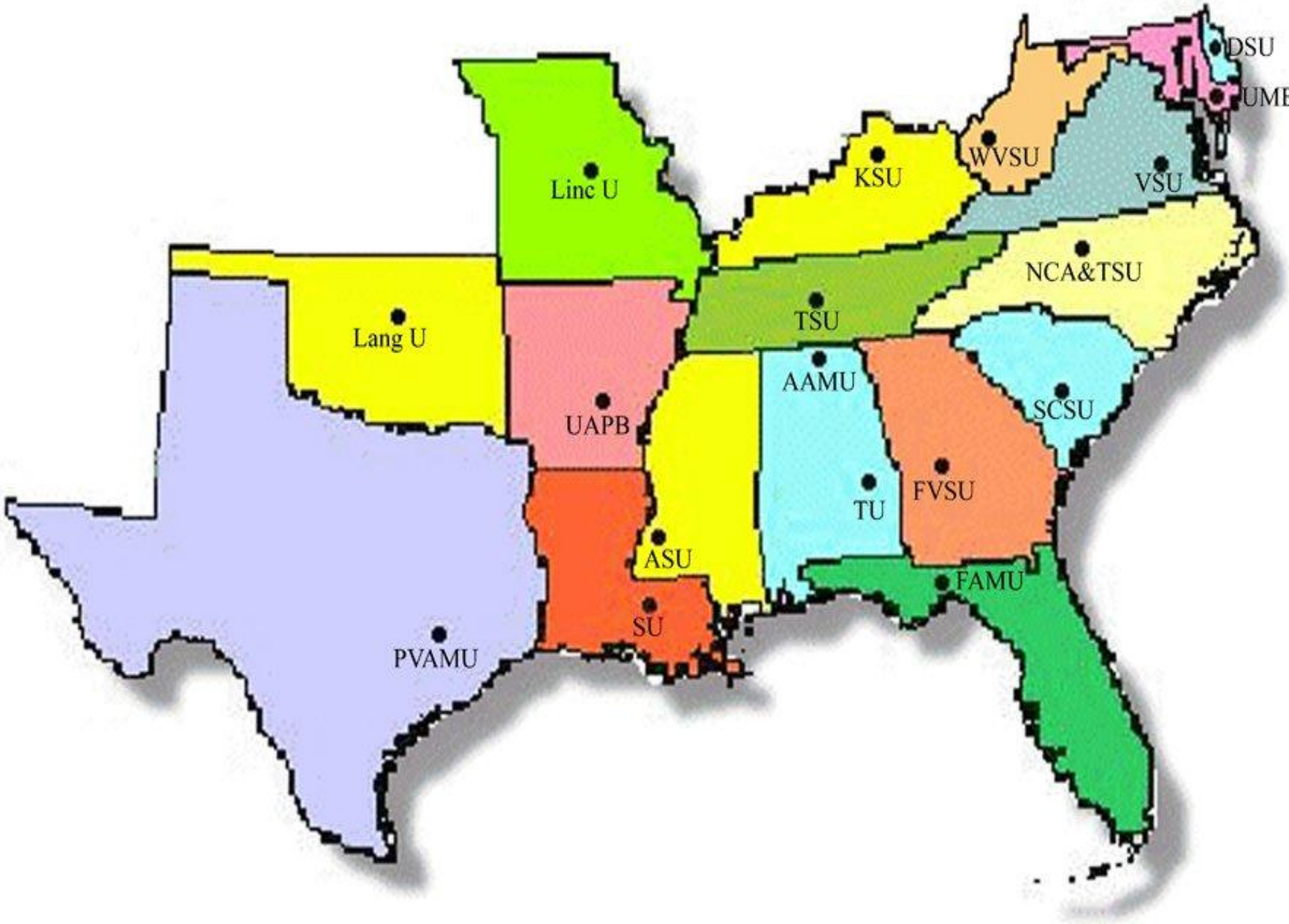
As 1890s we:

Are constantly aware of our primary responsibility to develop society-ready graduates who are uniquely trained and in demand to tackle the diverse issues impacting the global community;

and we look forward to:

Building national and international linkages to contribute our unique strengths to the development of global food security, environmental sustainability and competitiveness of U.S. food, agricultural and natural resource-based businesses.




DSU
UME
WVSU
KSU
VSU
Linc U
NCA&TSU
TSU
Lang U
AAMU
SCSU
UAPB
FVSU
TU
ASU
FAMU
SU
PVAMU

North Carolina A&T's Center of Excellence in Post-Harvest Technologies: An Equitable 1890-1862 Partnership

Alton Thompson, Ph.D.
Provost and Vice President for Academic Affairs
Delaware State University

2010 ESS/SAES/ARD Meeting & Workshop
Nashville, TN

Facilities

Perspective View

Core Laboratory

Plants for Human Health Building/N.C. State

Perspective of Central Campus

Nutrition Research Building/NC A&T

Core Laboratory

Core Laboratory Building

Castle & Cooke

North Carolina Research Campus
Kannapolis, North Carolina

NarmourWrightCreed

Core Lab - Construction Facts

- ~ 250 lbs. of marble
- > 1.5 million bricks
- > 450 feet long, or the size of 1 ½ football fields
- ~ 300,000 sq. ft., or almost 60,000 sq. ft. per floor
- Materials used from four of earth's continents and from 16 different countries: USA, Canada, Brazil, Argentina, France, Germany, Switzerland, Mexico, China, Japan, Thailand, Ireland, India, Turkey, Sweden and Finland

Highlight of the Equipment

- The Bruker 950-megahertz nuclear magnetic resonance spectrometer—the world's most powerful superconducting magnet.
- The two-story, 8-ton machine will significantly enhance key areas of research, such as drug development and nutrition.
- The NMR will allow scientists to deduce the structure of larger and more complex molecules, leading to many discoveries of new therapies or to uncover how certain vitamins cause changes in cells.

North Carolina Research Campus

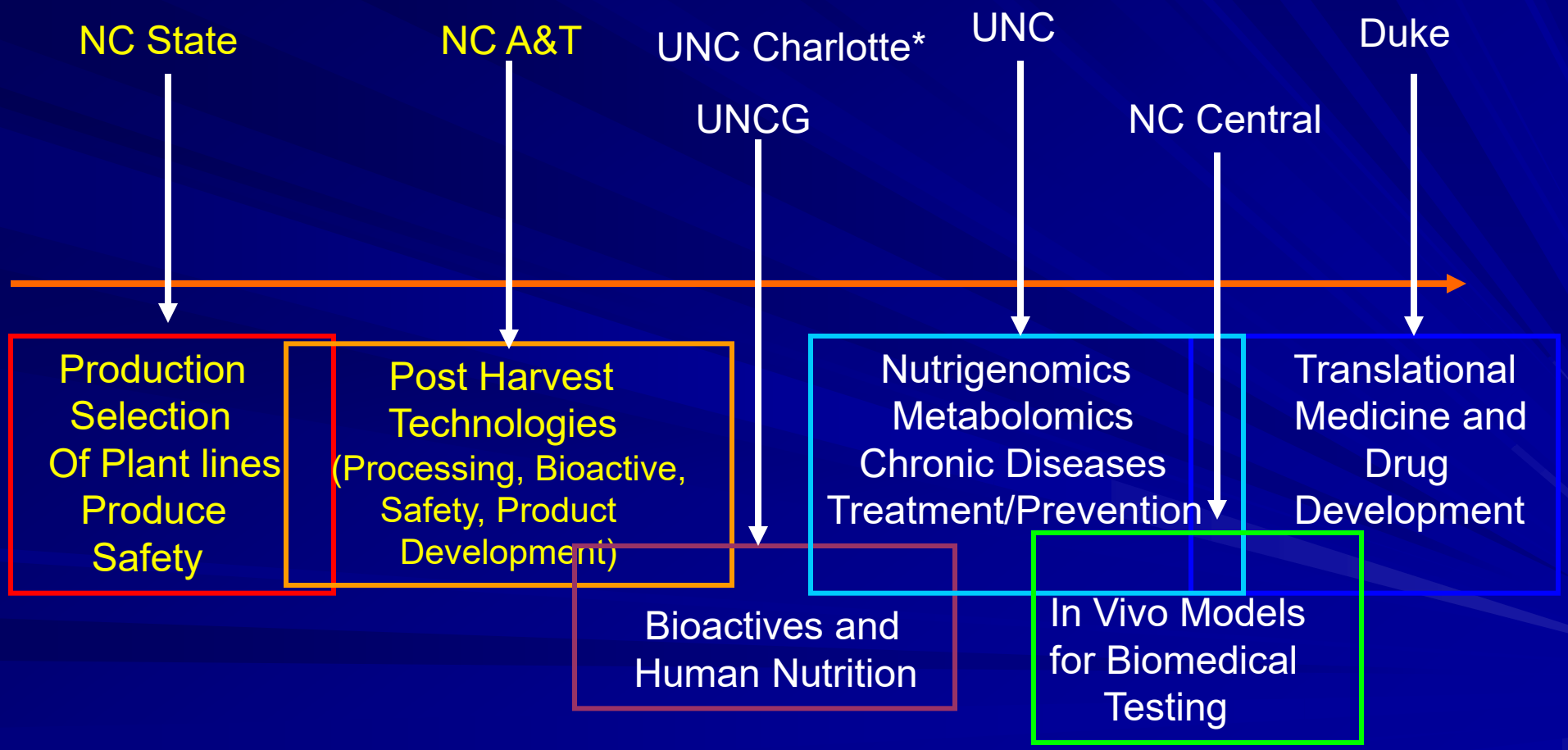
- A private-public venture created to foster collaboration and further advances in the fields of biotechnology, agriculture, nutrition and health
- More than a million square feet of state-of-the-art laboratory and office space
- Billionaire David Murdock ($1.5 billion)
- Cannon Mills → Fieldcrest→ Pillowtex

The Vision

- Create a world-class research hub where collaborative science will lead the charge for great discoveries in nutrition, health and biotechnology research.
- Become the world's epicenter of nutrition and disease research
- "The N.C. Research Campus will be a thriving scientific community where the best minds will shape the way we understand nutrition and its relationship to disease."

–David H. Murdock, owner of Dole Foods Company, Inc.

Partners and Roles



*UNC Charlotte will be conducting Bioinformatics Research

How did this happen?

- A conversation
- A think tank
- A well thought-out and complementary proposal
- Equitable partnership
- Funding from the N.C. General Assembly

How can A&T benefit?

- Access to top research facilities
- Collaboration with leading scientific minds and universities
- Opportunities to develop, test, and refine new product ideas *(with access to top talent and facilities)*
- *Opportunities for Intellectual Property and spin-off companies*
- Expanded opportunities – students and faculty
- Strengthen our land-grant mission

SAES Strategic Plan
(Goals/Fall 2005)

- Improve minority and environmental health
- Ensure a nutritious, safe and secure food supply
- Advance biotechnology
- Ensure the viability of small scale agriculture
- Protect the environment and natural resources
- Expand resource base and maximize relationships

NCA&T Center Of Excellence in Postharvest Technologies

- Focus on Foods (Fruits and Vegetables) and Health
- Onsite Center faculty (Core faculty/SAES)
- Off-site Affiliate faculty
- Opportunities for Interdisciplinary Collaboration/synergy
  - Core Lab
  - Joint projects
  - Experiential learning/training
- Center Goal: to be self sustaining through extramural funding for high caliber research

Mission

- Develop new and improved post harvest technologies while creating synergistic collaborations with other partners at the NC Research Campus to enable breakthroughs in science that generate knowledge, create jobs, and improve the quality of life and economic status of citizens in NC, US, and globally.

- Post-harvest areas
  Processing and preservation, storage stability, safety and quality, nutritional composition, recovery and identification of bioactive compounds for health applications (functional foods), product development, consumer research, value-added processing, etc.

Research Enterprise

- **Health Promoting Food Components***
  - ✓ Isolation and characterization of bio-active compounds.
  - ✓ Development of functional foods and nutraceuticals
- **Food Safety Issues***
  - ✓ Rapid and reliable methods for monitoring pathogens in produce
  - ✓ Safe minimal processing to inactivate food-borne pathogens and eliminate other food contaminants
- **Storage stability related to shelf-life and quality**
  - ✓ New technologies for predicting and extending the shelf-life and quality
  - ✓ Effect of storage and processing on nutrients and bioactive compounds
- **Value-added product development***
  - ✓ Development of new value-added food and non-food uses
  - ✓ Evaluation of products' quality and consumers acceptability

**Center projects in these areas were recently funded by the USDA (~$2.5 million)*

Outreach Enterprise

- Facilitate transfer of discoveries in the areas of post harvest technologies
- Actively seek science-based solutions to post-harvest issues facing growers, processors, distributors, and consumers of agricultural commodities (with focus on fruits and vegetables)
- Build mutually beneficial partnerships with the industry
- **Examples of outreach activities**
  - ✓ Seminars, short courses, audiovisual and print materials
  - ✓ Consultancy, technical assistance, and contract research
  - ✓ Analytical and diagnostic services

Experiential Learning/Training

- Experiential learning and training of students/young scientists on cutting-edge science and technologies for enhanced competitiveness in the job market
- Hands-on experiences in pertinent aspects of post harvest technologies
- Multidisciplinary training opportunities through shared resources and synergies with other NCRC partners

Academic Enterprise

- Request authorization to plan and establish a doctoral program in Food and Bioprocess Technologies
- USDA Capacity-Building Grant to Plan and Establish

Questions/Interest

- Contact:

  e-mail: Mohammed Ahmedna - ahmedna@ncat.edu

  Leonard Williams - llw@ncat.edu

  Phone: (704) 250-5704

- Visit:
  - NCA&T/SAES Link

    http://www.ag.ncat.edu

  - NC Research Campus:

    http://www.ncresearchcampus.net/

Mutually Beneficial Partnerships

Walter A. Hill
Tuskegee University

September 28, 2010

Why mutually beneficial partnerships?

 Religion/Philosophy – e.g. Golden rule

$$ Money/Resources/Power

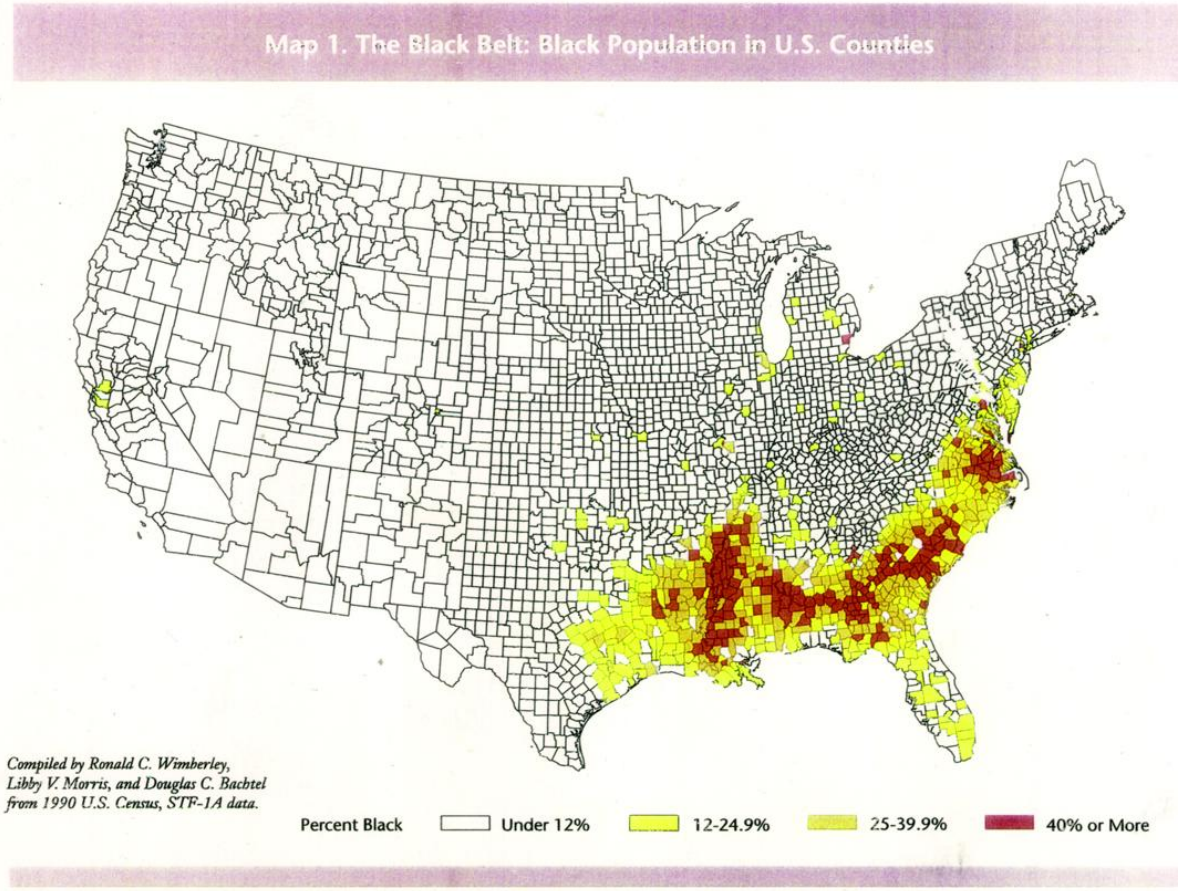
 Service to Society

 Foster Positive Change/Achieve specific goals - simple vs. complex problems

 Support/Feedback/Health Benefits– Less anxiety/ less stressful

Southern Food Systems Education Consortium (SOFSEC): A Successful Partnership Model

SOFSEC Universities
Alabama A & M
Alcorn State
Florida A & M
Fort Valley State
North Carolina A & T
Southern U. & A & M College
South Carolina State
Tuskegee
U. Arkansas at Pine Bluff



1993→ 2003
Six→Nine Members
WKKF→Self Sustaining

Institutional Change & Capacity Building — K-12-University Partnerships
Sustainable Food & Agricultural Systems — Community & Economic Development

Lessons Learned/Values

- ✓Share Credit and Resources
- ✓Negotiation/Diplomacy/Communication – talk it through
- ✓Boldness and Courage – A real requirement
- ✓Do It For Others – Not self interest driven only
- ✓Highly Value the Community Base
- ✓Persistence/Staying Power
- ✓Build Trust – Give (You Will Receive)
- ✓Prayer Works

AALGA

Alabama Agricultural Land Grant Alliance (AALGA)
Alabama A & M University, Auburn University, Tuskegee University

Principles

SHARE
- leadership
- work - specialties/niches
- responsibilities
- resources
- credit

- Leverage Strengths
- Minimize duplication
- Communicate with stakeholders
- Communicate with each other
- Optimum service to the public

AALGA

Alabama Agricultural Land Grant Alliance (AALGA)
Alabama A & M University, Auburn University, Tuskegee University

- Shared Commitment (MOU signed by Presidents and Deans of Agriculture)
- Funded By the State Legislature as a separate line Item
- Supported by Commodity and Agriculture Groups
- Supported by the Black Caucus
- Supported by House and Senate Leadership
- Supported by the Citizens of Alabama - Voted Yes (State-Wide) for AALGA facilities)

AALGA

- Matching Funds for 1890s Fully Met
- Administration – Deans Committee, Rotating Chair, Executive Secretary
- Faculty Task Groups Are Funded
- Lessened long-term tensions between 1890s and 1862s
- Not Court Mandated –Volunteered
- Funds Go directly To Each University via Alabama Commission on Higher Education

AALGA

Joint Newsletter

The Alabama Agricultural Land Grant Alliance

The AALGA REPORT

Alabama A&M University – Auburn University – Tuskegee University — Issue #1, October 2002

Introducing AALGA

New directions for Alabama agriculture

The Alabama Agricultural Land Grant Alliance is rooted in a shared commitment on the part of agricultural researchers and administrators at Alabama A&M University, Auburn University, and Tuskegee University to find new and better ways to respond to the needs of the people of Alabama and the agriculture that is a large part of our state's economy. While some joint research projects were already being carried out, it was felt that a more formal alliance could facilitate more effective joint efforts, focusing multi-facility expertise and resources on identifying and prioritizing responding to the most critical needs of Alabama. This AALGA was formed in June, 2000 through a memorandum of understanding.

The role of AALGA is to facilitate cooperation among the research faculty at the three universities. More than a shared working commitment than an institution, AALGA functions through the university deans and research directors working in a committee, and through working faculty task groups. With modest funding through the Alabama legislature, AALGA is able to provide seed money to help innovative research projects get started. (See mission statement, page 6.)

In its first two years, AALGA facilitated two statewide projects. A conference on increasing access to rural areas raised awareness of the need and pointed out conditions necessary to achieve "equal access" for all Alabamians. This project is now being carried out by a separate inter-institutional organization, the Alabama Connectivity Forum. A symposium on the concepts and practice of sustainable agriculture was held in early 2002 (reported inside, page 2). Currently, faculty task groups are tackling critical agriculture-related problems that affect both rural and urban areas. The major issues being addressed are water quality, waste management, small farms and community-based agriculture, and food quality and safety.

Task groups are tackling critical agriculture-related problems

Water Quality

Alabama is a comparatively water-rich state, and plentiful fresh, clean water is essential not only for agriculture and rural people but for urban dwellers, industry, and tourism. The AALGA water quality task group is focusing on developing better ways of assessing and maintaining water quality, especially in regard to possible agricultural impacts. Members of this group include Dr. Claude E. Boyd, Auburn University; Dr. Govind C. Sharma and Dr. Tebikie Tsegaye, Alabama A&M University; and Dr. Ramble Awasthi, Tuskegee University.

Waste Management

Improperly handled animal wastes can be a threat to water quality as well as nuisance to neighbors. The AALGA waste management group is working to develop better waste handling methods and explore new ways to convert wastes into useful economic products. This group includes Dr. James S. Bannon, Dr. Wes Wood, Dr. Oladiran Fasina and Mr. Jud Boyd of Auburn University; Dr. Zachary Senwo and Mr. Dexter Watts of Alabama A&M Uni-

See new Directors, p. 3

Macon County farmer Mary Morris raises cotton with corn, sells corn to a poultry integrator, and uses poultry litter as fertilizer. His system keeps input costs down, conserves soil and water, and helps him get sustainable, higher returns (see story, p. 4).

Dr. McArthur Floyd Research Director, Winfred Thomas Agricultural Research Station, Alabama A&M University and Associate Director, the Alabama Agricultural Experiment System

Dr. John Jensen Interim Dean and Director, College of Agriculture and the Alabama Agricultural Experiment Station, Auburn University

Dr. Walter Hill Dean and Director, College of Agricultural, Environmental and Natural Sciences and the George Washington Carver Agricultural Experiment Station, Tuskegee University

The Alabama Agricultural Land Grant Alliance

The AALGA REPORT

Alabama A&M University – Auburn University – Tuskegee University — Issue #12, September 2005

Invasive species, new crops, bioenergy, rural development, and more

New AALGA Research Projects Focus on Important Alabama Needs

Nine new research projects addressing a variety of needs identified as important for Alabama's rural and urban citizens were announced after a meeting of the AALGA executive committee in Montgomery on August 18th. All projects employ the combined expertise of scientists from all three of Alabama's land-grant universities. Issues being addressed: ***coping with invasive plants, development of a medicinal plants industry in the Black Belt, biofuels development, value-added catfish products, diversified agro-forestry enterprises, improved safety and quality of small farm food products, development of infrastructure for water-harvest based irrigation research, and improving food safety in rabbit meat processing.***

Competition among faculty of the three Universities was intense, as 31 proposals for AALGA-facilitated research projects were received. AALGA provides relatively modest seed grants that allow faculty to undertake research of special relevance to Alabama that might not otherwise find funding. Faculty teams are also expected to establish a knowledge base enabling them to attract additional funding from Federal or non-governmental sources with which to further advance their research.

In addition to the nine new research projects, three previously funded projects were authorized to continue through the coming year. Ongoing projects include research on developing innovative wastewater treatments in the Black Belt area, determining nutrient requirements and nutritional values of Alabama-grown fruits and vegetables (see "Research Aims at Consumer and Farmer Benefits," page 5), and determining how interplay of natural, cultural, social, political, infrastructural and financial factors contribute to successful community development in rural Alabama.

New projects announced are:

• Developing Strategies and Tools for Control of Cogongrass

Cogongrass has become one of Alabama's most troublesome invasive plants. To be successful, cogongrass control measures must be based on knowledge of its biological characteristics and growth habits. This research will provide the important scientific knowledge needed, focusing especially on soil fertility requirements and the relative importance of seeds and roots in spread of cogongrass.

Continued on page 2

Ag Energy News

It's too early to know exactly how much the new Federal Energy Bill will stimulate bioenergy development or help farmers in Alabama, but interest is certainly growing rapidly. A new biodiesel plant at Moundville in Hale County is expected to be producing Alabama biodiesel soon, helped by a grant from the Alabama Department of Agriculture & Industries. Mark Hall, regional Extension agent in Madison County reports having met with oil distributors interested in biodiesel in both north and south Alabama, and a group of Alabama and Tennessee farmers and others are looking into building an ethanol plant in the Decatur area.

ADECA will be announcing a new round of ag energy demonstration grants shortly, and is planning a 2nd annual ag energy conference in Auburn November 9. For information, contact Kathy Hornsby at: KathyH@ADECA.state.al.us.

One Energy Bill item not getting as much publicity as biofuels but could help farm families save on long-term electric power costs is a 30% tax credit for homes or businesses installing solar electric or solar hot water or heating systems.

Farm Bill Forum Held at Tuskegee

After welcoming remarks by Tuskegee University President Benjamin F. Payton, USDA chief Mike Johanns (in dark in blue shirt) held a three-hour 2007 Farm Bill listening session at Tuskegee University's Kellogg Center. Over 500 farmers and others attended, and some 50-60 offered comments on USDA programs. Congressman Artur Davis (on dais at left) attended and spoke briefly on the need to support farm families and eradicate poverty in the region. Congressman Mike Rogers (right) also attended part of the session.

See story, starting on back page.

The Alabama Agricultural Land Grant Alliance

The AALGA REPORT

Alabama A&M University – Auburn University – Tuskegee University — Issue #13, December 2005

Ag Energy News

Participants in the 2nd annual ADECA Ag Energy Conference in Auburn last November generally agreed that most forms of bio-mass energy are now competitive with fossil fuels; and several remarked that fossil fuel depletion rates are making it more urgent to find alternative and renewable energy sources.

Auburn University's Dr. David Bransby cited a recent DOE/USDA study concluding that the US could use biomass to meet more than one-third of the current demand for transportation fuels with only modest changes in land use and farming and forestry practices (see www.eere.energy.gov/biomass/pdfs/final_billionton_vision_report2.pdf.)

Other presentations included advances in energy efficiency in aquaculture and poultry production, row-crop energy savings through precision agriculture, and a review of biofuel initiatives in Alabama – including the news that Alabama now has a fully operating biodiesel facility, the Alabama Biodiesel Corporation plant in Moundville.

Conference presentations are available at the ADECA website: www.adeca.state.al.us/C0/Agriculture%20Energy%20Efficiency/default.aspx; or call Kathy Hornsby at 800-392-8098.

State school food policy calls for fresh Alabama produce

Farm to School – What's the Potential for Alabama Farmers?

Over 90 million lunches and about a third as many breakfasts – that's how many meals Alabama schoo serve to children during the school year. It's a lot of food, and makes up a large part of the total nutrition intake of our children. Making sure all these school meals are nutritionally sound and healthy is ve much in the public interest, especially since Alabama children and adults consistently rank at or near t top in nationwide obesity studies, and obesity can be a leading factor in development of heart diseas high blood pressure, stroke, diabetes, cancers, and gall bladder disease.

Fortunately, the nutritional quality of Alabama school meals should soon be greatly improved. new school food policy adopted by the state Board of Education last July calls for each school system develop a strategic plan for improving the nutritional quality of both cafeteria meals and vending m chine offerings by April 1, 2006. The policy statement not only requires that school meals conform USDA dietary guidelines for children and adults (for example limiting fats to less than 30% of calories but calls for steps such as "reducing the number of fried foods and pre-prepared items," and "increasir the whole grain options, having one percent or less fat milk as the standard beverage, and increasing fru and vegetables, preferably using freshly grown Alabama produce."

Just how serious the intent of the Board of Education is may be indicared by another stipulatio that "schools may not use CNP [Child Nutrition Program] funds to purchase new fryers for the scho breakfast/lunch programs." The policy is available on the state Department of Education website *www.alsde.edu/html/sections/documents.asp?section=53&footer=sections.*

Of particular interest to the agricultural community, of course is the suggestion of "preferably using freshly grown Alabama produce." Fulton Perry, child nutrition programs administrator at the Alabama Department of Education, confirms that the Department will do its best to help school kitchen managers and nutrition program directors offer more Alabama-grown produce, and points out

Continued on page 2

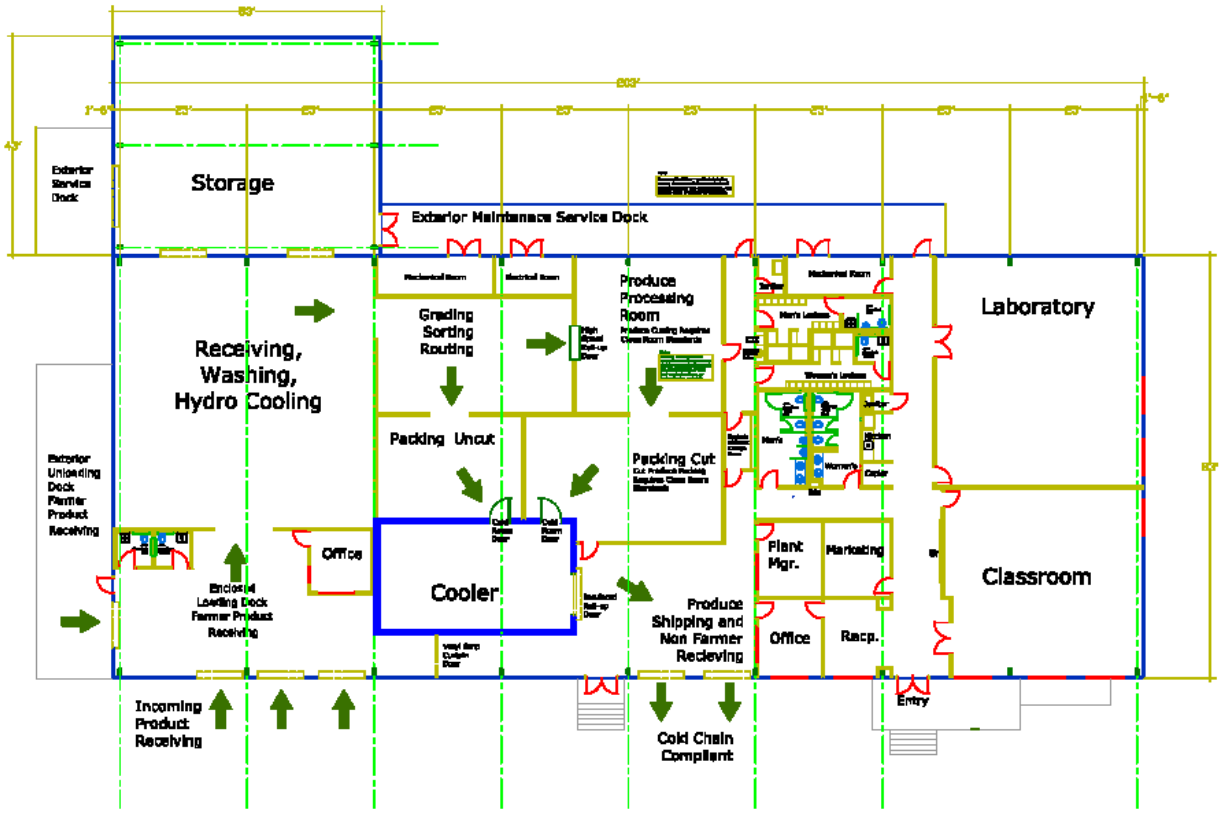
At Opelika's Northside School, kitchen manager Vanessa Edwards, center, took a break from supervising the serving line to pose with Bryan Robinson, age 11, and Shanequoyia Beaty, age 10, as they enjoy the school's annual Thanksgiving dinner, featuring fresh collard greens and sweet potatoes along with the usual turkey, mashed potatoes and gravy. Melanie Payne, Child Nutrition Program Director for Opelika schools, has been a leader in providing high quality, nutritious school menus consistently featuring fresh fruits and vegetables.

AALGA

- Budget has Grown Each year (11% FY10-11)
- Shared McIntyre-Stennis federal and state matching funds*
- Sustained through multiple leadership changes - (6 Deans/Directors - 9 Presidents)
- On-going vehicle for New Opportunities

AALGA

Alabama Governor's Black Belt Commission - Agriculture Committee



Black Belt Family Farm Fruit and Vegetable Market Center

Selma, Alabama

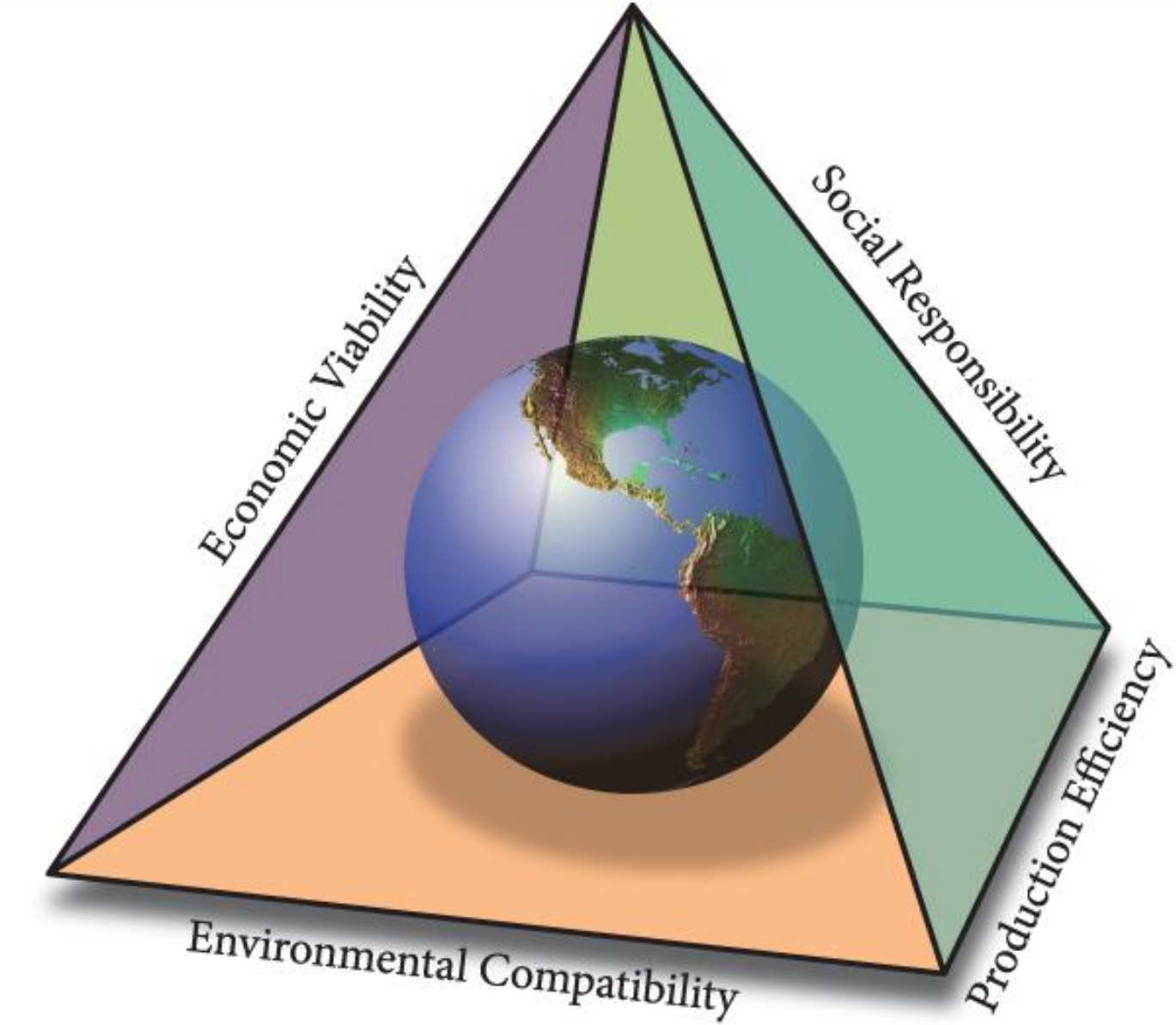
Agricultural Marketing Service
FEBRUARY, 2010
FIDEL DELGADO AIA
USDA

Grand Challenge I

Enhance the sustainability, competitiveness, and profitability of U.S. food and agricultural systems

Contributors:

Steven A Slack chair, Nancy Cox, Stefan Goetz, Casey Hoy, James Kinder, Josef Kokini, John Liu, Rick Melnicoe, Steve Meridith, Phillip Pardey,, Phillip Rasmussen, Kate Scow, Reagan Waskom, H Michael Harrington (ED)


Economic Viability
Social Responsibility
Environmental Compatibility
Production Efficiency

"Sustainability is more than a buzz word"

- Enhancing environmental quality and the natural resource base upon which the agricultural economy depends
- Enhancing efficient use of nonrenewable and on-farm resources and, where appropriate, integrating natural biological cycles and controls
- Sustaining the economic viability of farm operations and the entire agricultural industry
- Improving the quality of life for farmers, ranchers, and society as a whole
- Providing for adaptive management that can meet climatic changes or other megatrends

Research Needs and Priorities

- Water Resources – quality and quality
- Develop New Plant Products, Uses, and Crop Production Systems
- Develop New Animal Production Technologies, Practices, Products and Uses
- Improve the Economic Return to Agricultural Producers
- Improve the Productivity of Organic and Sustainable Agriculture
- Improve Agricultural Productivity by Sustainable Means, Considering Climate, Energy, Water and Land Use Challenges
- Maintain a Sustainable Environment

Expected Outcomes - 1

With investment in, and adaptation of, these new and universal approaches, agriculture will be subject to evaluation and assessment using the same sets of tools and metrics and the same vocabulary as that used to evaluate energy use, carbon footprints, fair trade, etc., in a variety of land uses.

Evaluating agriculture using a framework that places agricultural production, and ultimately stewardship, within this broader context will benefit farmers as well as consumers.

Expected Outcomes - 2

Without the investments in the research areas outlined above, agricultural systems that continue to have a narrow focus primarily on productivity will be highly vulnerable to increases in energy costs, loss of key fertilizer sources (e.g., phosphorus deposits), and climate variability.

Without development of data sets and holistic analytical tools with which to evaluate sustainability in agriculture, we will not be equipped to meet the enormous challenges anticipated in the near future.

Framing the Issue

- Daunting, a truly “grand” challenge!
- Caused by human activities (IPCC)
- Climate is changing rapidly

  + 3-6^0 F by 2050; 10^0 F by 2100 (usual business)

  100X faster then recent ice age transition
- Evidence
  - Warmer winters, earlier springs, heat extremes, weather events (variation)
  - Rising sea level, melting glaciers, arctic sea ice, loss of trees in Rocky Mts., etc
- Inertia of climate system

Framing the Issue

- A Different, A Grander Challenge -

- A global problem, requiring global cooperation
- Decision making under uncertainty
- A timescale challenge
  - Weather (daily/seasonal)
  - Climate (decades, centuries)
- Complexities - supply chains
  - Shifting production, distribution…
- Non-climate factors affecting agriculture and adaptive capacity

Impacts on Agriculture
- Examples -

- Increasing carbon dioxide
- Warmer and longer growing seasons
- Increased summer heat stress
- Warmer winters
- Increased frequency of heavy rainfall, summer drought, weather events
- Less water from snowmelt in Western US
  - Increased urban – ag tensions

- US agriculture will not continue “business as usual”

Current Capacity and Science Gaps

- We have depth and breadth across US but to build adaptive capacity for agriculture we need:
  - To address uncertainties in climate model projections
  - Better decision tools for strategic adaptation
  - Ag practices, technologies, policies to increase resilience

Current Capacity and Science Gaps

- We have depth and breadth across US but to build adaptive capacity for agriculture we need:
  - Engagement of social sciences – communication and rural sociology
  - A transdisciplinary systems approach for technological adaptation, policy design, communication, equity issues, risk perception
  - To improve mitigation efforts – accounting, monitoring, costs/benefits analysis

Research Needs

- Climate Science
  - Improved and downscaled models
    - Relevant at farm level
    - Addressing nitrogen, carbon and water changes
  - Improved real time predictive tools for pests, heat stress, extreme events
    - Accounting for increased variations in weather
- Economic assessments of climate change
  - Cost/benefits of adaptation and mitigation
    - Farm gate and food system
  - Equity and social justice

Research Needs

- Decision Science
  - Design decision support tools for producers and consumers
- Adaptive Strategies and Management
  - Determine where to invest research
    - Livestock – heat stress, new breeds
    - New, more tolerant crop varieties
    - Improved water management strategies
    - Rising sea level and infrastructure changes at port facilities

Research Needs

- Mitigation, carbon sequestration
  - BMPs to reduce greenhouse gas emissions
- Communication
  - Effective communication to all audiences
  - Evaluate framing of issues
  - Use of social media, social networking
- Policy
  - Effective policy development for mitigation and adaptation
    - Land use, soil and water conservation, insurance…

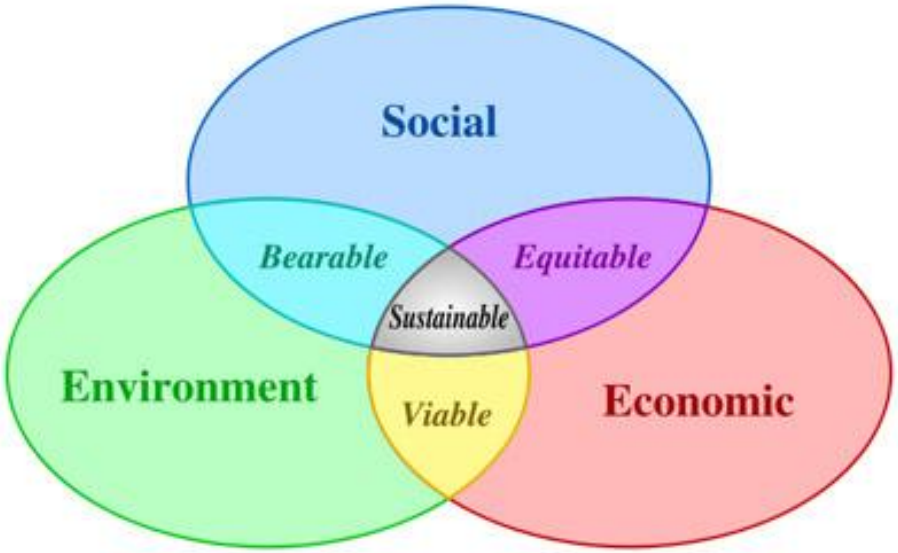
A grand challenge?

Or the greatest challenge ever?

Acknowledgements

- Science Leaders
  - Dave Wolfe, Cornell
  - Jim Jones, University of Florida
  - Art DeGaetano, Cornell
  - John Antle, Montana State University
- Ex Director
  - Arlen Leholm, North Central Region
- ESCOP Science and Tech
  - Mike Hoffmann, Cornell
  - F. Abel Ponce de Leon, Univ. Minn.
  - Joseph Kokini, Univ Ill.
- Peer Reviewers
  - Jerry Hatfield, ARS USDA
  - Ralph Cavalieri, Washington State

Energy Security and the Bioeconomy


Social
Bearable
Equitable
Sustainable
Environment
Viable
Economic


NO BIOMASS!
GREEN WASH

Efficient Use
of
Inputs

Production
and
Processing
Technology

Capacity there but reorientation

Soil Organic Matter	Carbon footprints
Algology	Biomass from algae
Agricultural power and mechanization	Energy input costs
More grain, less stalk	More cellulose, less grain
Grow food more efficently on our best land	Utilize marginal lands for energy
Increase the yield of commodity crops	Play catchup with new biomass species

Grand Challenge 4

We must play a global leadership role to ensure a safe, secure, and abundant food supply for the United States and the world.

Acknowledgments

Science Leaders

Glen C. Shinn (Texas A & M University), Team Leader
Jacque Fletcher (Oklahoma State University)
Francisco Diez-Gonzalez (University of Minnesota)
Susan F. Barefoot (Clemson University)
James G. Leising (University of Minnesota)

Executive Director

Carolyn Brooks (Association of 1890 Research Directors [ARD])

ESCOP Science and Technology Committee Members

John Liu (Auburn University)
Frank Zalom (University of California, Davis)

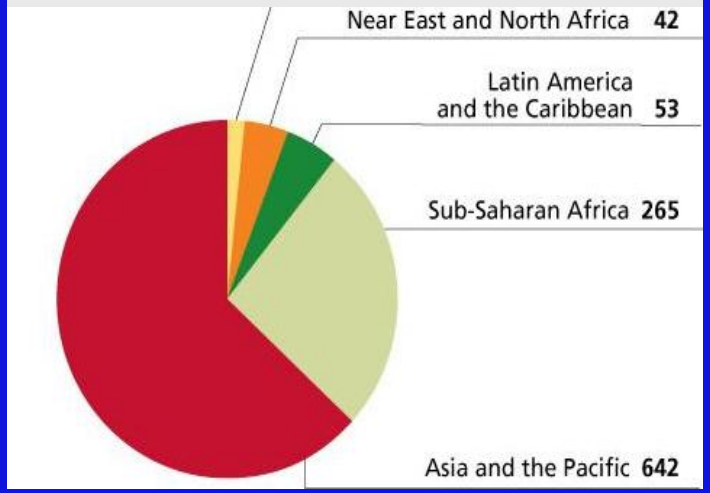
Peer Reviewers

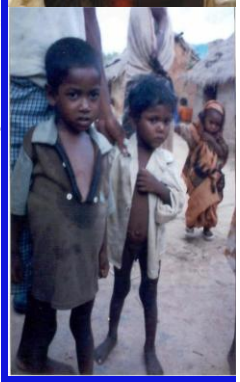
George R. Askew (Clemson University)
Vern Cardwell (University of Minnesota)
Mary Palm (USDA-Animal and Plant Health Inspection Service [APHIS])
Mary E. Palm-Hernandez (USDA-APHIS)
Travis Park (Cornell University)
Frank Busta (National Center for Food Protection and Defense)

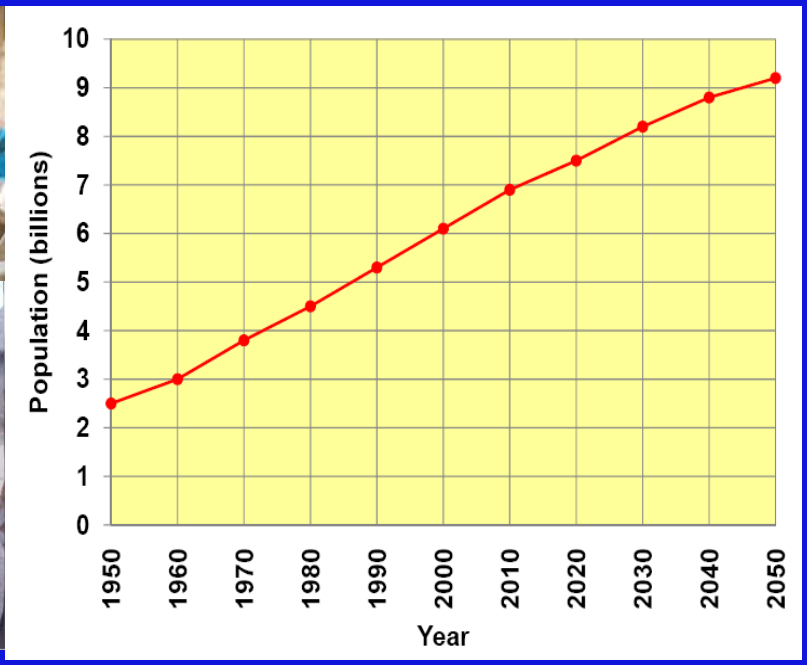
Food Security

Grand Challenges of Agriculture

1 in 6 people hungry = 1.02 billion







"In the next 50 years we are going to have to produce more food than we have in the last 10,000 years, and that is a daunting task."

---Norman Borlaug

Food Safety

Salmonella

E. coli O157:H7

Fungal toxins

Bird flu

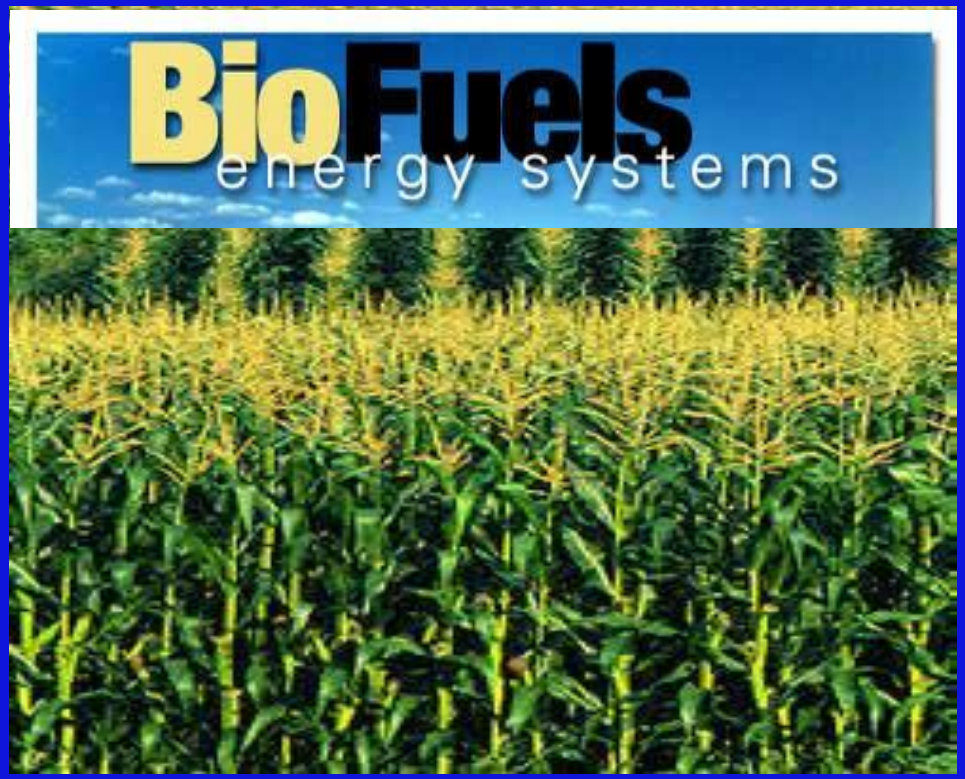
Bioterrorism

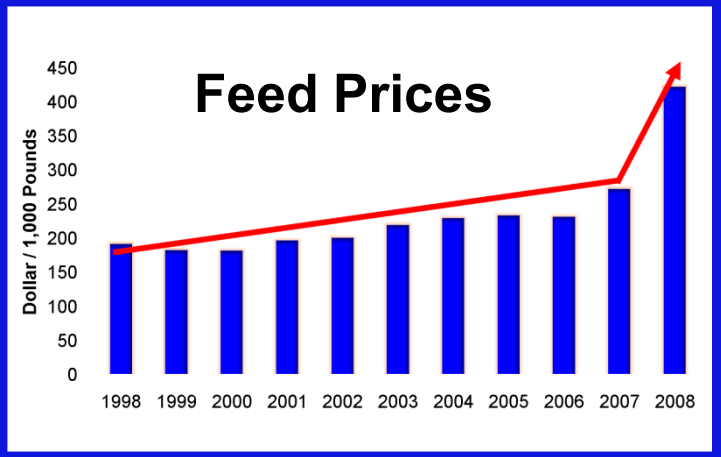
- 76 million annual illness in the US
- 5000 annual deaths in the US
- $152 billion annual economic loss in the US
- > 2 million people worldwide die from foodborne or waterborne diarrheal diseases annually

Environmental Degradation & Climate Change Threaten Food Security

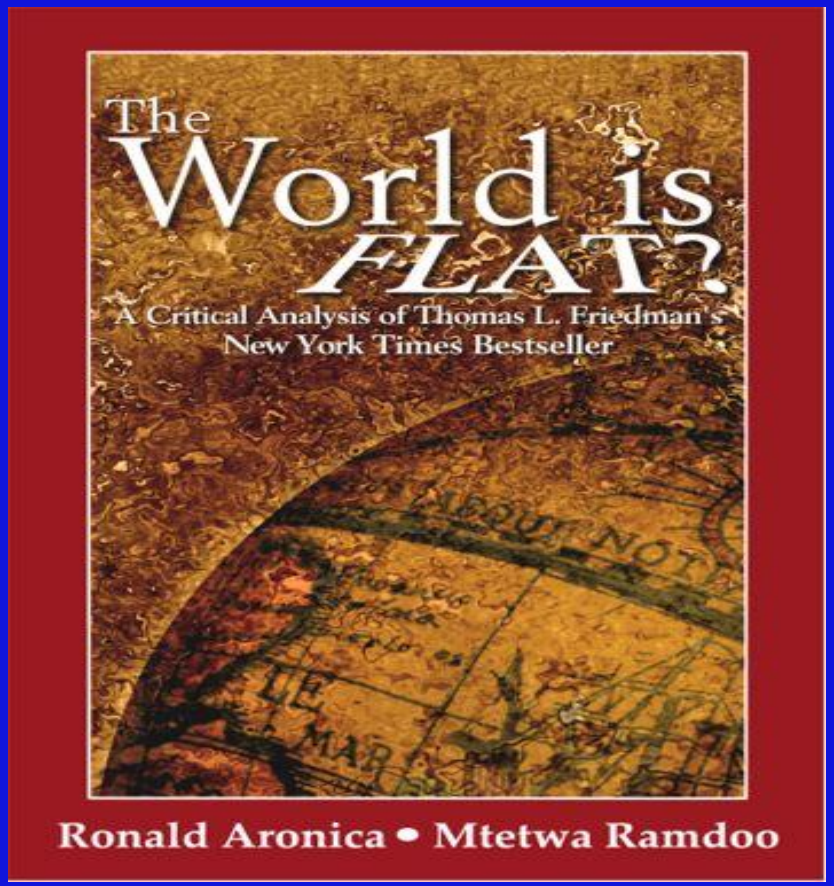
- Extreme weather
- Climate change
- Water resources
- Reduced farm lands

Competitive use of farm land, and increased cost of farming





Globalization requires a global approach



- Global demands on food
- Global climate change
- Global food safety
- Global terrorism
- Global competition
- Global cooperative initiatives

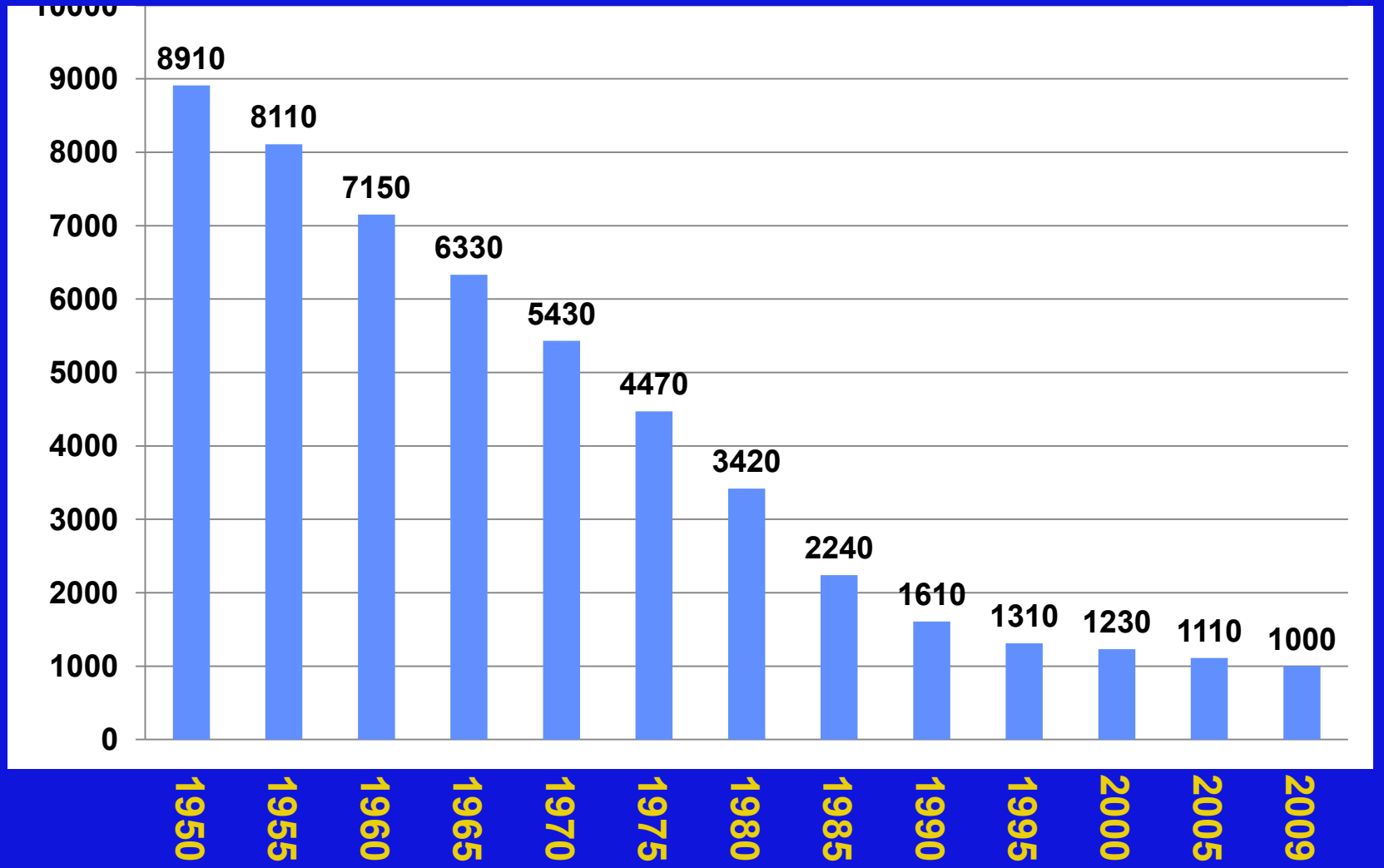
Current capacity: Landgrant system is best-positioned to take on the challenges

- 106 Land grant and 218 APLU institutions
- 645,000 faculty members, 3.5 million undergraduates, and 1.1 million graduate students.
- Research-extension integrated systems
- State, regional, and multistate research network

But must reenergize:

- Setting priorities
- Strengthen collaborations
- Training next generation of Ag scientists and labor force

Science Gaps: Ag Research Funding Has Declined in Real Value for Decades



Lawrence H. Officer and Samuel H. Williamson, "Purchasing Power of Money in the United States from 1774 to 2009," Measuring Worth, 2010. URL http://www.measuringworth.com/ppowerus/

US Must Invest Significant $$$ in Agriculture to Maintain Leadership Role in the World

- Purchasing powers of BRIC already 15% larger than US;
- China's economy alone will catch that of US in just short few decades;
- China and India train more engineers and Ph.D.'s than US;
- Significant Ag research investment by China, Brazil, and others.

Research Needs and Priorities

1. Maximize the genomic potential of plants and animals
2. Prevent, detect, monitor, control, and respond to food safety hazards
3. Develop trace technology for microbial, chemical, and physical food contaminants
4. Improve the nutritional values, diversity, and health benefits of food.
5. Detect and eliminate bioterrorism agents, invasive species, pathogens
6. Reduce dependence on chemicals such as pesticides, herbicides, and fungicides
7. Identify plant compounds that prevent chronic human diseases (e.g., cancer)
8. Plant and animal breeding
9. Examine the impacts of changes in the food supply and food transportation systems relative to preservation practices, safety, and energy efficiency
10. Develop food production regulatory policies
11. Enhance translational research and technology transfer
12. Develop cooperative international initiatives

Expected Outcomes

a safe, secure, and abundant food supply for the United States and the world.

Grand V Challenge

We must improve human health, nutrition and wellness of the U.S. population

Current Health Challenges

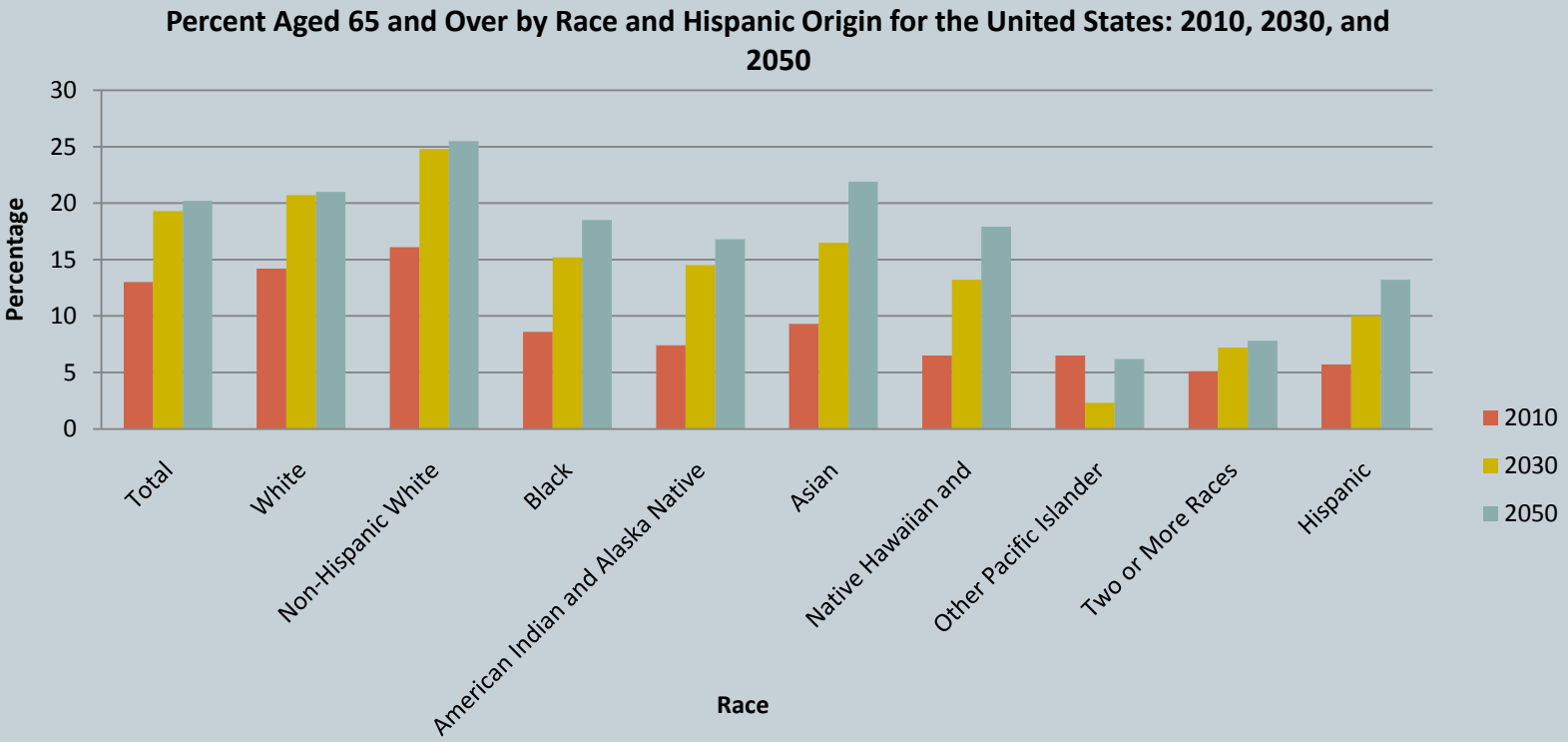
- Large health care costs(estimates range from $2.5 to $3 trillion in 2008 and 2009) in the United States create a need for innovation in disease prevention, medicine and public health
- 68% of the U.S. population age 20 or older is either overweight or obese. Lack of physical activity in children and adults.
- Negative changes in the food, physical and social environment.
- The aging population is more prone to chronic diseases such as arthritis, diabetes and cancer
- As obesity and diet-related disease rates increase in the United States, public health is further threatened by food-related issues such as antibiotic resistance; food, air, soil, and water contamination; natural resource depletion; and climate change .
- A transdisciplinary approach, encompassing many disciplines, must be used to address food system research and policy issues.

Negative Changes in the Food, Physical and Social Environment

- Low-cost food supply that is high in fat, sodium and added sugar.
- The availability of larger portion sizes consumed inside and outside of the home.
- Neighborhood designs leading to increased dependence on cars and less opportunities for physical activity.
- School policies that shorten lunch periods that allow the purchasing of sweetened beverages and snack foods.
- Decreased daily energy expenses and inactive lifestyles due to televisions, computers, etc.

✓ **These changes have been linked to the rise of obesity, as well as the subsequent increase in chronic disease.**

The Older Population in the United States: 2010, 2030 and 2050



According to a report by the U.S. Census Bureau, Between 2010 and 2050, the United States is projected to experience rapid growth in its older population. In 2050, the number of Americans aged 65 and older is projected to be 88.5 million, more than double its projected population of 40.2 million in 2010.

Age is Strongly Associated With Impairment in Activities in Daily Living

- 40% of Americans over age 65 exhibit one chronic disease, disability or other functional deficit.
- Our health care system is now shifting to accommodate an older population requiring complex (and expensive) care.
- 75% of all health care dollars are spent on older adults.

A System's Approach to Health and Nutrition

- Traditionally, single discipline approach.
- Consider the entire food system - production, harvesting, storing, transporting, processing distribution, consumption and disposal of food.
- A research approach that considers the entire food system and that connects agriculture with health and behavioral sciences through education and extension is required to truly understand the ways that the food system can improve human health

Disease Prevention and Optimal Health

- Disease prevention and optimal health are, to a large extent, due to behaviors in which individuals choose to engage (or not engage).
- It has been estimated that 50% of morbidity is due to behaviors that are under individuals' control, while the remaining portion is genetically predisposed.
- Aging processes encompass factors from the molecular level to the societal level and these factors affect not only the rate of functional decline but also the means to promote health and maintain quality of life.
- An understanding of the interactive effects on aging of nutrition, exercise, psychosocial factors, assistive technology and the built environment has the potential to mitigate declines that are associated with aging.
- Additionally there is a great need for researchers with the interdisciplinary background required to envision, study and understand these interactions and for professionals to meet the growing need of older Americans.

Technologies to Improve Health

- New science and technologies need to be advanced

  - ✓ Nutritional genomics or nutrigenomics, - how whole foods or food components affect the regulation of our genes and how individual genetic differences can affect the way we respond to nutrients (and other naturally occuring compounds) in foods we eat.
  - ✓ Exercise plays an important role in prevention or delay of chronic disease. It is clearly beneficial to heart and blood vessel health via novel mechanisms.
  - ✓ Nano-encapsulation can enhance health benefits of processed foods by providing protective barriers, flavor and taste making, controlled release and better dispersibility for water insoluble food ingredients and additives.
  - ✓ The microbial flora in the human gut is another important factor in human nutrition.

- Understanding that our increasing lifespan must be coupled with an increasing health span to improve human health and wellness.

Developing the Science to couple Diet and/or Physical Activity

- In adequate diet and/or physical activity can be serious risk factors for chronic diseases.
- The degree to which diet or exercise influences the balance between healthy diseased states may depend on an individual's genetic makeup.
- Diet and exercise regulated genes are likely to play roles in the onset, incidence, progression and/or severity of chronic diseases.
- Dietary intervention based on knowledge of nutritional requirement, nutritional status and epigenetics (i.e. "personalized nutrition") can be used to prevent, mitigate or cure chronic disease.
- The role of exercise in a healthy lifestyle .

Identifying Priority Areas Within Communities That Can Best Prevent Obesity in Children and Weight Gain in Adults

- Develop community-based participatory methods that identify priority areas within communities that can best prevent obesity in children and weight gain in adults.
- Develop cost-effective ways of providing healthy foods and adequate physical activity to children in child-care centers and schools.
- Determine what type of knowledge and skills, environment and support systems help children and adults make healthy lifestyle decisions related to food and physical activity and asses their impact.
- Carefully define the importance of exercise can provide motivation for developing practices that yield significant health benefits.

Policy Developments that Improve the Food, Physical and Social Environments

- At the community level, policies can improve neighborhood design with the potential to increase physical activity choices and improve accessibility to healthy foods.

- At the state level, policies that aim to improve the school environment could alter the availability of vending foods and increase the amount of physical activity available to their students.

- Nationally, policies that address advertising and marketing practices.

Summary of Research Needs and Priorities

- Asses whether organic and other sustainable production systems produce more nutritious or healthier foods.
- Comparisons of the Healthfulness of Food Products.
- Identifying Priority Areas Within Communities That Can Best Prevent Obesity in Children and Weight Gain in Adults.
- Using Environmental Scans.
- Understand healthy aging via a lifespan perspective.
- Understand factors that contribute to Chronic diseases and aging processes.
- Asses how cumulative biological and psychological stresses can create the “wear and tear” on the body.
- Investigate the potential of nutritional genomics.
- Asses nanocochleate-based nutrient delivery for micronutrients and antioxidants.
- Investigating the metabolic potential of gut microbes, after obtaining the bulk DNA.
- Expanding research on selection and breeding.

Thank you

Grand Challenge VI

We must Heighten Environmental Stewardship Through the Development of Sustainable Management Practices

Committee Composition

Regional ED & Coordinator - Eric Young

Science Leaders

Nancy Creamer – Director Center for Environmental Farming Systems – NCSU
Laurie Drinkwater – Dept. Horticulture – Cornell
Dan Herms – Dept. Entomology – OSU
James Kinder – Dept. Animal Sciences – OSU
Mark Risse – Dept. Biol. & Ag. Engineering - UGA

ESCOP Science & Technology Members

Steve Meredith – Lincoln University
Ambrose Anoruo – Delaware State University

Framing the Issue

Agriculture and the Environment

Agriculture transforms ecosystems and can undermine and degrade the integrity of environmental systems, with ensuing negative consequences for human health and well-being

- Resource Consumption
- Agricultural Emissions

General Research Approach

- Research must be systems-based – tools such as life-cycle analysis
- Must include long-term studies
- Must include processes occurring at larger than farm scale (watersheds)
- Measure Yields in terms of other resource use
  - i.e. yields relative to inputs and emissions

Research Needs and Priorities

1. Reduce the use of nonrenewable inputs in agricultural production
   - Agricultural Water Conservation
   - Protection of Water Quality by Reducing Soil, Chemical, Microbial, and Nutrient Runoff
   - Energy-Efficient Agriculture Systems, Including Food Distribution Networks and Bioenergy from Animal Manure and Crop Residues
   - Reduced Air Emission in Agriculture

Research Needs and Priorities

2. Assess the capacity of agriculture and other managed systems to provide market-based ecosystem services (OEM)
3. Enhance internal ecosystem service (e.g., nutrient cycling, pest control, and pollination) that support production outcomes so that chemical inputs can be reduced

Research Needs and Priorities

4. Assess food animal production in relation to ecosystem services
5. Develop innovative waste management technologies
6. Pursue systems-oriented and science-based policy and regulation for agricultural and other managed systems

Grand Challenge 7

Must Strengthen Individual, Family and Community Development & Resilience

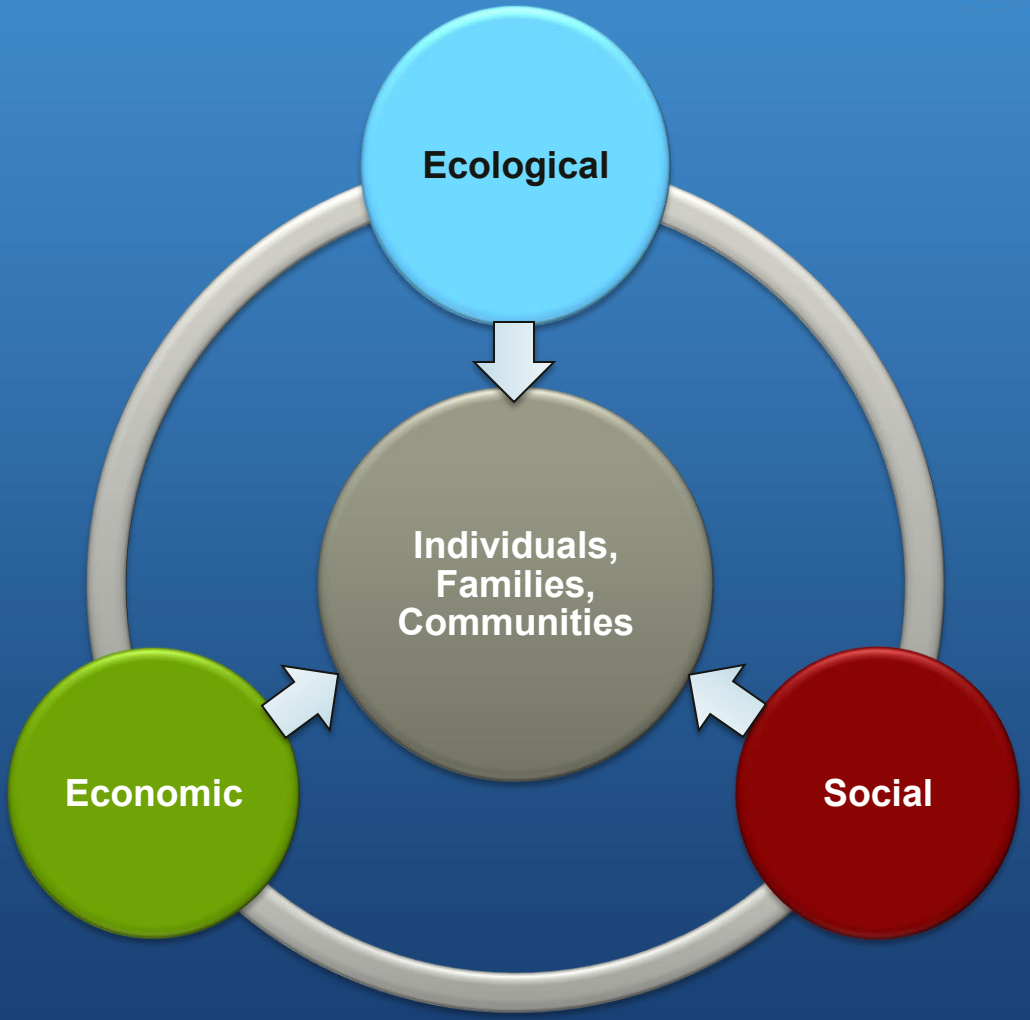
Bo Beaulieu
Southern Rural Development Center

Team Members

- Don Albrecht, WRDC
- Bo Beaulieu, SRDC
- B. Jan McCulloch, University of Minnesota
- Ed Osborne, University of Florida
- Travis Park, Cornell University
- Ann Tichamyer, Penn State University
- Bruce Weber, Oregon State University
- Dan Rossi, NERA – Executive Director

Issue Framing

Critical to explore the core challenges impacting individuals, families & communities in the context of these broad forces (economic, social, ecological) in rural America



The Priority Issues

1. Creating Supportive Family Environments
2. Fighting Obesity, Food Insecurity
3. Changing Economic Drivers
4. Still Left Behind: High Poverty Places
5. Staying in Touch Through Broadband
6. Understanding Ecosystem Change
7. Overcoming Apathy: Civic Health of Communities

Research Needs and Priorities

Supportive Family Environments

Many Stresses Impacting Today's Families

Key issues. . .

- Links between community vitality and strong healthy families
- How diverse families differentially experience economic & social opportunities in rural areas
- The key mix of family supportive programs/policies

Obesity & Food Insecurity

Child/adult obesity rates highest, food deserts most prevalent in rural areas; low rate of participation in federal child nutrition programs

Key Issues. . .

- Barriers to food security & access to healthy foods
- Impediments to local food production and direct marketing
- Effectiveness of local food systems

Research Needs and Priorities

Changing Economic Drivers

Economic Base is Changing; Major Debate on the Merits of People-, Sector-, and/or Place-Based Strategies

Key Issues. . .

- Determining the communities' comparative advantages (assets, niche markets)
- Factors that advance sustainable regional economic development strategies
- Links between urban and rural prosperity
- Attracting creative/knowledge workers
- Role of entrepreneurship and self-employment
- The move of resource-dependent communities from extraction/manufacturing to redevelopment based on resource stewardship

High Poverty Places

Approx. 9 of every 10 high poverty counties in the U.S. (20%+ of individuals in poverty) are in rural America (416 counties). Many geographic pockets of high poverty are in rural America

Key Issues. . .

- Impacts of globalization on rural poverty
- The chronic poor (Who are they? How do they differ from urban poor? What community factors affect poverty?)
- Types of work supports needed by the rural poor
- How population shifts influence poverty outcomes

Research Needs and Priorities

Straying in Touch Through Broadband

New rural economic development strategies will require access to information and communications technologies. But, broadband penetration and use are lowest in rural areas

Key Issues. . .

- Factors impeding/facilitating broadband adoption by individuals, families, local governments, businesses, etc..
- Link between broadband access and local economic expansion. Does broadband promote growth of creative/knowledge-based workers and firms?
- Economic and social benefits to rural communities
- Role of BTOP in accelerating broadband deployment and use by people and communities in unserved/underserved rural areas

Ecosystem Change

Human systems have contributed to environmental changes; human systems must adapt to predicted as well as uncertain environmental conditions/shifts

Key Issues. . .

- Effects of bio-fuel demand on rural communities; policies to ensure that costs/benefits are equitably distributed across the urban/rural continuum
- Vulnerability of agricultural regions to climate change; potential for economic adaption.
- Factors increasing the vulnerability of rural communities to climate change. Policy changes that might increase community resilience to global warming.
- Impact of increased urbanization and amenity growth on local ecosystems & land use activities

Research Needs and Priorities

Civic Health of Communities

The civic fabric of American communities is declining. New paradigms for restoring the civic health of communities are needed

Key issues. . .

- The value/benefit of civic capacity-building investments by local institutions
- How new modes of civic-centered engagement result in a broader array of people contributing to community improvement efforts
- The role of sustained youth engagement in reducing youth outmigration
- The value of social media strategies in deepening citizen awareness and increased input on key local issues

Value, Opportunities, Challenges

Social & Behavioral Sciences

Value:

- Informed the life choices of individuals and families
- Generated information on the advantages/disadvantages/consequences of economic, social and environmental decisions on individuals, families, communities
- Developed important theoretical frameworks and powerful empirical analytic tools
- Provided policy guidance and analysis

Opportunities:

- Great potential for research discoveries on resilience related to rural people and places
- A social/behavioral sciences lens is vital to addressing Science Roadmap issues
- Need faculty who can work in a trans-disciplinary environment (bridge builders); provide incentives for such teams
- Investments will produce solid policy-relevant information
- Work is crucial to shaping Extension-relevant programs targeted to rural people, families, places

Major research challenges:

- Declining financial support
- Lack of good data on rural people and places
- Qualitative studies are crucial – but expensive

National Institute of Food and Agriculture
www.nifa.usda.gov

Vision for NIFA, the National Institute of Food and Agriculture

2010 ESS/SAES/ARD Workshop
Nashville

Messages

- Reorganization has (finally!) taken place
  - Next steps: internal and external
- 2010: changes to processes and raising expectations; adapting to responses
- 2011 Taking the best forward to develop new approaches to accomplish goals for US agriculture and for the consumer

NIFA Mission Statement

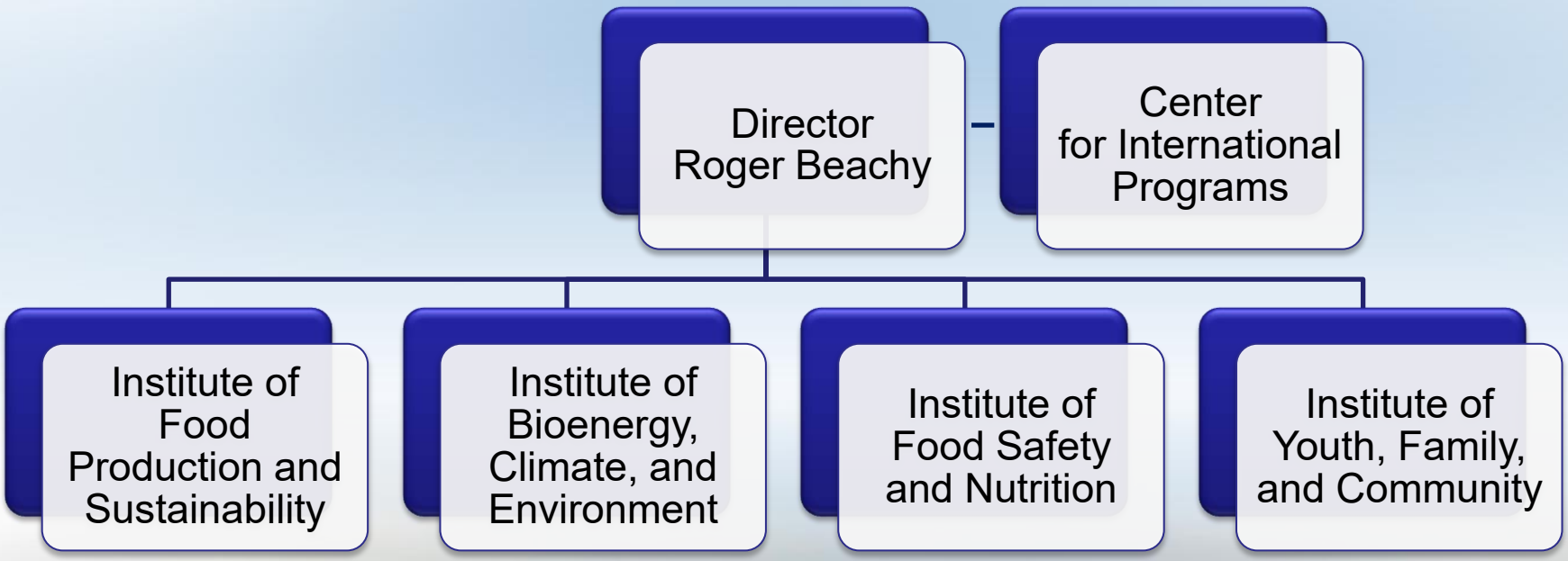
Leading Food and Agricultural Sciences to Create a Better Future for the Nation and the World

Refocusing NIFA Science in 2010

Focuses the outcomes from NIFA-sponsored activities around thematic areas:

1. Climate change
2. Bioenergy
3. Food safety
4. Nutrition and childhood obesity
5. Global food security

‘New’ STRUCTURE of NIFA



Administration and Functions of Institutes in NIFA

- Institutes to be led by scientists + effective administrators with experience in USDA policies,
- Will look to examples of best practices for operations of the institutes
- Avoid silo effect, encourage teamship, offer options for career development

Office of the Director

Roger Beachy

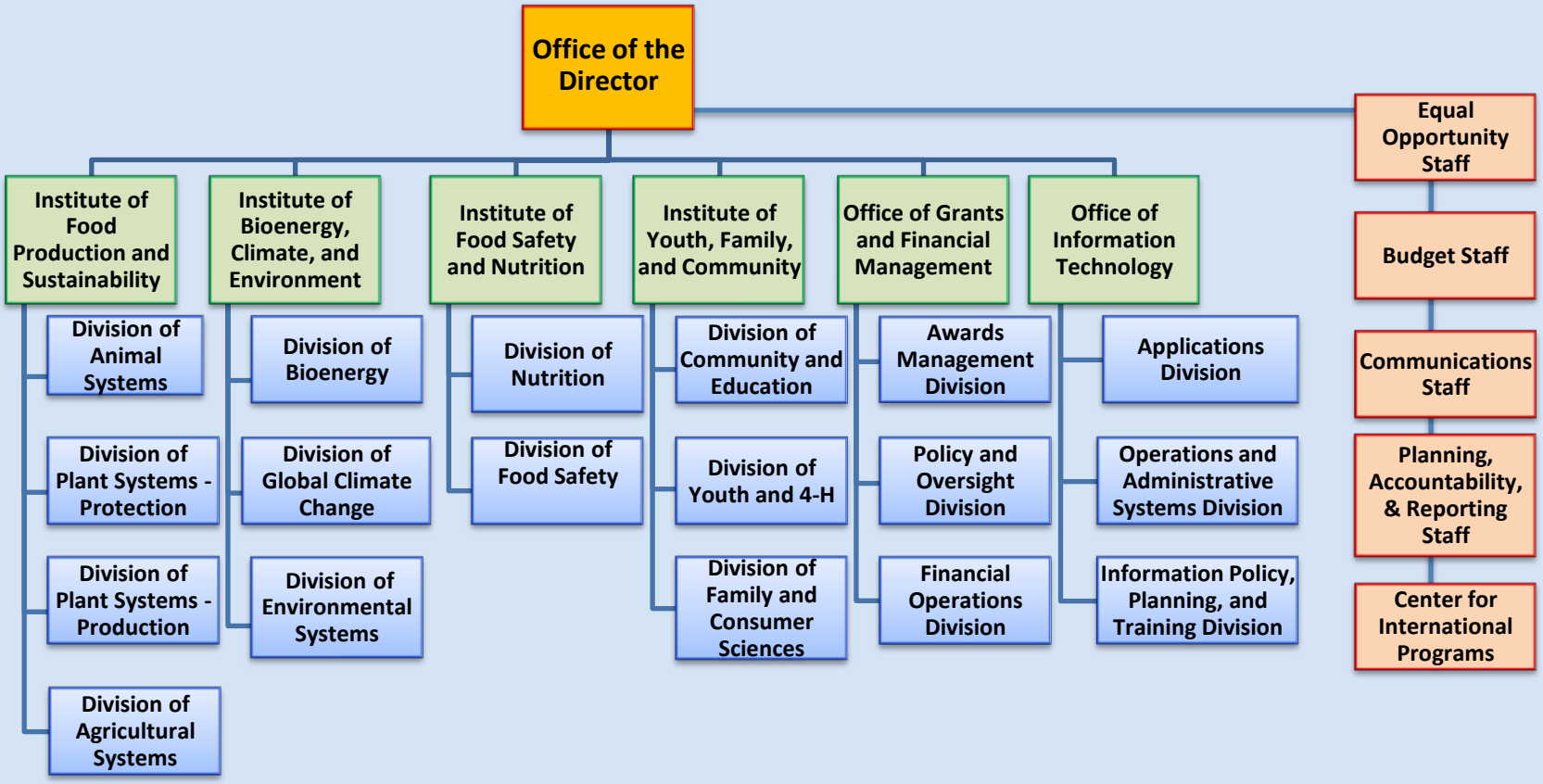
Director

Meryl Broussard
Deputy Director for Agriculture and Natural Resources

Ralph Otto
Deputy Director for Food and Community Resources

- Institute of Food Production and Sustainability
- Institute of Bioenergy, Climate, and Environment
- Institute of Food Safety and Nutrition
- Institute of Youth, Family, and Community
- Office of Grants and Financial Management
- Office of Information Technology


INVESTING IN SCIENCE | SECURING OUR FUTURE


Office of the Director
Equal Opportunity Staff
Budget Staff
Communications Staff
Planning, Accountability, & Reporting Staff
Center for International Programs
Institute of Food Production and Sustainability
Division of Animal Systems
Division of Plant Systems - Protection
Division of Plant Systems - Production
Division of Agricultural Systems
Institute of Bioenergy, Climate, and Environment
Division of Bioenergy
Division of Global Climate Change
Division of Environmental Systems
Institute of Food Safety and Nutrition
Division of Nutrition
Division of Food Safety
Institute of Youth, Family, and Community
Division of Community and Education
Division of Youth and 4-H
Division of Family and Consumer Sciences
Office of Grants and Financial Management
Awards Management Division
Policy and Oversight Division
Financial Operations Division
Office of Information Technology
Applications Division
Operations and Administrative Systems Division
Information Policy, Planning, and Training Division

National Institute of Food and Agriculture
www.nifa.usda.gov

INSTITUTE OF FOOD PRODUCTION AND SUSTAINABILITY

Enhancing global food security through productive and sustainable agricultural systems

INVESTING IN SCIENCE | SECURING OUR FUTURE

USDA

National Institute of Food and Agriculture
www.nifa.usda.gov

NIFA

INSTITUTE OF BIOENERGY, CLIMATE, AND ENVIRONMENT

Ensuring energy independence through clean, bio-based systems

Ensuring sustainable and adaptive agro-ecosystems in response to climate change

Deputy Director for Agriculture and Natural Resources
Meryl Broussard

Institute of Food Production & Sustainability
Assistant Director
Deborah Sheely

Principal Scientist
Vacant

- Division of Animal Systems
  Division Director
  M. Qureshi
- Division of Plant Systems - Protection
  Division Director
  M. Fitzner
- Division of Plant Systems - Production
  Division Director
  Vacant
- Division of Agricultural Systems
  Division Director
  B. Rein

Institute of Bioenergy, Climate, & Environment
Assistant Director
Frank Boteler

Principal Scientist
Vacant

- Division of Bioenergy
  Division Director
  M. Poth
- Division of Global Climate Change
  Division Director
  Vacant
- Division of Environmental Systems
  Division Director
  Vacant

Budget Staff

Director
Tina Buch

Communications Staff
Director
Vacant
Acting Director
Michel Desbois

Planning, Accountability, & Reporting Staff

Director
Robert MacDonald

USDA

National Institute of Food and Agriculture
www.nifa.usda.gov

NIFA

INSTITUTE OF FOOD SAFETY AND NUTRITION

Ensuring a safe food supply
Improving citizens' health through nutrition
Reducing childhood obesity
Improving food quality

INVESTING IN SCIENCE | SECURING OUR FUTURE

USDA

National Institute of Food and Agriculture
www.nifa.usda.gov

NIFA

INSTITUTE OF YOUTH, FAMILY, AND COMMUNITY

Enabling vibrant and resilient communities
Preparing the next generation of scientists
Enhancing science capacity in minority-serving institutions
Enhancing youth development

INVESTING IN SCIENCE | SECURING OUR FUTURE

USDA

National Institute of Food and Agriculture
www.nifa.usda.gov

Deputy Director for Food and Community Resources
Ralph Otto

Institute of Food Safety & Nutrition
Assistant Director
Vacant
Acting Ralph Otto

Principal Scientist
Vacant

- Division of Nutrition
  Division Director
  Vacant
- Division of Food Safety
  Division Director
  Vacant

Institute of Youth, Fam. & Community
Assistant Director
Dan Kugler
(on Detail)
Acting Ralph Otto
Principal Scientist
Vacant

- Division of Community and Education
  Division Director
  J. Tupas
- Division of Youth and 4-H
  Division Director
  L. Lauxman
- Division of Family and Consumer Sciences
  Division Director
  Vacant

Office of Grants & Financial Management
Assistant Director
Andrea Brandon

- Awards Management Division
  Division Director
  C. Langguth
- Policy and Oversight Division
  Division Director
  E. Danus
- Financial Operations Division
  Division Director
  T. Johnson

Office of Information Technology
Assistant Director
Michel Desbois

- Applications Division
  Division Director
  D. Unglesbee
- Operations and Administrative Systems Division
  Division Director
  D. Williams
- Information Policy, Planning, and Training Division
  Division Director
  J. Hitchcock

Equal Opportunity Staff
Director
Curt Deville

Center for International Programs
Director
Hiram Larew

USDA

National Institute of Food and Agriculture
www.nifa.usda.gov

NIFA

CENTER FOR INTERNATIONAL PROGRAMS

Leveraging the knowledge and commitment of U.S. talent to enhance the lives of those in developing countries

INVESTING IN SCIENCE | SECURING OUR FUTURE

NIFA's Next Steps

- Establish a Science Leadership Council
- Establish Mission Critical Chartered Teams
- Establish a Competitive Programs Task Force
- Establish an Infrastructure and Capacity Programs Task Force
- Establish a Science Policy Task Force

NIFA's Next Steps (cont.)

- Establish Principal Scientist positions for each of the new Institutes
- Ensure that educational functions of NIFA are effectively integrated across the agency
- Ensure that NIFA is recognized as a globally engaged science agency
- Establish a Human Capital Development Task Force for NIFA
- Establish a NIFA – 'Best Place to Work Initiative'

2010 in Review

- **RFAs released relatively late**
- **CAP-like grants: focus on USG/USDA goals; requiring formation of multidisciplinry teams; R+E/E; outcomes oriented; engaging 1890s, 1994, HSI institutions**
- **Foundational programs retained, with reduced scope and funding**

Future Opportunities for Research through NIFA if Budgets Grow

- Challenge programs will continue
- Foundational programs will grow as resources grow: searching for a balanced portfolio (30-70)
- NIFA programs will be complementary and collaborative with research sponsored by NSF, NIH, DOE, CDC, and other agencies

Planning for 2011

- **Currently developing RFAs following broad listening to stakeholders; target release - 12/2010**
- **Planning for modest increase (or flat?) in funding for AFRI**
- **Striving for greater integration w/in REE; and addressing research needs of other USDA mission areas**
- **Respecting Congressional mandates and seeking flexibility in programs**
- **Encourage 'dual function' research, education/extension to encourage co-funding by USAID for Feed the Future initiative**

National Institute of Food and Agriculture
www.nifa.usda.gov

Who are the Next Generation of 'Agricultural Scientists'?

- Classical and advanced agricultural sciences
- Non-agricultural scientists (physicists, chemists, informaticians, nutritionists, biomedical scientists)
- Social, economic, policy making, communications
- NIFA is leading a USDA-wide discussion on education/training/scholarship of next generation

National Institute of Food and Agriculture
www.nifa.usda.gov

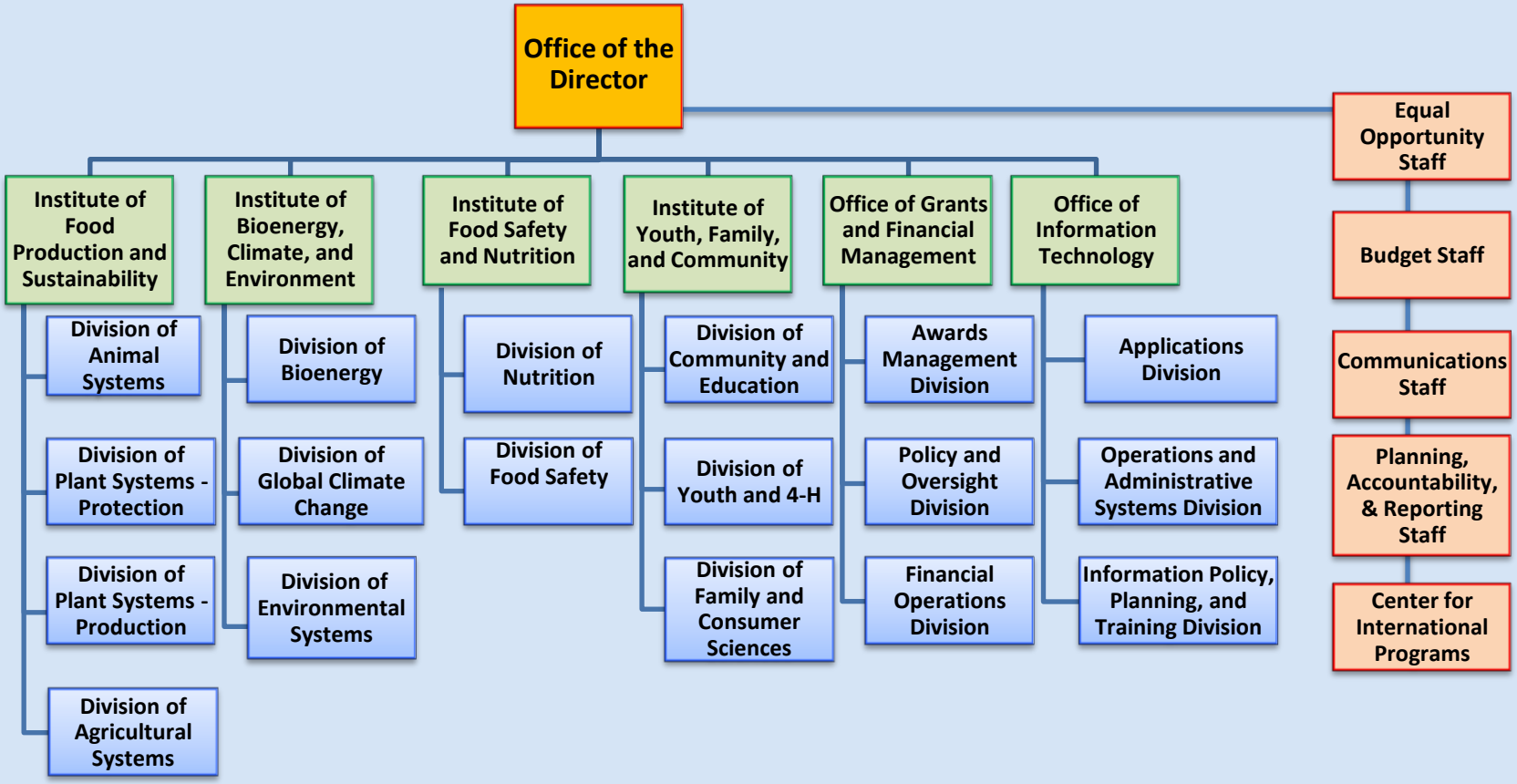
Vision for NIFA, the National Institute of Food and Agriculture

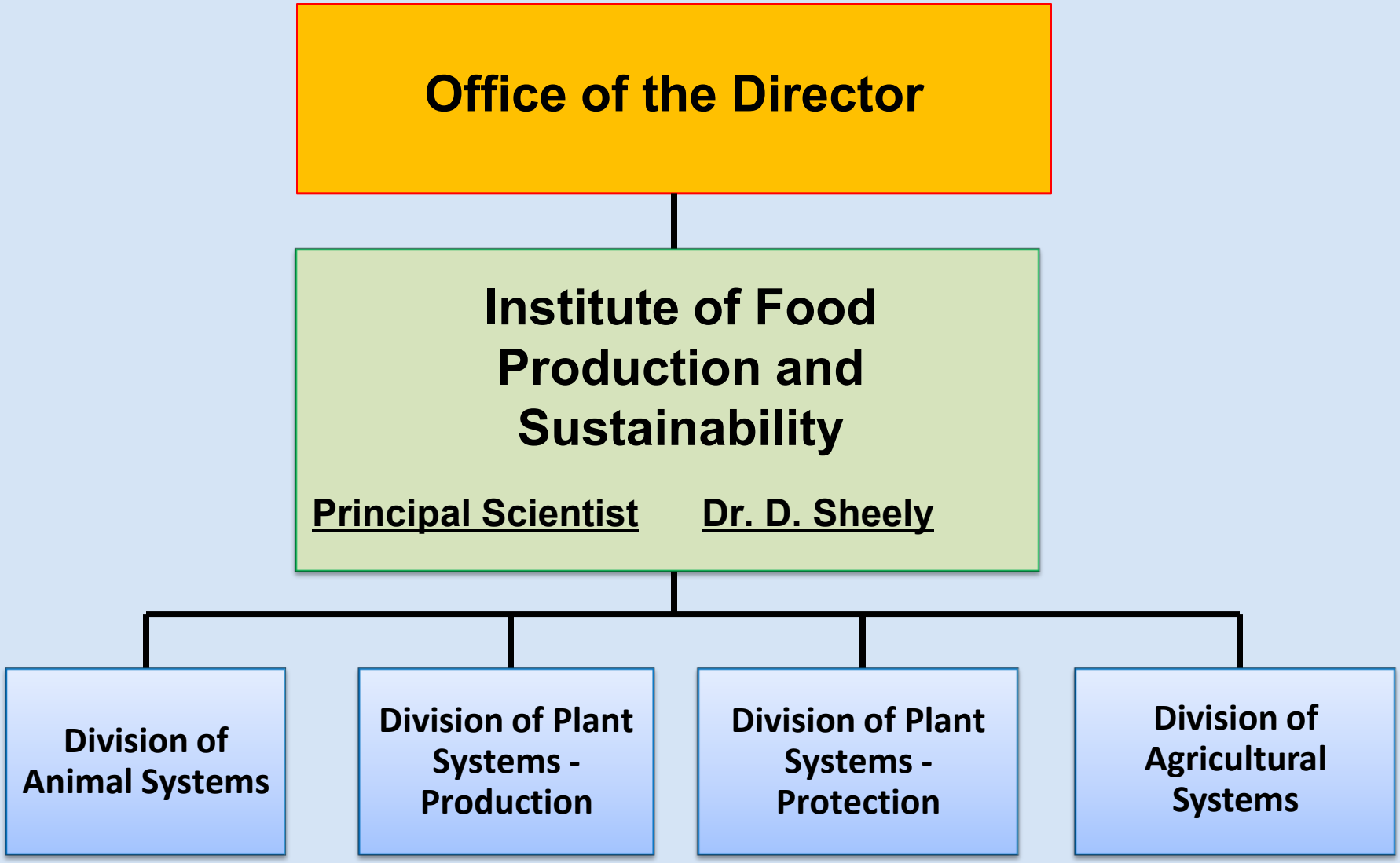
2010 ESS/SAES/ARD Workshop
Nashville

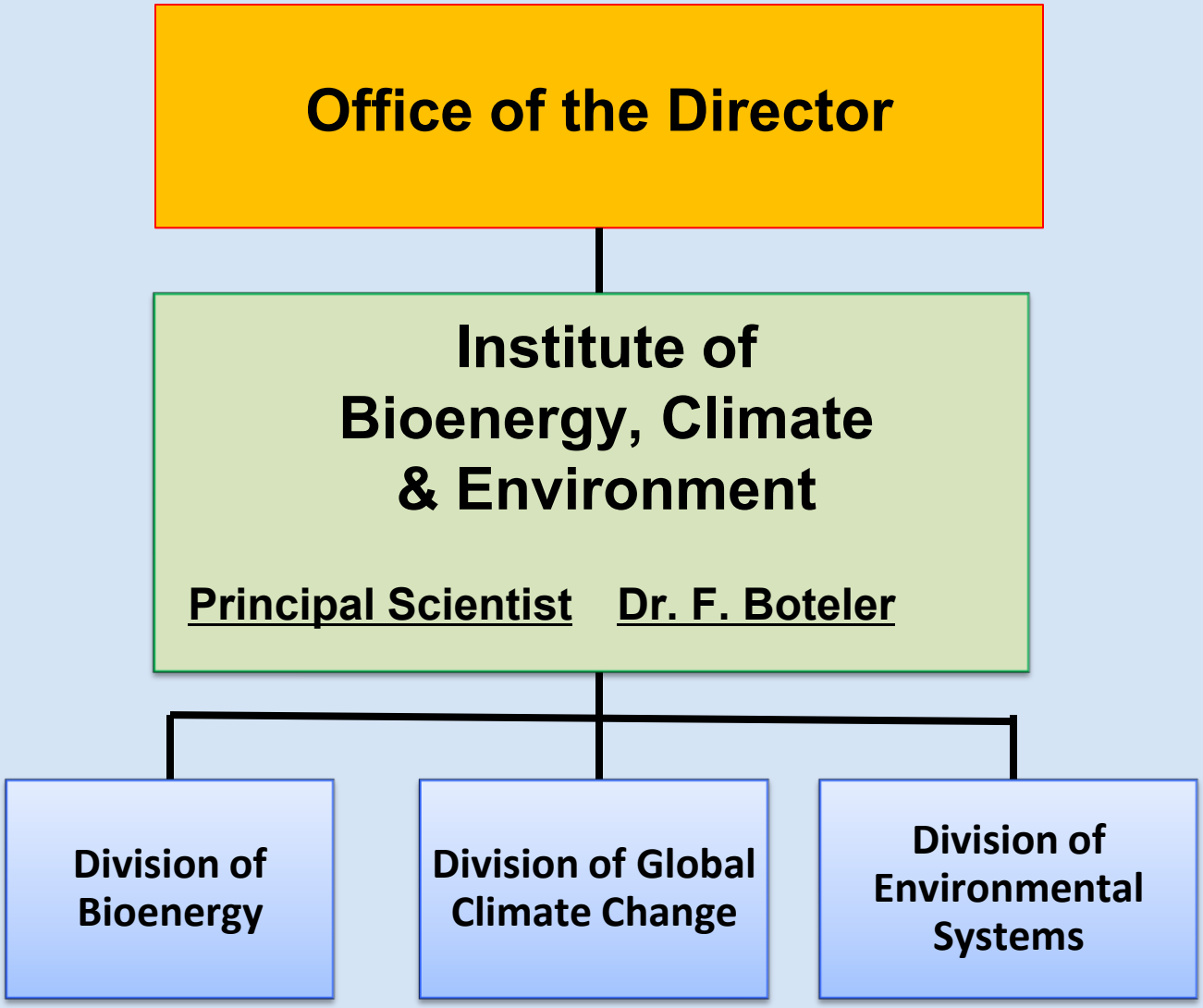
USDA NIFA

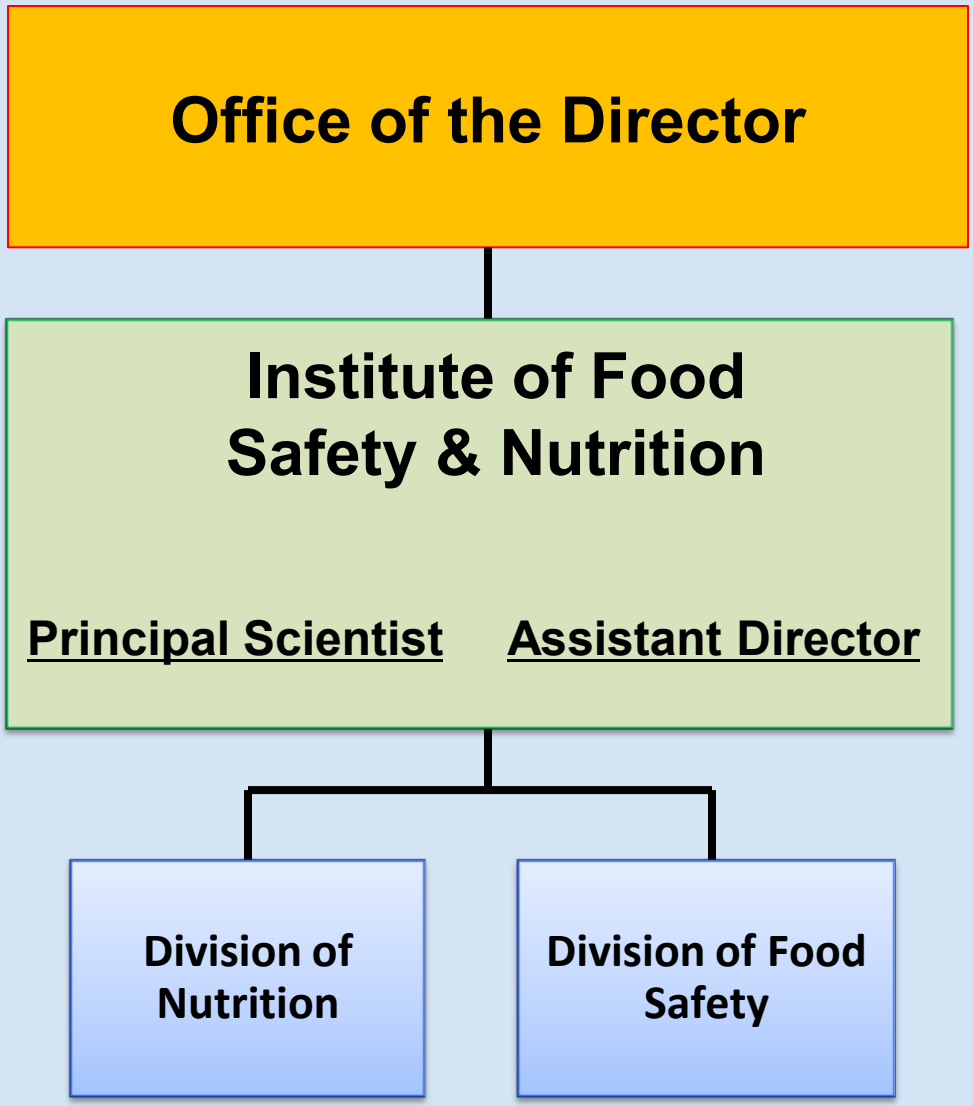
INVESTING IN SCIENCE | SECURING OUR FUTURE

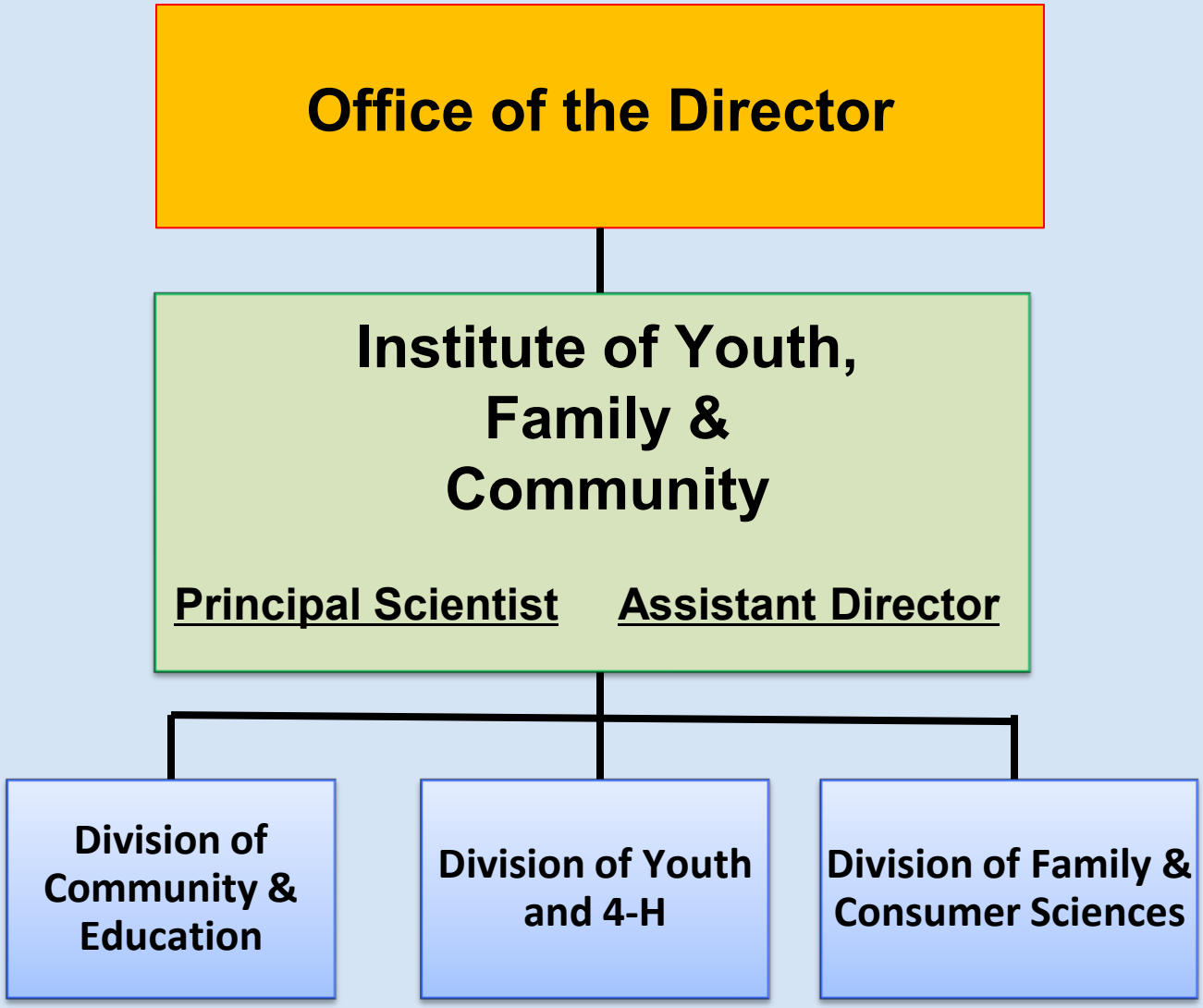
NATIONAL INSTITUTE OF FOOD AND AGRICULTURE | U.S. DEPARTMENT OF AGRICULTURE | WWW.NIFA.USDA.GOV

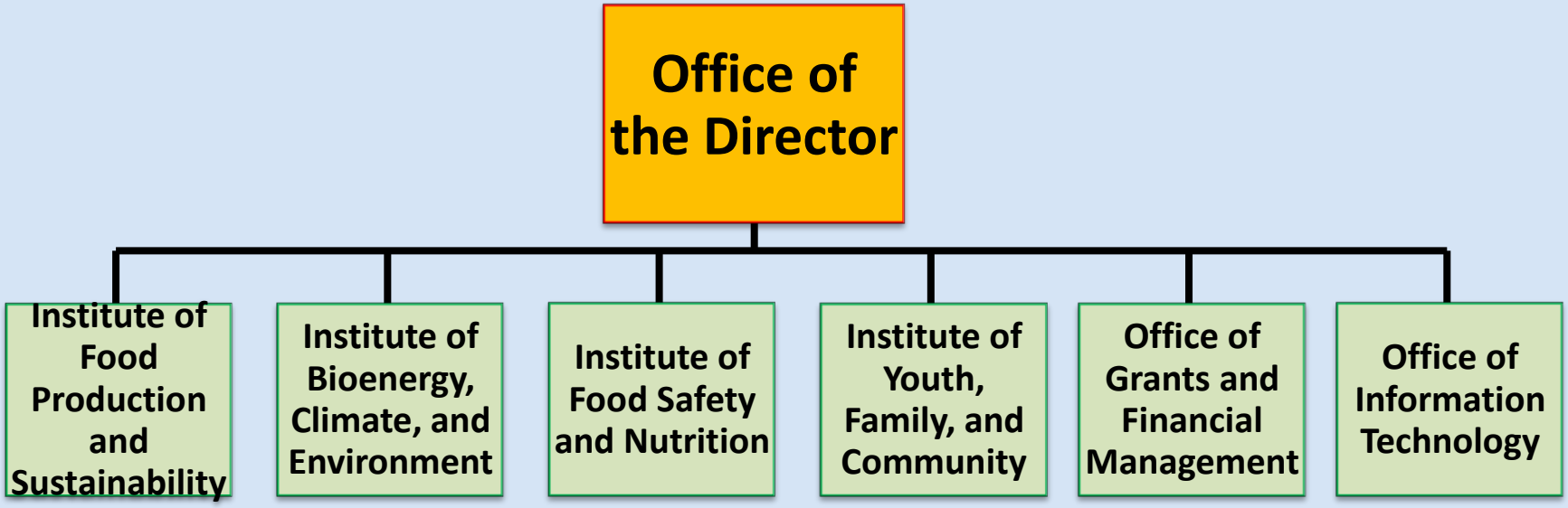

Office of the Director
Equal Opportunity Staff
Budget Staff
Communications Staff
Planning, Accountability, & Reporting Staff
Center for International Programs
Institute of Food Production and Sustainability
Division of Animal Systems
Division of Plant Systems - Protection
Division of Plant Systems - Production
Division of Agricultural Systems
Institute of Bioenergy, Climate, and Environment
Division of Bioenergy
Division of Global Climate Change
Division of Environmental Systems
Institute of Food Safety and Nutrition
Division of Nutrition
Division of Food Safety
Institute of Youth, Family, and Community
Division of Community and Education
Division of Youth and 4-H
Division of Family and Consumer Sciences
Office of Grants and Financial Management
Awards Management Division
Policy and Oversight Division
Financial Operations Division
Office of Information Technology
Applications Division
Operations and Administrative Systems Division
Information Policy, Planning, and Training Division

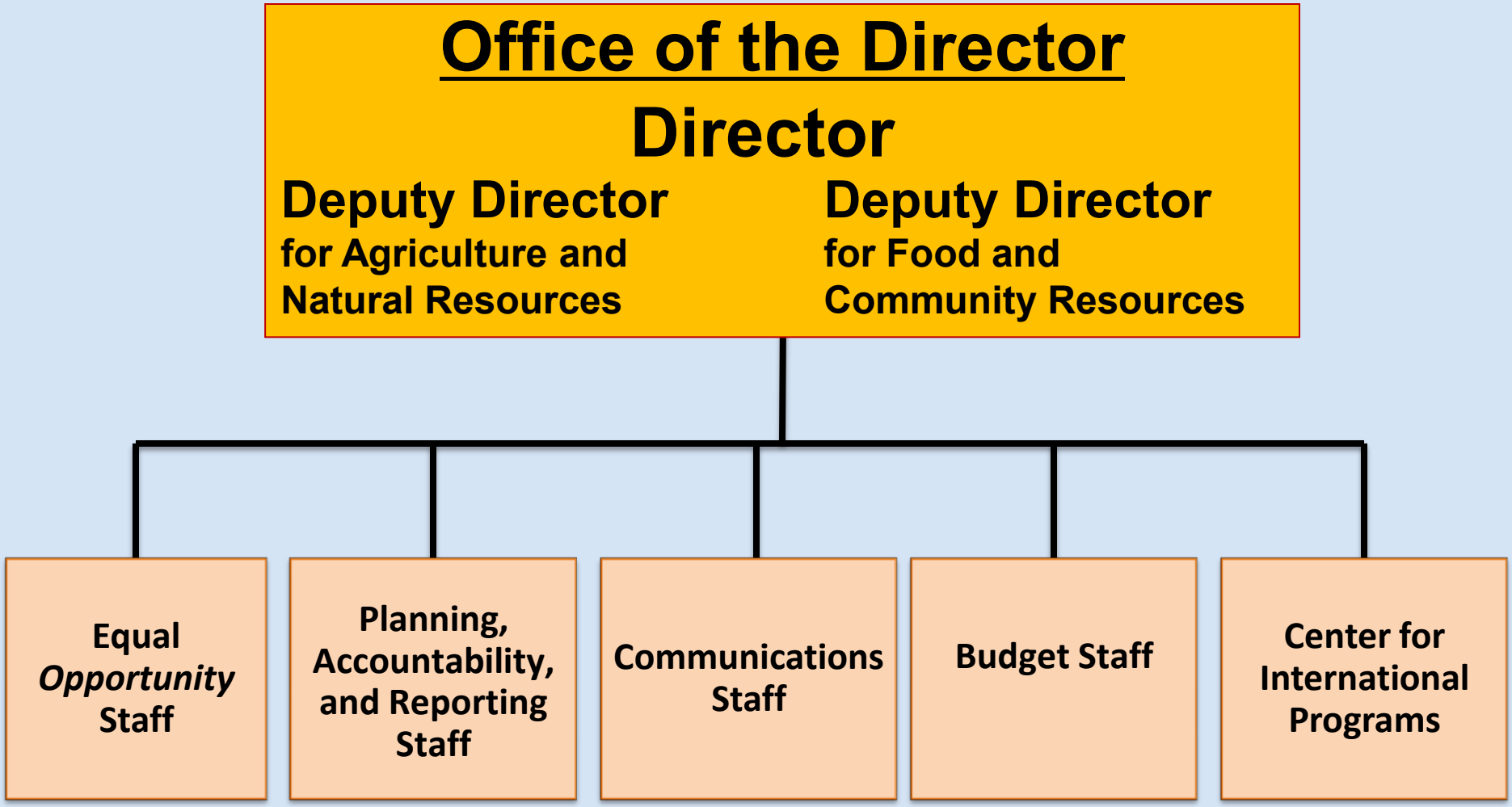

Office of the Director
Institute of Food Production and Sustainability
Principal Scientist
Dr. D. Sheely
Division of Animal Systems
Division of Plant Systems - Production
Division of Plant Systems - Protection
Division of Agricultural Systems

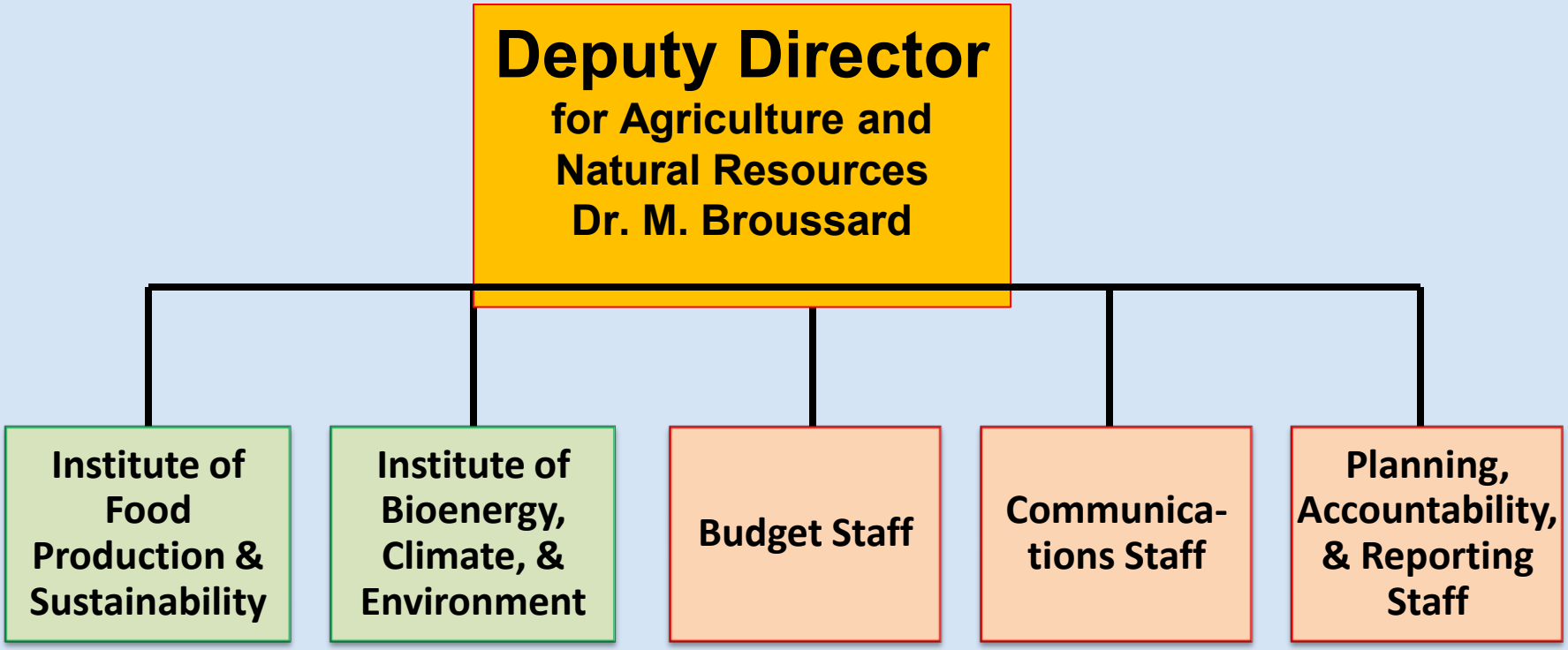

Office of the Director
Institute of Bioenergy, Climate & Environment
Principal Scientist Dr. F. Boteler
Division of Bioenergy
Division of Global Climate Change
Division of Environmental Systems

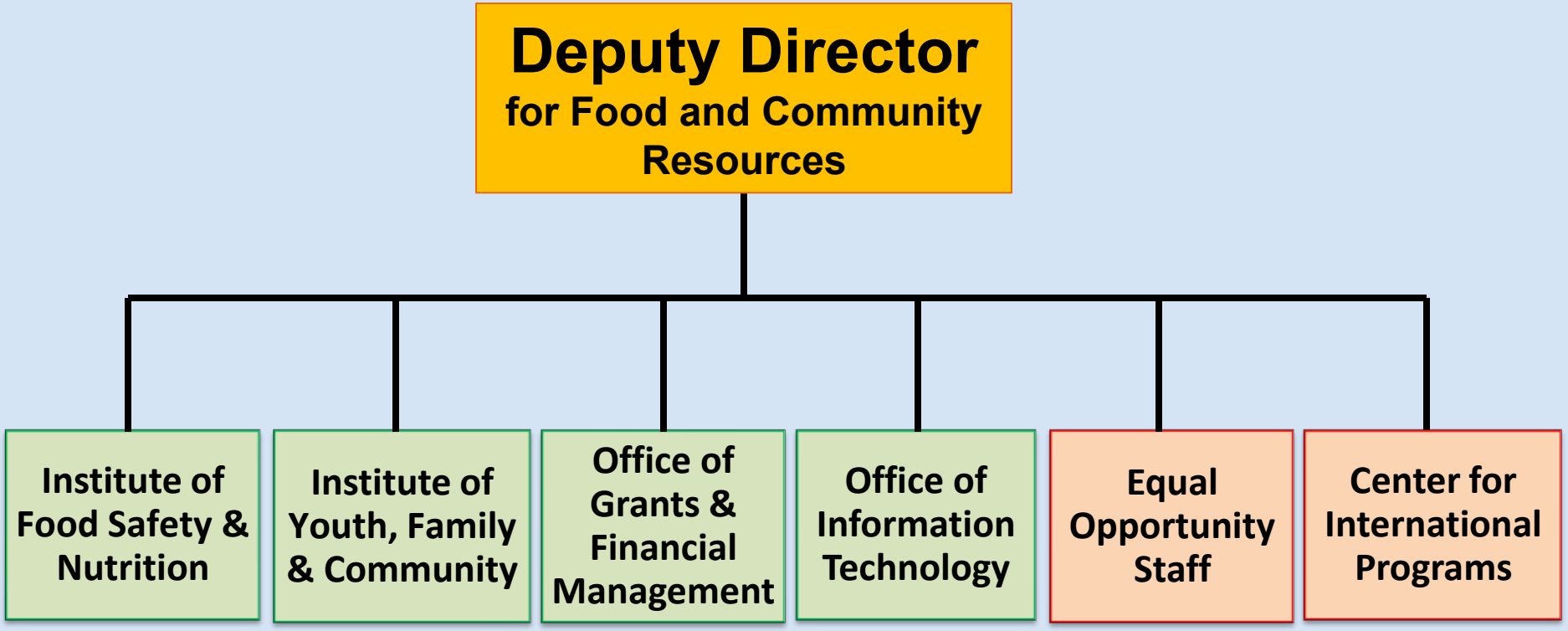

Office of the Director
Institute of Food Safety & Nutrition
Principal Scientist
Assistant Director
Division of Nutrition
Division of Food Safety

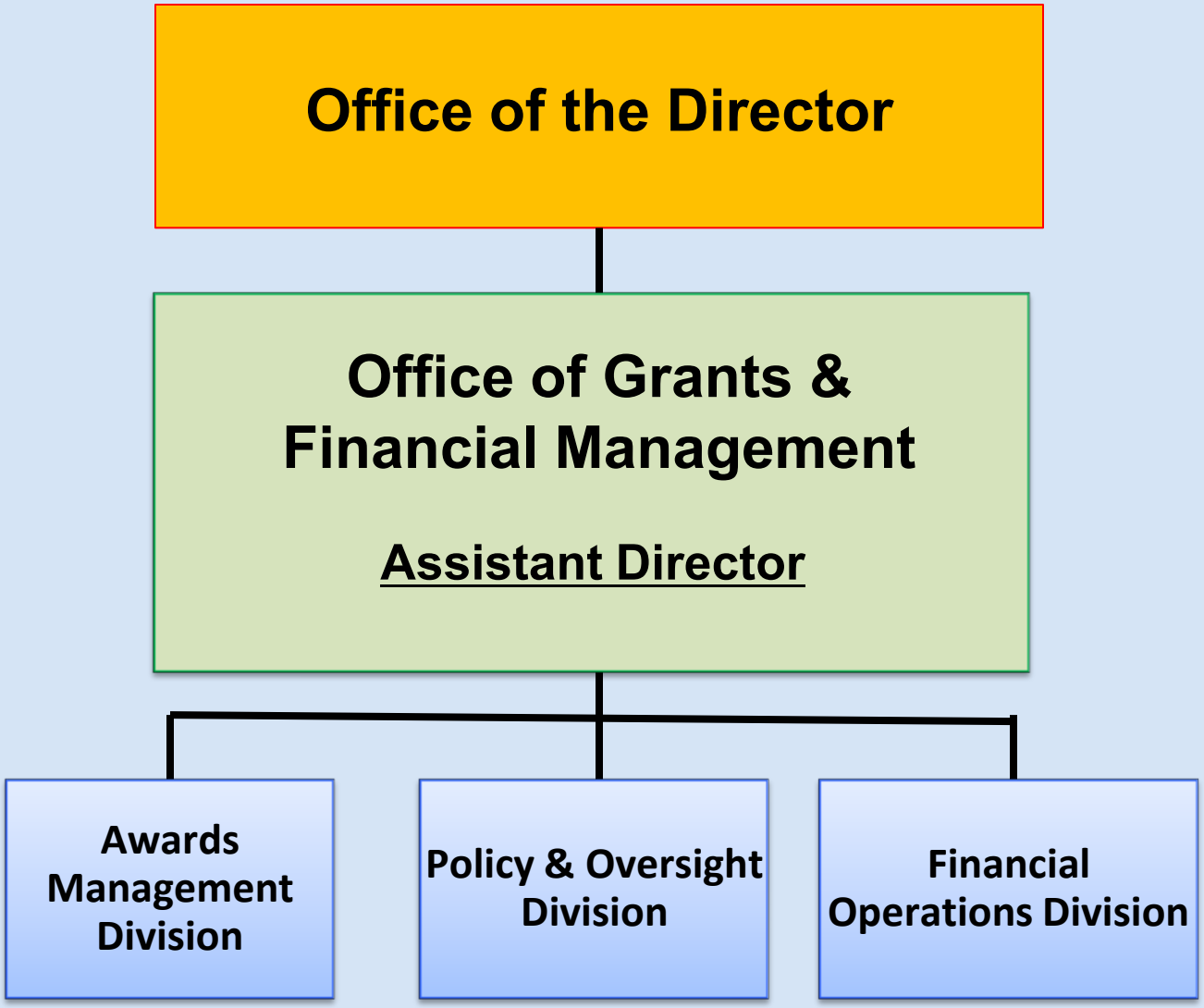

Office of the Director
Institute of Youth, Family & Community
Principal Scientist
Assistant Director
Division of Community & Education
Division of Youth and 4-H
Division of Family & Consumer Sciences


Office of the Director
Institute of Food Production and Sustainability
Institute of Bioenergy, Climate, and Environment
Institute of Food Safety and Nutrition
Institute of Youth, Family, and Community
Office of Grants and Financial Management
Office of Information Technology


Office of the Director
Director
Deputy Director
for Agriculture and
Natural Resources
Deputy Director
for Food and
Community Resources
Equal
Opportunity
Staff
Planning,
Accountability,
and Reporting
Staff
Communications
Staff
Budget Staff
Center for
International
Programs


Deputy Director
for Agriculture and
Natural Resources
Dr. M. Broussard
Institute of Food Production & Sustainability
Institute of Bioenergy, Climate, & Environment
Budget Staff
Communica-tions Staff
Planning, Accountability, & Reporting Staff


Deputy Director
for Food and Community Resources
Institute of Food Safety & Nutrition
Institute of Youth, Family & Community
Office of Grants & Financial Management
Office of Information Technology
Equal Opportunity Staff
Center for International Programs


Office of the Director
Office of Grants & Financial Management
Assistant Director
Awards Management Division
Policy & Oversight Division
Financial Operations Division

Office of the Director

Office of Information Technology

Assistant Director

- **Application Division**
- **Operations & Administrative Systems Division**
- **Information Policy, Planning & Training Division**

National Institute of Food and Agriculture
www.nifa.usda.gov

NIFA: An Agency To Be Proud Of

INVESTING IN SCIENCE | SECURING OUR FUTURE

Update on the Agricultural Research Service

for

ESS/SAES/ARD Workshop

Nashville, Tennessee

September 29, 2010

Edward B. Knipling
Administrator

United States Department of Agriculture

1400 Independence Avenue, SW
Room 302-A
Jamie L. Whitten Federal Building
Washington, DC 20250

Agricultural Research Service

202-720-3656 (voice)
202-720-5427 (fax)
edward.knipling@ars.usda.gov

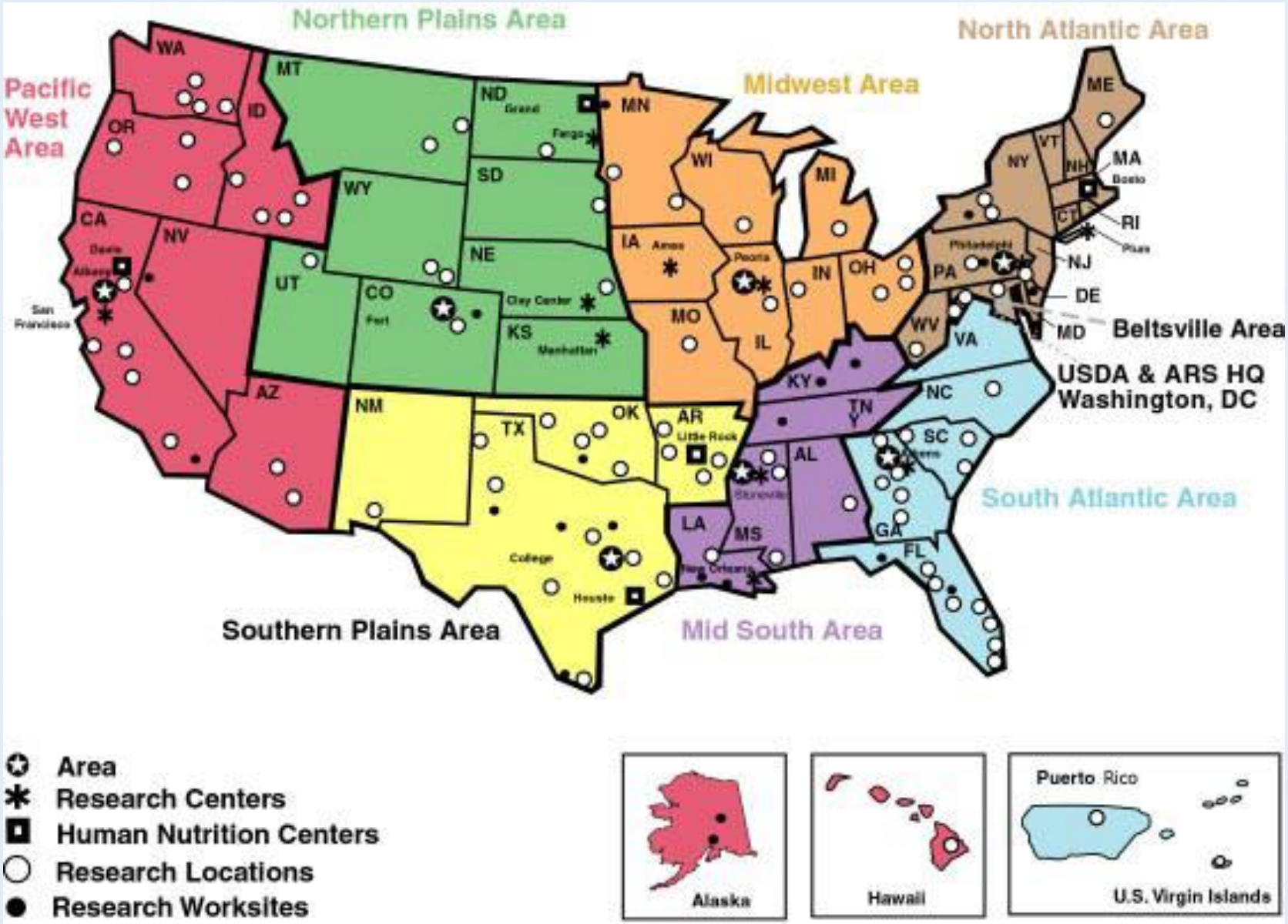
ARS Profile

(*http://www.ars.usda.gov*)

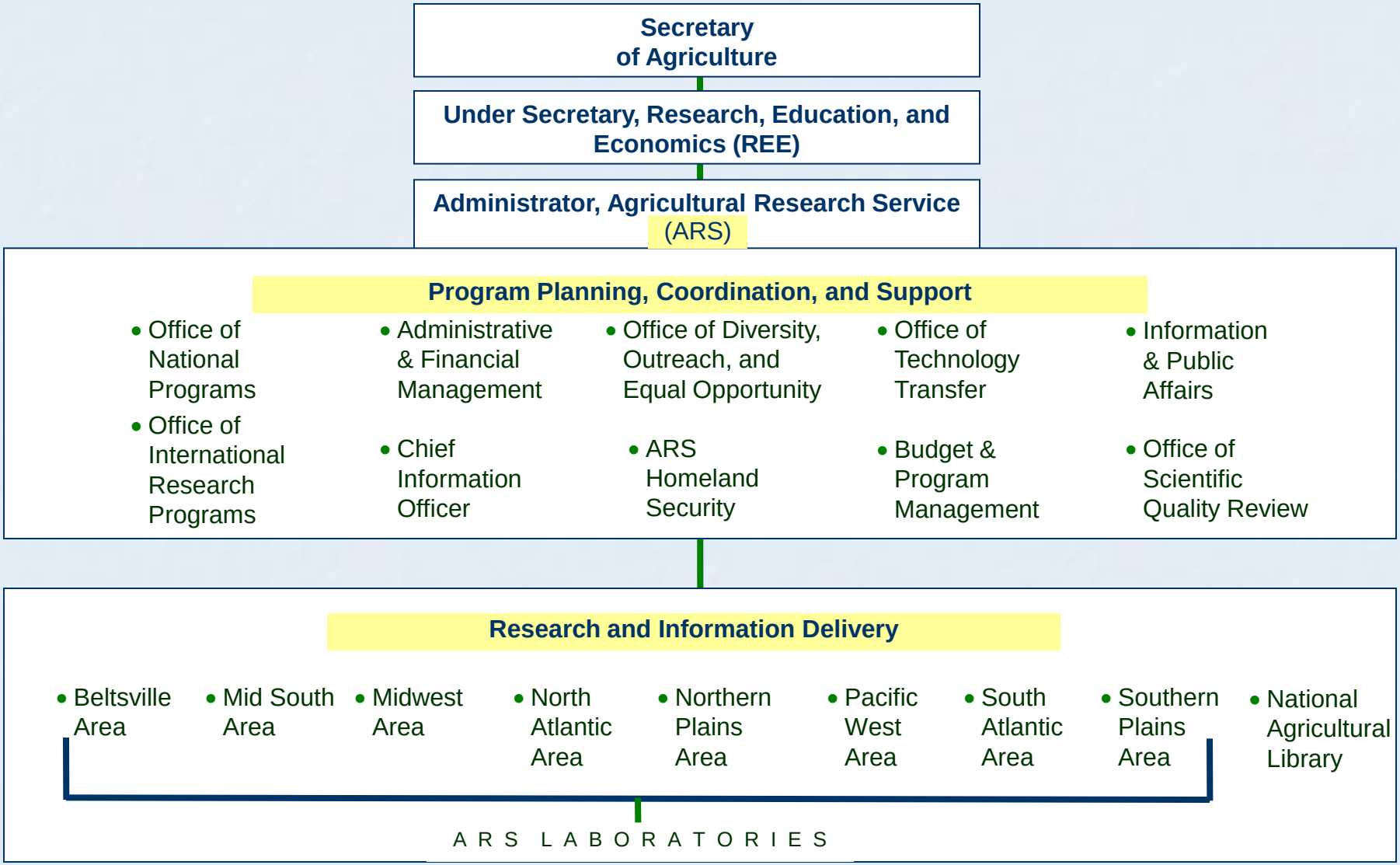
- Intramural scientific research agency of USDA
- Farm-to-table research scope
- Information and technology transfer
- Administration and stakeholder priority setting process
- National Research Programs

- 1,000+ projects
- 2,500+ scientists and post docs
- 6,500+ other employees
- 100+ laboratories; 5 overseas laboratories
- $1.2 billion annual budget
- Partnerships with other agencies, universities, and industry
- International collaborations

ARS Locations



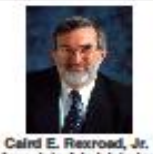
ARS Organization: Matrix Line and Staff



Administrator's Council
Agricultural Research Service

Judith B. St. John
Associate Administrator
National Programs

Edward B. Knipling
Administrator



Caird E. Rexroad, Jr.
Associate Administrator
Research Operations

Office of National Programs

Steven M. Kappes
Deputy Administrator,
National Program Staff
Animal Production & Protection

Steven R. Shafer
Deputy Administrator,
National Program Staff
Natural Resources & Sustainable Agricultural Systems

Photo unavailable

Sally M. Schneider
Acting Deputy Administrator,
National Program Staff
Crop Production & Protection

Molly Kretsch
Deputy Administrator,
National Program Staff
Nutrition, Food Safety & Quality

Area and NAL Directors

Wilbert H. Blackburn
Director,
Northern Plains Area

Deborah Brennan
Director,
South Atlantic Area

Dan R. Upchurch
Director,
Southern Plains Area

Larry Chandler
Director,
Midwest Area

Joseph T. Spence
Director,
Beltsville Area

Andy Hammond
Director,
Pacific West Area

Edgar G. King, Jr.
Director,
Mid South Area

Dariusz Swietlik
Director,
North Atlantic Area

Simon Liu
Director,
National Agricultural Library

ARS Program Scope and Capacities
(Disciplines, Funding, and Infrastructure)

Natural Resources and Sustainable Agricultural Systems	Crop Production and Protection	Animal Production and Protection	Nutrition, Food Safety and Quality
(~20%)	(~40%)	(~15%)	(~25%)

USDA Research Priorities & Targeted Outcomes

- Climate Change
- Bioenergy/Biofuels
- Human Nutrition/Obesity Prevention/ Children's Health
- Food Safety
- Global Food Security

ARS Budget Status and Outlook

	($000s)	Net Change ($Ms)
FY 2010 Appropriation (*current*)	1,179,693	--
FY 2011 President's Budget	1,199,669	+20
FY 2011 Senate	1,216,815	+37
FY 2011 House	~1,190,000	+10
FY 2011 Conference/Appropriation *(Anticipate Continuing Resolution)*	?	?
FY2012 President's Budget	?	?

Some Program Initiatives

- Genetic Resources
- Biomass/Bioenergy Centers
- Global Research Alliance on Agricultural Greenhouse Gases
- President's Task Force on Childhood Obesity
- Feed the Future/Borlaug Research Initiative
- Agriculture Technology Innovation Partnerships (ATIP)

Some Management Initiatives

- Extramural Agreements Management
- Capital Investment Strategy
- Cultural Transformation

ARS Values and Appreciates our SAES and ARD Partnerships

THANKS!

Developing and Managing Large Integrated Grants

Sanjiv Singh
Research Professor, Carnegie Mellon University
Project Director, Comprehensive Automation for Specialty Crops (CASC)

Marcel Bergerman
CASC Project Manager

Outline

- Background

- Act 1: Finding a Fit with SCRI
- Act 2: Writing a Winning Proposal
- Act 3: Managing the project

Background: Robotics Institute, CMU

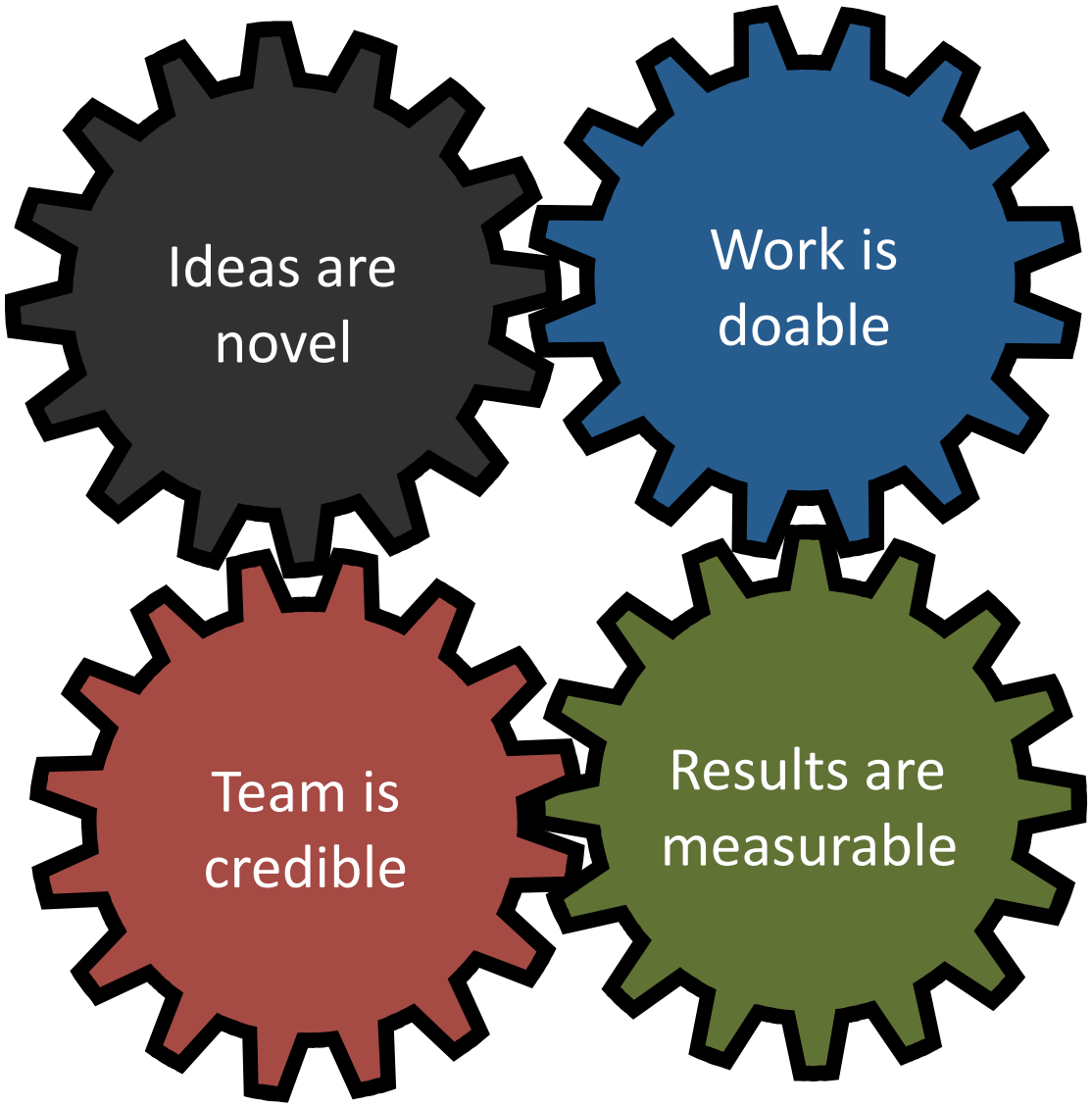
- Created in 1983
- ~500 people working on broad range of technologies
- Growing 10%/year; doubling in size every 6 years
- Approx. $60M/year budget. Department brought in its Billionth dollar in Sep 2010.
- Largest department at Carnegie Mellon
- Majority of faculty in “soft money” positions
- Funding from DOD, NSF, NASA, corporations
- Long history of collaboration between researchers, universities, users and corporations
- Commonly put together large proposals (> $1M/year)

Personal Motivation

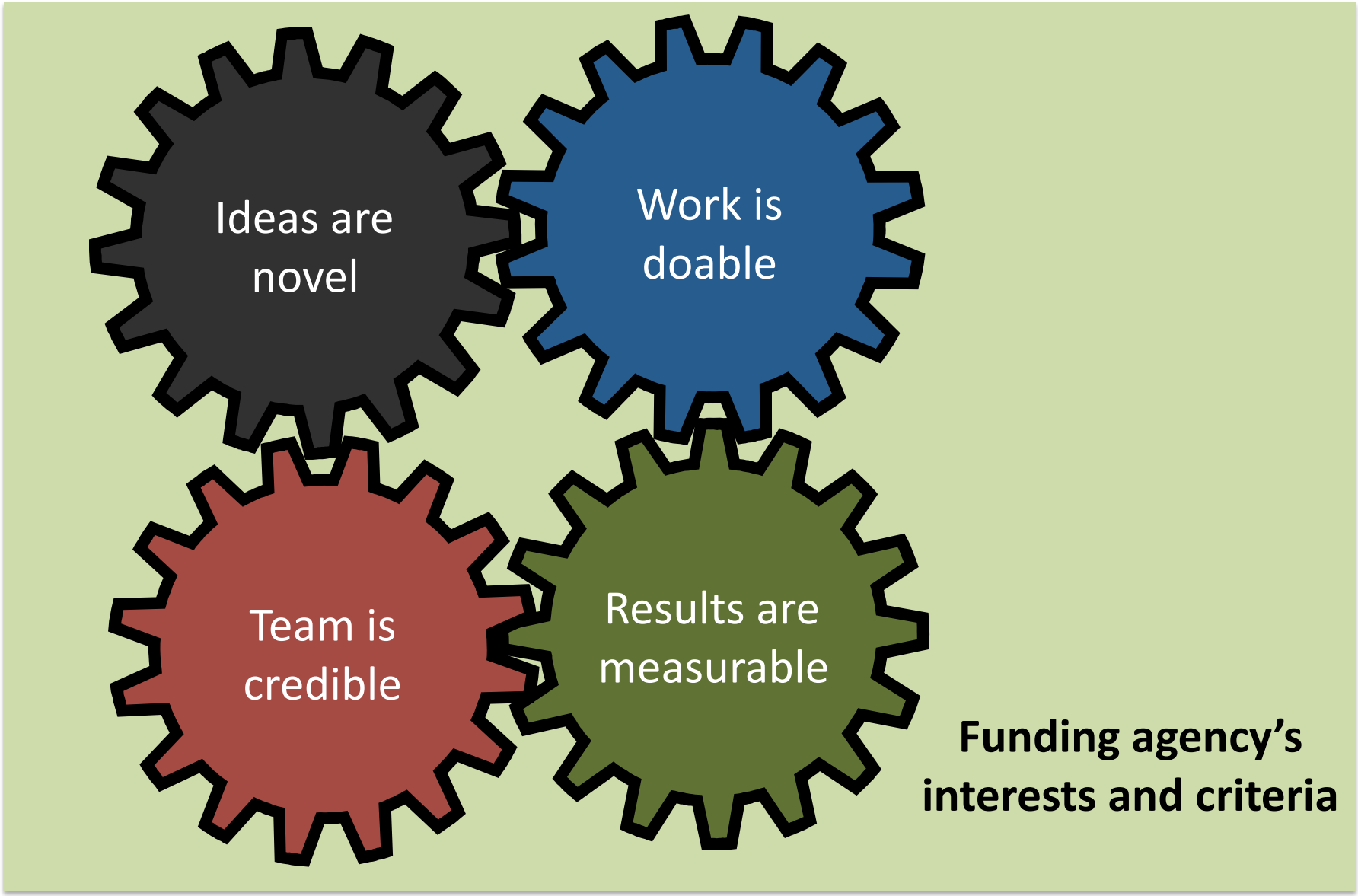
- SCRI represents a sea change: provides resources to develop a critical mass
- Opportunity to “raise all ships”:
  - Improve quality of life for agricultural workers
  - Keep the US agriculture competitive
  - Resurrect Agricultural Engineering as a discipline
  - Fuel a market for high tech Agricultural tools
  - Lower environmental footprint
- Payback for investing in a non-traditional organization

Act I:
Finding a fit with SCRI

Make up of ANY successful proposal



Make up of ANY successful proposal



Examples of agencies' interests and criteria

- NSF
  - Intellectual merit
  - Social impact
  - Not big on systems
- DARPA
  - Paradigm shifting technology
  - Military relevance
  - Not big on social impact
- NASA
  - Technologies for extreme environments
  - Space relevance
  - Dual use

- USDA SCRI
  - Multi-disciplinary
  - Multi-state
  - Cross-cutting
  - Has significant stakeholder involvement
  - Gets out in the world (e.g. via ag extension)
  - Good chance that the enterprise will grow after USDA funding ends

Act 2:
Writing a Winning Proposal

Challenge of large proposals

- Scope can be so wide that no single person is a expert in all of the topics, BUT
- Proposal needs to show an integrated approach, can't be piece meal
- WHOLE MUST BE GREATER THAN THE SUM OF THE PARTS

Developing a large SCRI proposal

- Develop good links with industry being served
  - Months/years before CFP is issued
- Jointly define problems to be solved and prioritize them
  - Start with open problems that the stakeholders want solved
  - Not what can be done with your favorite approach
- Identify core team
  - Go for the “dream” team, not your friends team
  - Best partners are complementary, not the people who do more of what you do
  - Include plant scientists, engineers, extension personnel and companies
  - Recruit secondary players only as needed
  - Recruit strong advisory panel
- Identify thematic areas and themes
  - Each theme should have a clearly identified leader

Developing a large SCRI proposal (cont.)

- Find matching funds
  - Growers, industry consortia and equipment manufacturers
  - Make sure to verify match eligibility with USDA, especially for equipment
  - Match commitments must be firm
  - Always "overmatch" as some items may not be accepted at award time
- Develop storyboards for each theme
  - Circulated and revised frequently among/by team members
  - Don't write any text before storyboard is complete
- Core team produces proposals and carries it to finish line

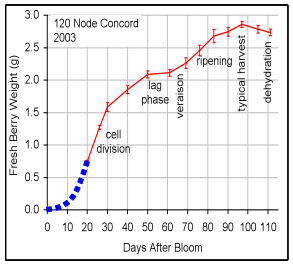
Storyboard structure

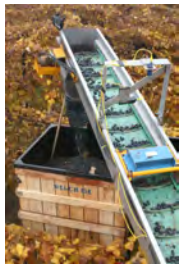
- Problem
  - Must be agnostic to solution
  - No jargon—something a grower would say
- Benefits
  - For the grower (improved quality, increased yield, reduced labor, lower environmental footprint, etc.)
- Approach
  - Key ideas: stress novelty of ideas
  - Rationale: Why the ideas are worth considering
- Team Expertise
  - List partners, especially outreach and commercialization
- Schedule over four years
  - Activities, milestones, success criteria
  - This turns into Statement of Work
- Each storyboard has compelling graphics

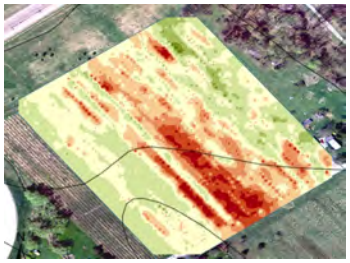
A picture is worth a thousand words!

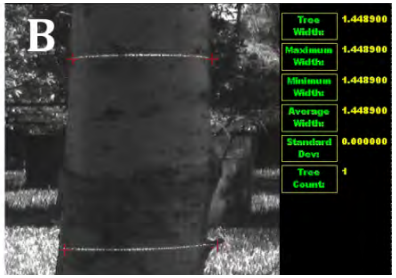
occluded fruit

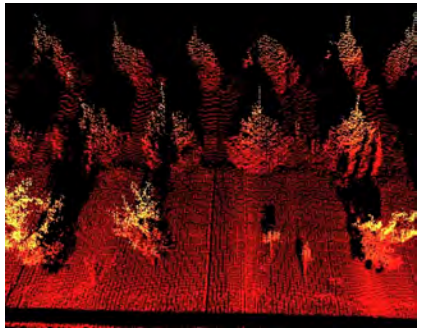
exposed fruit

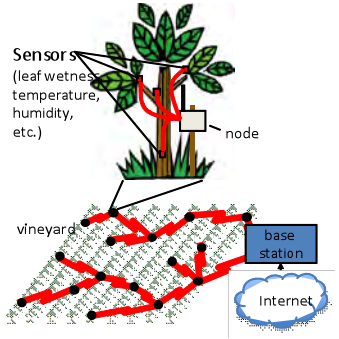


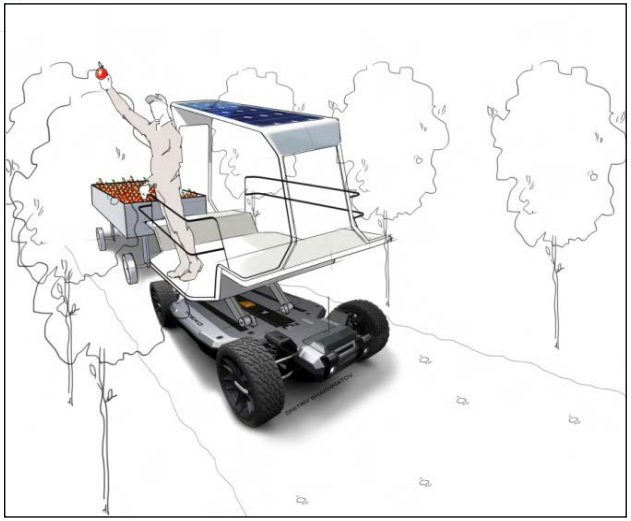












People involved

- Project director
  - Sets overall strategy, parallelizes tasks
  - Selects collaborators and negotiates their budget allocation
  - Sets proposal outline and page budgets
  - Has final word on conflicts
- Proposal manager
  - Integrates contributions from team
  - Makes sure all requirements from solicitation are met
- Review (“red”) team
  - Not the researchers who write the proposal
  - Performed sufficiently early so comments can be incorporated
- Get university behind project
  - Will need to sign off on match
  - Will need to cooperate on submission

How CASC was put together

- Started discussions with Penn State/apple growers 9 months before proposal deadline
- Identified movers and shakers in the industry, attracted them
- Started and stayed with a single project lead
- Created an outline of the proposal
- Refused to accept text already written
  - No writing until outline accepted
- Each leader required to articulate (max. three slides)
  - Problem: agnostic to solution (e.g. need to count fruit)
  - Approach: how the problem is solved (e.g. use computer vision)
  - Milestones: concrete results (e.g. build a mobile sensor)
  - Criteria for success: quantitative (e.g. count 95% of visible fruit)

How CASC was put together (cont.)

- Once picture clear, leaders wrote in a structured way with fixed page limits
- Core group of people wrote front end and back end
- Conducted “Red Team” review by others who have written large proposals and run large projects
- Sections turned into statements of work for subcontractors
- Got much help from budget offices at PSU, OSU and WSU

Act 3:
Managing the Project

Typical Elements of a Large SCRI Project

- Participants have different cultures
  - Work moves at a different pace at each institution
  - Motivation/criteria for success varies
  - Integration between groups is difficult
- Many threads
  - Not all will be successful
- No one person understands all technical details
- Reporting structure is distributed
- Validation comes from a combination of third parties

CASC model

- A federation of research groups
  - Manage results, not methods
- Clear definition of yearly and interim goals
  - Year 1: straight from proposal
  - Years 2-4: small reassessments based on prior year's findings
- Regular progress assessment
  - Progress report meetings alternate with showcase meetings
  - Two interim reports per year
  - Annual report -- Not a collation of interim reports
  - Annual *in loco* visit to all groups
- Clear integration path
  - Semi-annual and yearly field experiments
- Budget for subgroups reviewed yearly
- Cut efforts that fail even after a lot of feedback
- Look to extension studies and industry consortia to validate problems and success

Yearly and interim goals

- Ideally, already in the proposal
- Goals must be
  - relevant (to the client!)
  - challenging
  - realistic/achievable
- Goals must include at a minimum
  - activities (verb)
    - develop system, execute field test, test algorithm, etc.
  - deliverable (substantive)
    - software, hardware, field test, database, report, etc.
  - success criteria (numeral)
    - quantitative measure of success

Example: Reconfigurable Mobility

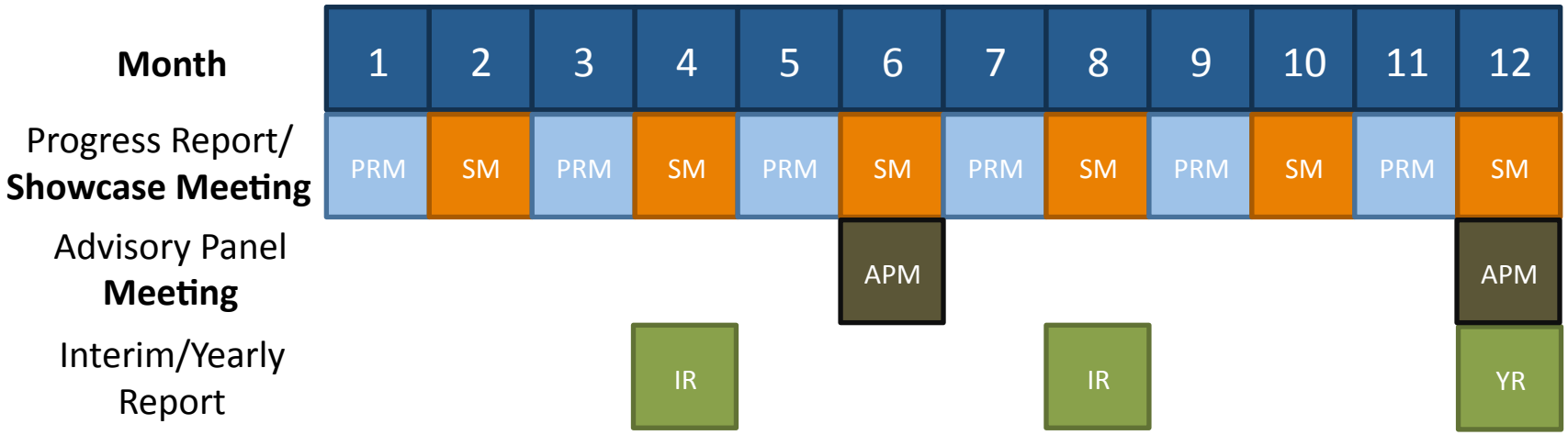
Year 2 goals

Activities	Deliverables	Success Criteria
1. Integrate payload for assessment and treatment tasks. 2. Integrate low-cost localization. 3. Perform field tests in WA and OR. 4. Extend APM automation to one more platform.	1. APM integrated with GIS and crop load assessment. 2. APM integrated with precision spraying. 3. APM automation package installed and tested on N. Blosi platform.	1. 100 km low-cost APM scout safe operation with a MDBF of 10 km. 2. 10 km of autonomous row following with the N. Blosi platform.

Year 1 goals by quarter

Quarter	Goals	Deliverable
1	1. Demonstrate autonomous mobility in orchard (1 km) using existing APM	1. Demonstration
2	1. Complete design of first APM; test components individually 2. Demonstrate simulated driving between rows of trees based on laser data collected in Y1Q1	1. Design document, test report 2. Demonstration
3	1. Execute 1 km continuous run row following experiment in orchard 2. Execute 10 km continuous run row following experiment in orchard 3. Map APM's design onto orchard platform	1. Demonstration 2. Demonstration 3. Design document
4	1. Develop orchard-specific row guidance and safety using precision GPS 2. Deploy of 3 different payloads from APM 3. Port APM design to different platform	1. Demonstration 2. Demonstration 3. Demonstration

Meeting and reporting schedule



Roles of the PD and PM

- Project Director
  - Set the pace of the project
  - Establish goals
  - Negotiate subcontracts
  - Control budget (macro)
  - Communicate with stakeholders
  - Make final decisions on project-related matters including cutting themes

why
what

- Project manager
  - Ensure SOW is being pursued and goals are being met
  - Prepare and issue reports
  - Organize and run meetings
  - Issue and oversee subcontracts
  - Control budget (micro)
  - Consult with USDA on project-related matters

how
when
where
whom

cascrop.com

- Knowledge repository
  - Field trip reports
  - Papers, articles, posters
  - Press reports/press releases
  - Announcements, calendar
  - Team and advisory panel contact info
- Base technology: Joomla

cascrop.com


CASC
Comprehensive Automation for Specialty Crops
Ajax Search...
Home
site frontpage
The Project
details and updates
The Team
science and industry
Publications
choose by type
In the News
featured articles
What's New
recent updates
Partnerships
our collaboration
Show Pictures
Reconfigurable Mobility
The APM
Announcements
Interpoma
November 4-6, 2010
Bolzano, Italy
Orchard tours
November 7-9, 2010
Italy
EIMA
November 10-14, 2010
Bologna, Italy
Last Updated
09.14.10
Comprehensive Automation for Specialty Crops (CASC) is a matching grant program funded by the USDA-SCRI and industry to develop comprehensive automation strategies and technologies for the specialty crop industry, with an initial focus on apples and nursery trees. We are a multi-disciplinary, multi-institutional group comprised of engineers, scientists, extension educators, growers, and industry representatives in universities, government labs, and companies spanning five states, representing some 70% of all US apple production.
Read more...

Feedback at end of Year 1

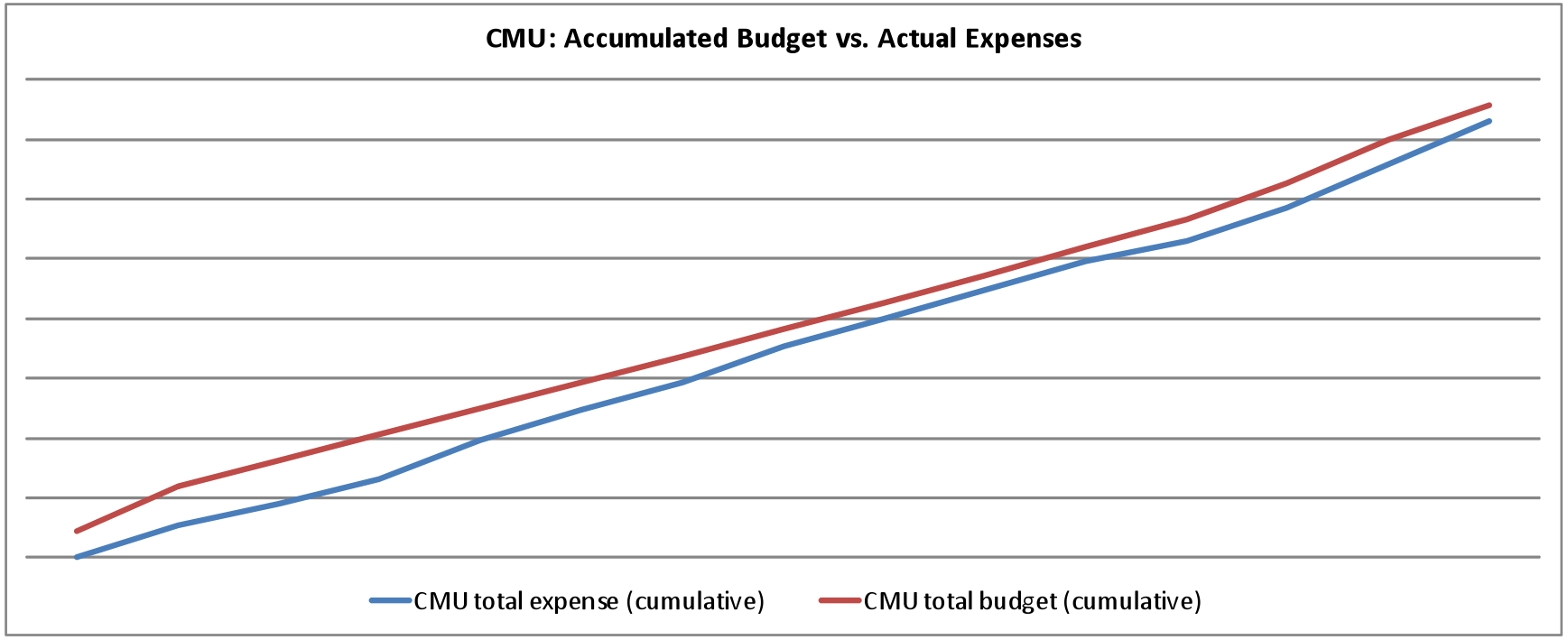
- GOOD
  - Delineated tasks
  - Participation of advisory panel
  - Team of very competent senior scientists and engineers
  - Collaborators very enthusiastic, especially the extension people
  - Field testing, especially two weeks in field in WA
  - Emails are keeping advisory panel engaged
  - Project is lots of fun for many of us
  - Undergrads and lay people love to hear about this project
  - Having a project manager

- NOT AS GOOD
  - No open discussion at meetings due to presence of stakeholders
  - Not enough time for consideration or discussion of showcase
  - Depth of communication and understanding is not as good as it could be
  - Meeting structure/frequency could be improved
  - Reporting structure/frequency could be improved
  - For economists and biologists, not much may happen month to month
  - Apparent expectations of monthly reporting are inappropriate
  - Culture of project is quite different from what some team members are used too

Challenges

- Maintain communication among all groups
- Dealing with an underperforming partner
- Share data outside project
- Engineering vs. plant science culture
- Controlling budget and matching

Budget control



Staying successful

- Motto: “Keep the program sold”
  - Funding is not an entitlement
  - Make your client look good
  - Provide continuous, easy to explain, reliable evidence that you are succeeding
- Who is the client?
  - Industry associations
  - Growers
  - USDA program manager

Summary: Winning

- Start discussions with industry early
- Land usage has great match potential, but cash contributions are the way to tell if the industry is really serious
- Outline! Don't write until content is clear
- Set metrics (criteria for success) to clarify that your project will be beneficial
- Proposal should read like it was written by a single entity
- Get industry leaders on your advisory panel
- Perform a "Red Team" review of your proposal by people not involved in writing

Summary: Managing

- Get experienced people to manage proposal and run project
  - Distinct need for a Proposal/Project Manager at 50% effort for a CAP
- Set/review goals for each team every year. Be clear on criteria for success. Use this for setting Statement of Work for each institution.
- Make expectations (reports, meetings, field trips) explicit
- Cut themes that are not working
- Keep program "sold": Involve advisory board and program manager continuously

Thank you.

ssingh@cmu.edu

marcel@cmu.edu

National Institute of Food and Agriculture
www.nifa.usda.gov

Why, How, Who, and What NIFA and Outcomes

Bob MacDonald

Director

Office of Planning and Accountability

September 29, 2010

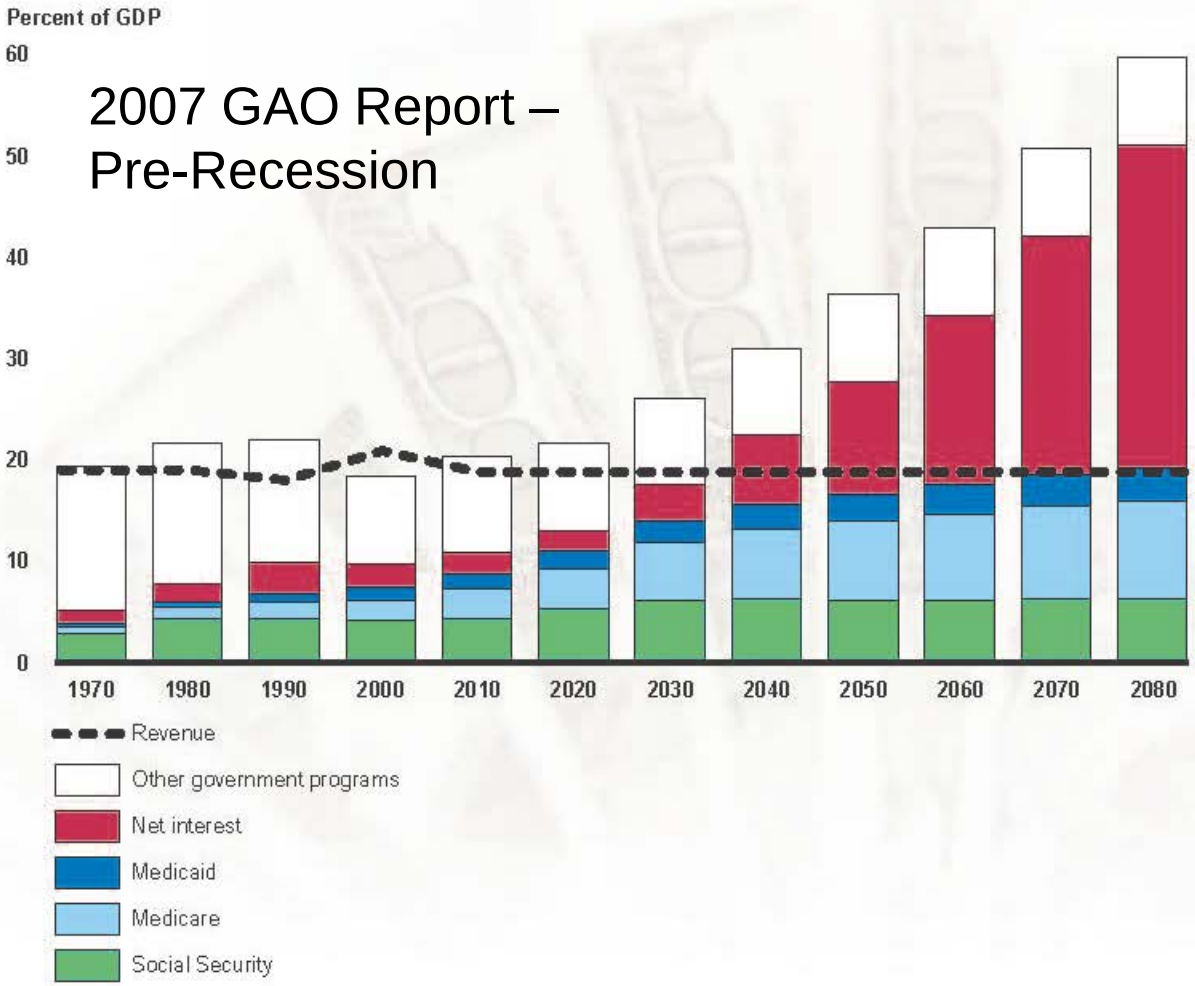
Topics

- Federal Budget Situation – **Why** your reports are important
- **How** NIFA uses your reported outcomes and to **who**m we send them
- Examples of **what** NIFA sends forward
- Advertisement – Building Consensus on National Outcomes and Indicators Workshop

National Institute of Food and Agriculture
www.nifa.usda.gov

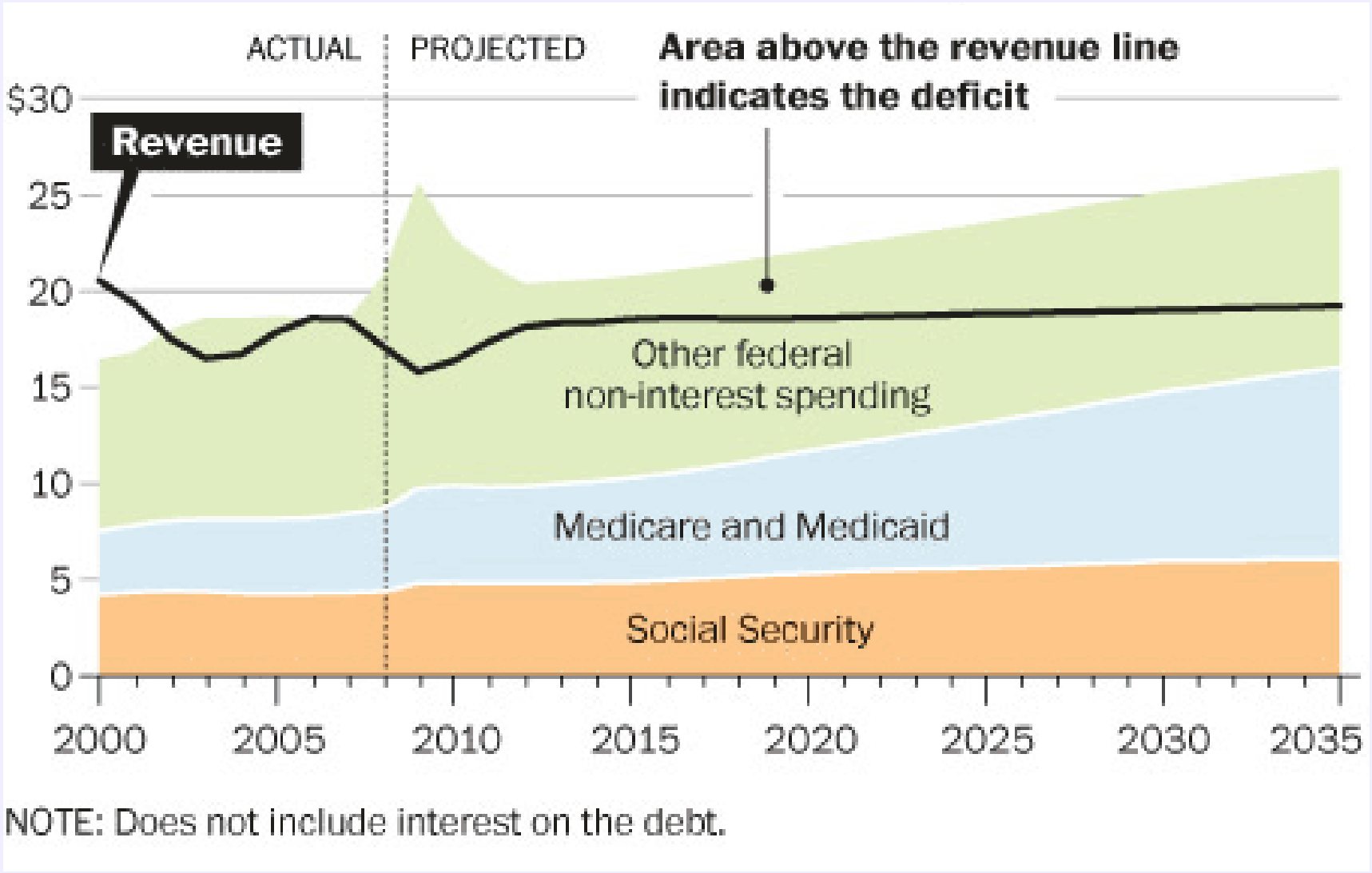
Federal Budget Situation

Why your reports are important

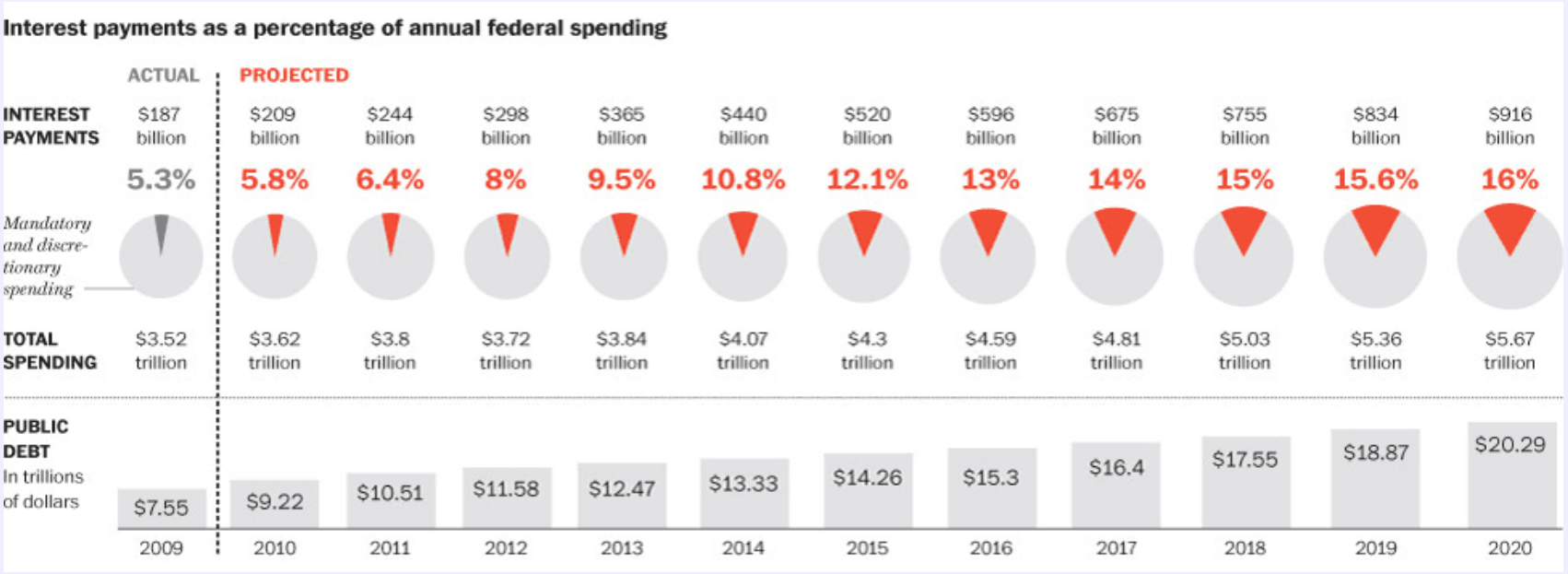


2007 GAO Report – Pre-Recession

Source: Government Accountability Office



Source: Congressional Budget Office as published in The Washington Post 4/27/2010



Source: Congressional Budget Office as published in The Washington Post 4/27/2010

USDA National Institute of Food and Agriculture
www.nifa.usda.gov

How NIFA uses your reported outcomes and to whom we send them

How NIFA uses reported outcomes

- Budget
  - Secretary (Agency Estimates – June)
  - White House (Department Estimates – September)
  - Congress (President's Budget – February)

How NIFA uses reported outcomes

- Budget
  - Past performance by goal and objective
  - Proposed increases
    - Past performance (if existing budget line)
    - Future expected results if receive proposed increase

How NIFA uses reported outcomes

- USDA Performance Annual Report
  - Examples of Research, Education, and Extension have high visibility
- Portfolio planning and assessment
  - NIFA and OMB

Examples

(Quality and quantity of outcomes in Annual Reports has really improved)

What is needed to convince a decision-maker?

- Concise and comprehensible
- Context and interpretation
- Public, National value

Farmers Grow Higher Revenue Generating Crops – With NIFA funding scientists in North Dakota developed three barley cultivars which are recommended for malting and brewing by the American Malting Barley Association. The two-rowed malting barley cultivar Conlon was grown on 18% of the North Dakota barley acreage or 265,000 acres. Since Conlon is a malting barley, it commanded on average a $1.25 premium over feed barley. In 2009, this resulted in Conlon generating an additional $23 million in revenue for North Dakota growers that grew this cultivar.

More Efficient Bio-refineries - Improved conversion of lignocellulosic biomass into biofuels is a high priority national research goal that will enhance national security, balance of trade, rural employment opportunities, and the nation's environmental performance, including net reductions in CO_2 emissions. NIFA funded scientists in Georgia developed a new chemical reaction that converts waste biomass lignin into high-value chemical components that will make bio-refineries more efficient and effective. This new reaction will yield high-value, renewable, chemical components derived from lignin. The new products can be used in a variety of products that are currently dependent on petroleum-based resources, as well as improve modern ethanol conversion programs.

Improving Efficiency in Pork Production – Pork producers who formulate diets on a digestibility basis, maximize their use of synthetic amino acids, and make use of alternative ingredients can reduce total feed costs by more than $20 per ton in some cases at an average savings per ration of $12 per ton. This information was provided by NIFA funded University of Missouri to more than165 Missouri pork producers who raise more than 80 percent of the pork in Missouri. The feed savings generated by reformulating diets resulted in an average of $5.50 per pig marketed. Therefore, a Missouri pork producer who finishes 6,000 head of pigs had a $30,000 savings in feed costs. For Missouri, the economic impact for pork producers is over $14.8 million savings in feed costs.

Electrical Energy Production from Natural Plant Processes – A NIFA funded researcher at Vanderbilt University and his colleagues have successfully converted solar energy to electricity using a photosynthesis protein unit. The conversion efficiency has been improved more than four orders of magnitudes over the course of three years of the research. The prototype can produce electricity voltage similar to an AA battery. More impressively, the prototype unit has been continuously working for more than 300 days and still counting. This also offers a new value added uses of the by-products of agricultural crops.

Research Aims to Improve Child Nutrition – About 12% of the U.S. population do not consume enough zinc in their diets and are at risk for marginal zinc deficiency. NIFA funded researchers at Oregon State University found that rats fed even marginally zinc-deficient diets had more DNA damage, increased levels of oxidative stress and decreased ability to repair DNA compared to control animals fed diets containing adequate levels of zinc. Impairment of DNA integrity can adversely impact immune function and increase risk for cancer. This study has important implications for child nutrition because infants and children are more likely to suffer from marginal zinc deficiency than adults.

Fighting Food Pathogens at the Source – Although cattle are important reservoirs of foodborne pathogens, no validated method exists to monitor them on farms. The goal of this project was to improve food safety by developing efficient, effective methods to determine the E. coli O157:H7 and Salmonella status of pens of feedlot cattle and to reduce the potential that these foodborne pathogens are transmitted outside the feedlot. NIFA funded scientists in Nebraska developed and validated a pen-testing protocol as a monitoring tool for feedlot production HACCP programs and as a research tool to identify and test potential HACCP control points. This work was important to the understanding of when and where food safety pathogens occur in cattle feedlots and enable the development of control strategies.

Building Consensus on National Outcomes and Indicators Workshop

- Purpose - To develop one or two regional/national outcomes and indicators for each of the five NIFA priorities
- Scheduled for February 21 - 24, 2011 in New Orleans at the Wyndham Riverfront Hotel

Workshop Participants

- 55 Land-Grant Participants needed
  - 25 Research, 25 Extension
    - One Research, One Extension from each Region on each of the Five NIFA Priority Area Teams
    - Directors/Associate/Assistant Directors
    - State Program Leaders
  - Five Evaluation Specialists (one on each team)
- Five Facilitators (One for each team)
- Ten NPLs – NIFA (2 per Team)
- Two Office of Planning and Accountability Staff

Documenting Impacts How & Why

Bill Brown

UT AgResearch

Institute of Agriculture

University of Tennessee

UT AgResearch

Documenting Impacts
Why

- ✓ Demonstrate the value of our programs
  - ✓ Clientele
  - ✓ Public
  - ✓ Legislature & decision makers
  - ✓ Development
  - ✓ Peers
  - ✓ Internal faculty & staff

- ✓ Lack of public awareness of our programs and activities

- ✓ Show the high quality of our science

UT AgResearch

Documenting Impacts
Why

- ✓ Generate support for our programs
  - ✓ Clientele
  - ✓ Public
  - ✓ Legislature & decision makers
  - ✓ Development

- ✓ Mandatory items in state & federal budgets comprise greater percentages of revenue

**** * Multiple uses of information * ****

UT AgResearch

Documenting Impacts
How

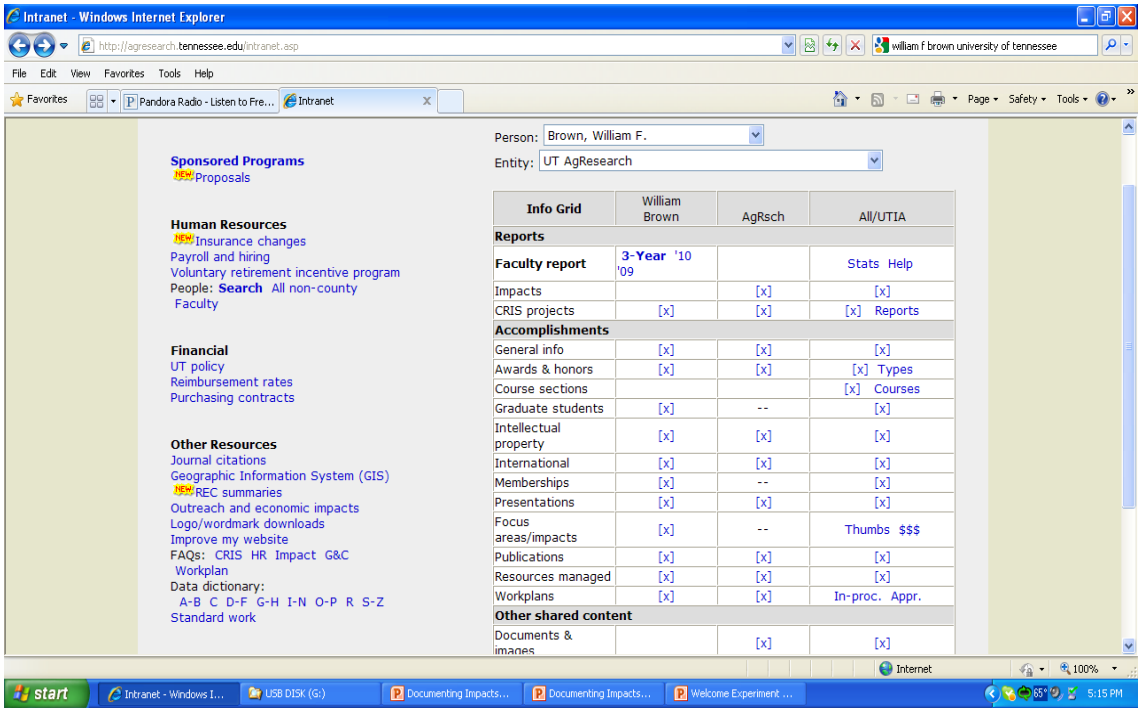
- ✓ Commitment to reporting
- ✓ Know your programs
  - ✓ Short and long term
  - ✓ It is not about yearly reporting

- ✓ Strong linkage between teaching, research & extension
- ✓ Strong linkage with Marketing & Communications
- ✓ Always on the lookout for stories

UT AgResearch

Documenting Impacts
How

- ✓ ***Commitment to reporting***
  - ✓ Online faculty annual report

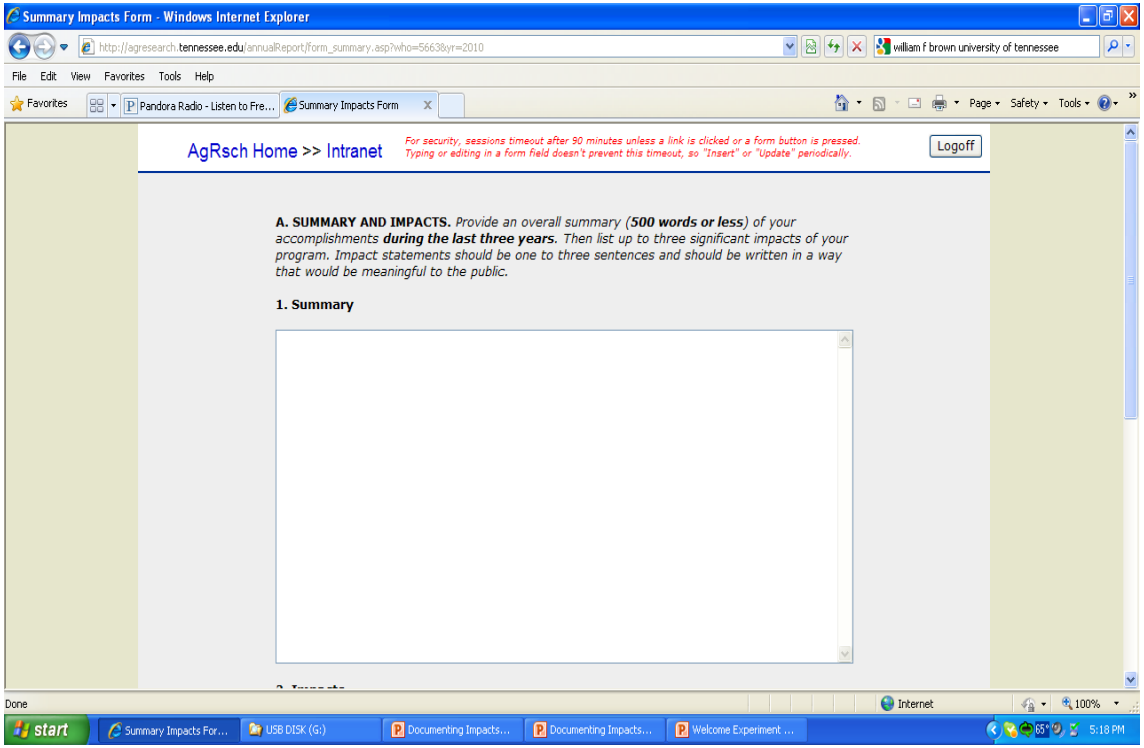


Joel Lown

AgResearch

Documenting Impacts
How

- ✓ ***Commitment to reporting***
  - ✓ Extensive editing of AD-421



Joel Lown

AgResearch

Documenting Impacts
How

- ✓ ***Strong linkage between teaching, research & extension***
  - ✓ Extension has online reporting for agents
  - ✓ Joint submission of “Plan of Work”
  - ✓ Major emphasis on Field Days

- ✓ “Traditional clientele”
- ✓ “Non-traditional clientele”

AgResearch

Documenting Impacts
How

- ✓ Milan No-Till Field Day

  3,000 to 4,000 attendance

VIP Breakfast

AgResearch

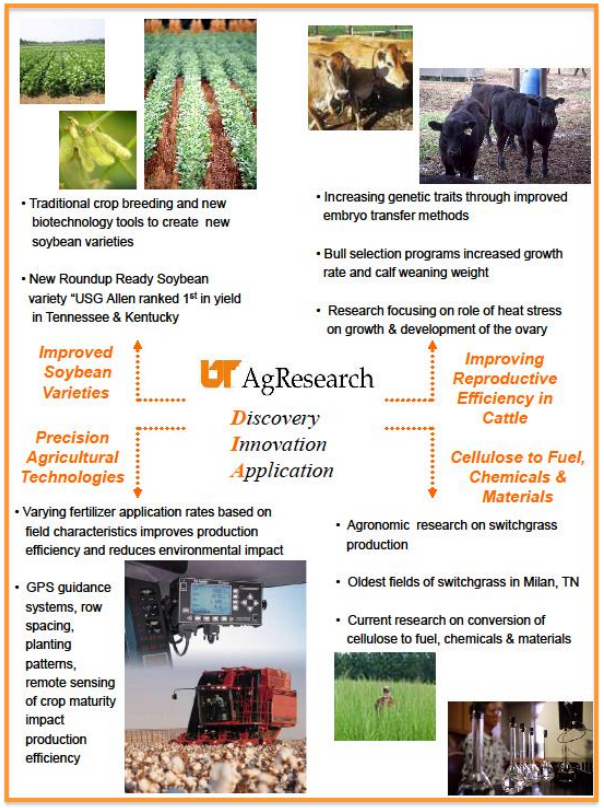
Documenting Impacts
How

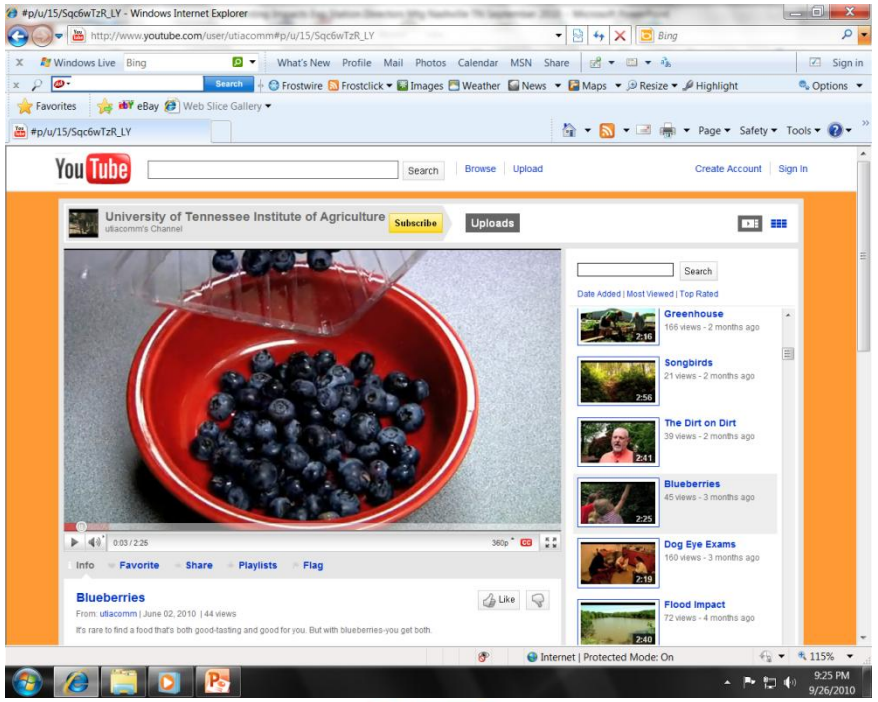
✓Summer Celebration – Jackson REC

✓3,000 to 4,000 attendance

Documenting Impacts
How

✓ ***Strong linkage with Marketing & Communications***





AgResearch

Documenting Impacts
How

- ✓ ***Always on the lookout for stories***
  - ✓ Near-term or future impact of research
    "This research is designed to . . . . . "
    Some can be developed in one year

Documenting Impacts
How

- ✓ ***Always on the lookout for stories***
  - ✓ Most complete stories take many years to develop

TN Soybean Breeding and Agronomic Variety Testing Program

Late 1980's – crossing for what was to become USG 5601T
USG 5601T (conventional soybean) – released in 1996
Allen soybean (roundup gene in USG 5601T) – released in 2006
Significant planting of late maturity soybeans in 2009