Food, Fuel, Fiber, and Health Initiative

The Role of the 229 Agency

Virginia Agricultural Experiment Station (VAES)
and
Virginia Cooperative Extension Service (VCES)

Virginia Tech

229 AGENCY

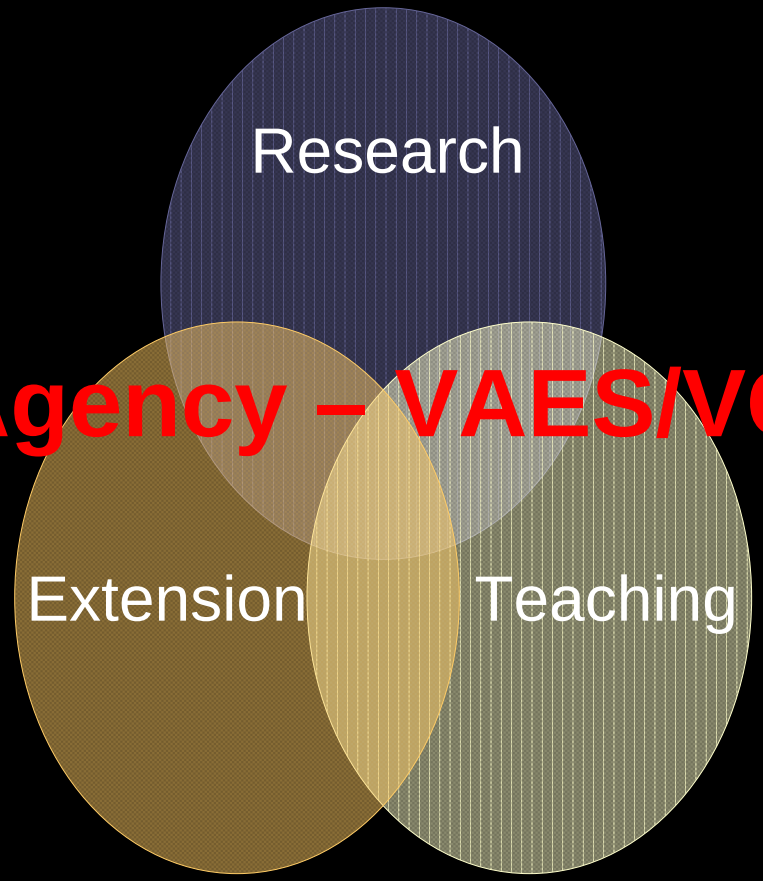
Virginia Agricultural Experiment Station (VAES)
Virginia Cooperative Extension Service (VCES)

An agency of the land-grant university system that **develops and delivers** research-based technology, educational programs, and services not provided by any other state agencies.

This agency and its programs helps Virginia to create high quality jobs and economic vitality, while enhancing environmental quality and animal and human health.

A Vision Building On Our Roots with Innovation, Quality, and Results

Agriculture and Life Sciences



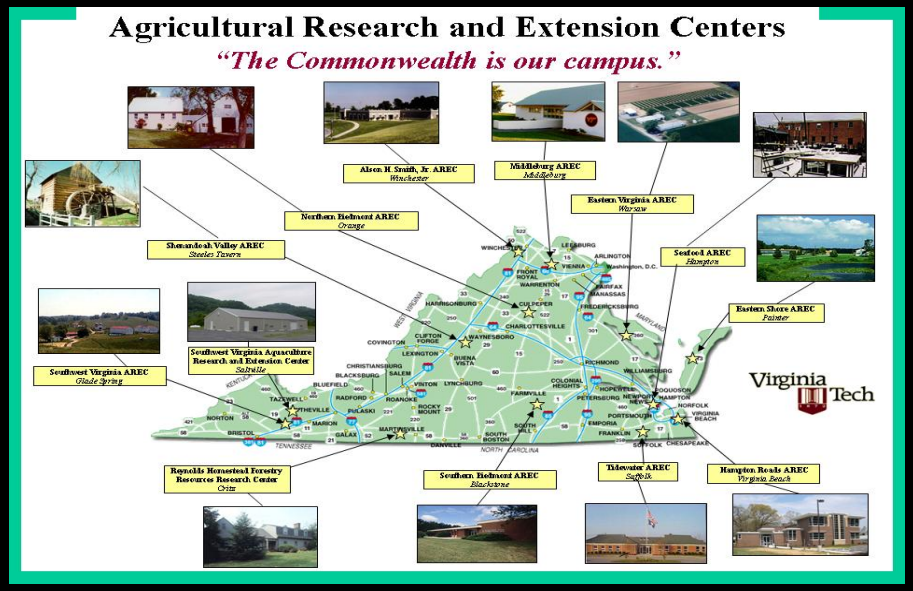
229 Agency – VAES/VCES

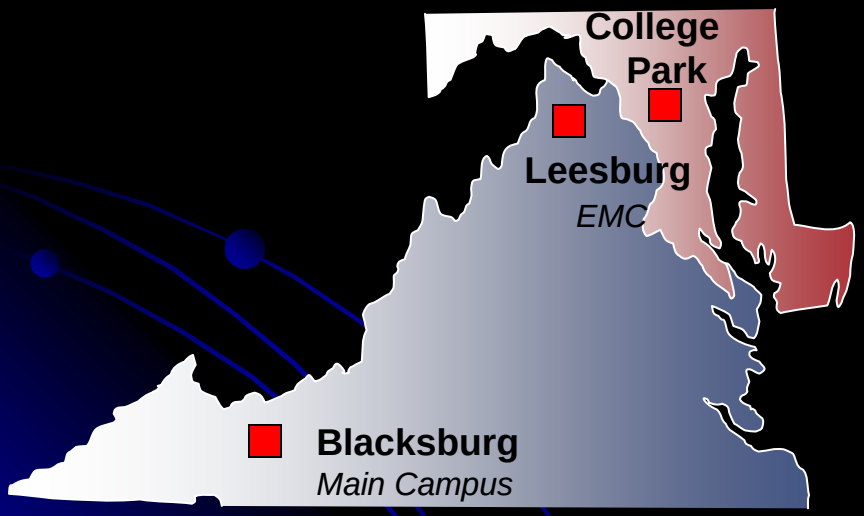
Veterinary Medicine

Natural Resources

229 AGENCY COLLEGE NETWORK

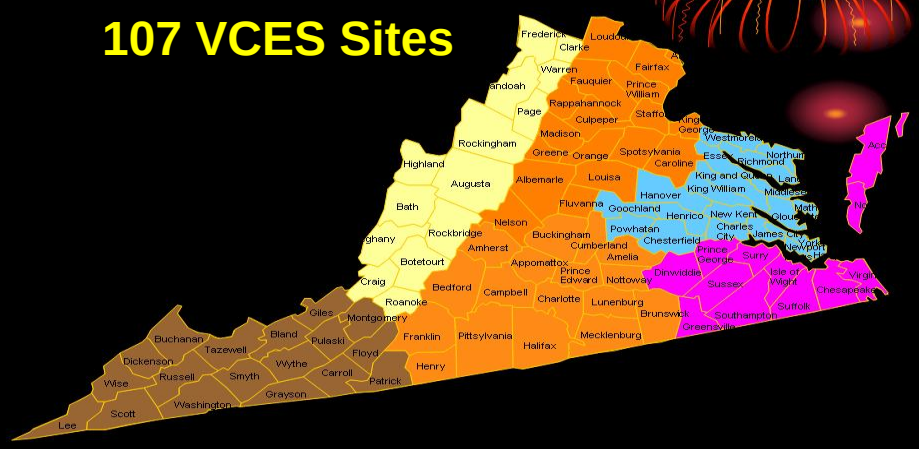
- **VT Campus (3 colleges)**
- **AREC's (13)**
- **Vet Medicine (3 Facilities)**
  Instruction/ Hospitals/ Research
- **Extension**



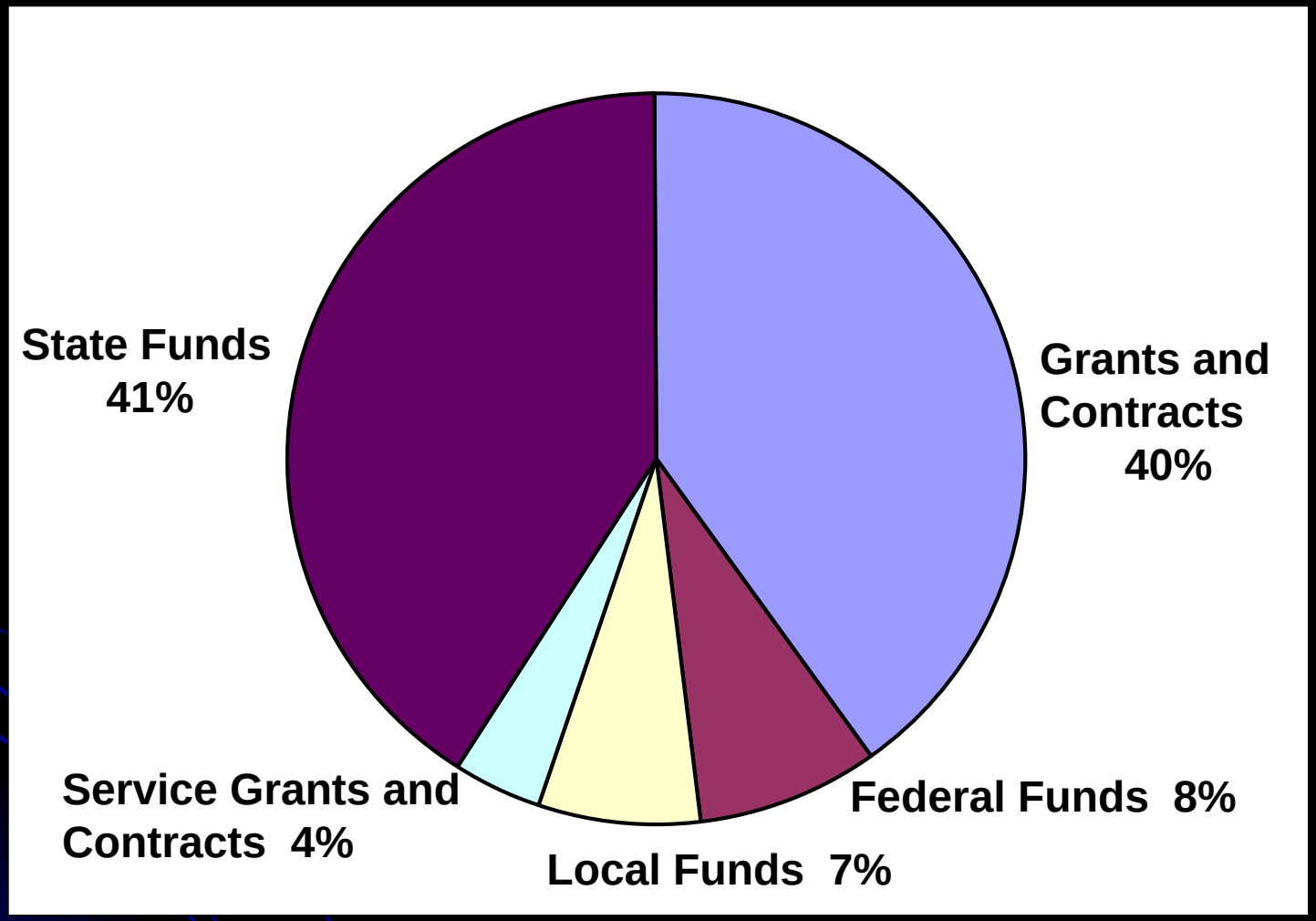


Extension Districts (6)

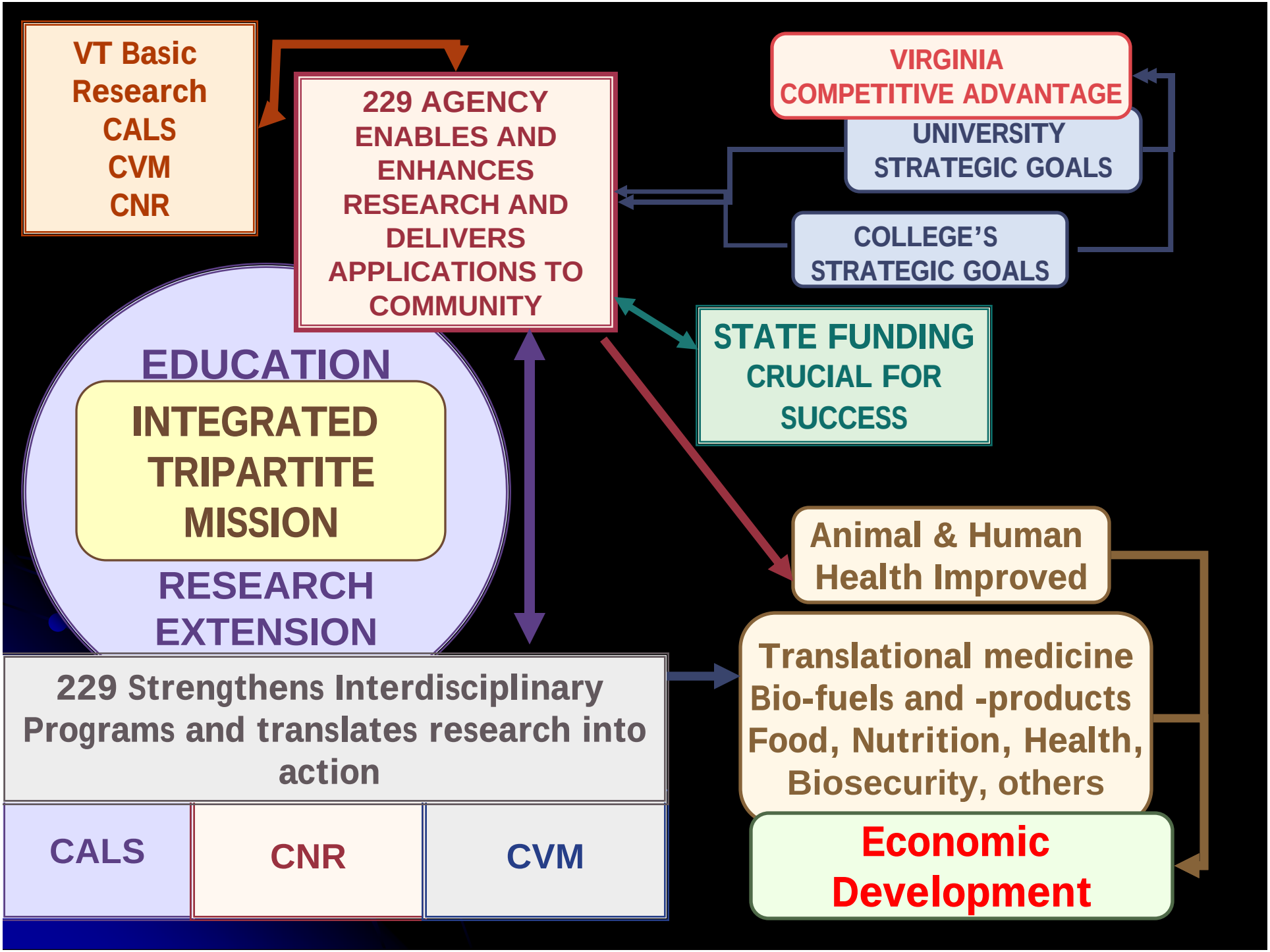
107 VCES Sites



229 Agency Funding Sources



The 229 Agency generated $99.6 million for the $69 million invested by the Commonwealth. $1 to $1.45 return.


VT Basic Research
CALS
CVM
CNR
229 AGENCY ENABLES AND ENHANCES RESEARCH AND DELIVERS APPLICATIONS TO COMMUNITY
VIRGINIA COMPETITIVE ADVANTAGE
UNIVERSITY STRATEGIC GOALS
COLLEGE'S STRATEGIC GOALS
STATE FUNDING CRUCIAL FOR SUCCESS
EDUCATION
INTEGRATED TRIPARTITE MISSION
RESEARCH
EXTENSION
Animal & Human Health Improved
Translational medicine
Bio-fuels and -products
Food, Nutrition, Health,
Biosecurity, others
Economic Development
229 Strengthens Interdisciplinary Programs and translates research into action
CALS
CNR
CVM

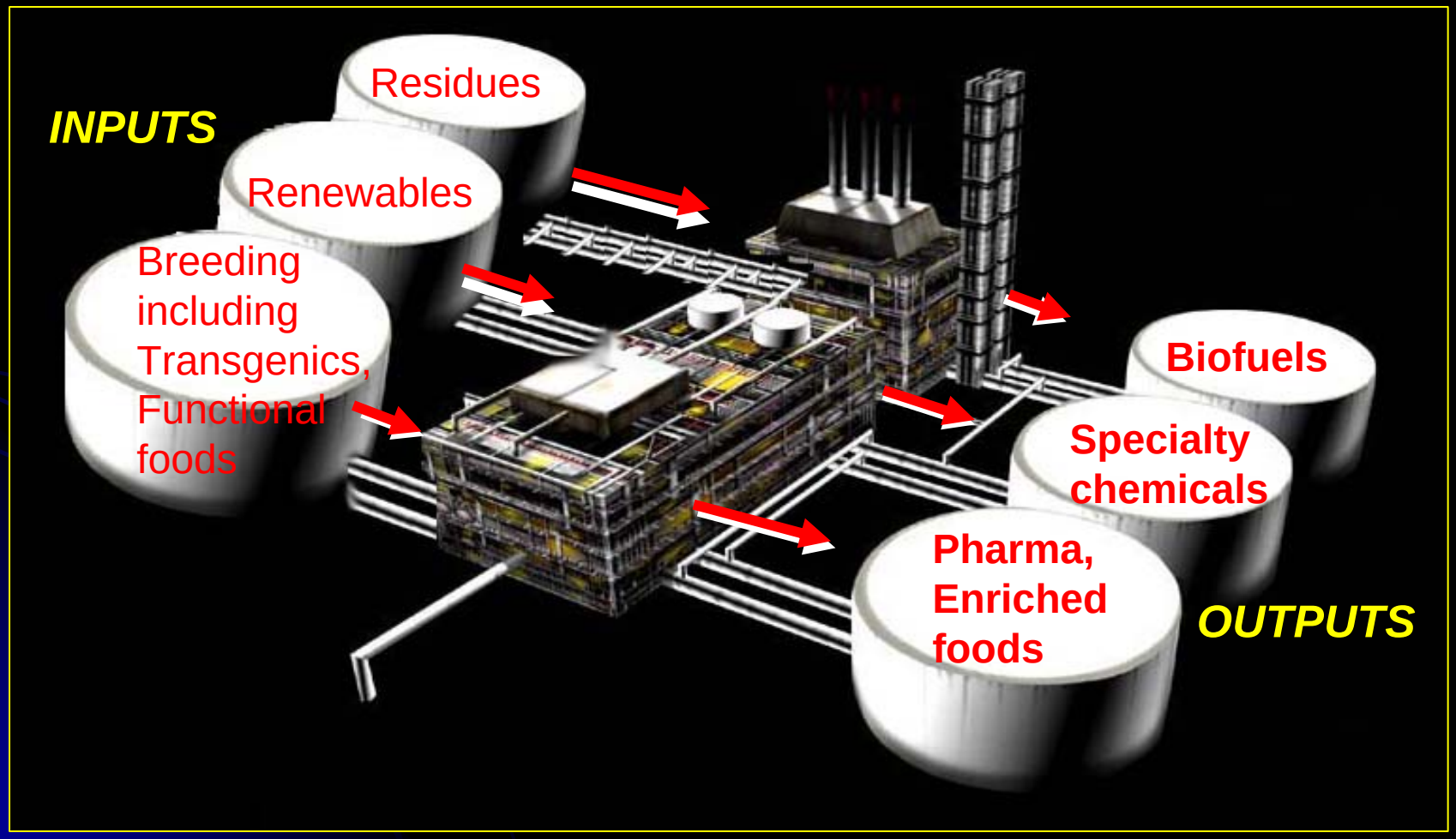

Virginia Tech
Institutes (IBPHS)
and Colleges
Communities, business
and consumers
Producers and
producer organizations
"CLUSTER HIRES"
Leveraging Resources
through Partnerships
Public and
private sector
organizations
Federal and state
governments
and agencies
Community Colleges
Virginia Universities
Carilion Medical System
Novozymes

“The New Frontiers”

- **Biobased products.**
- **Health and nutrition.**
- **Biosecurity.**
- **Translational medicine and research.**
- **Community economic viability.**
- **Environmental stewardship.**

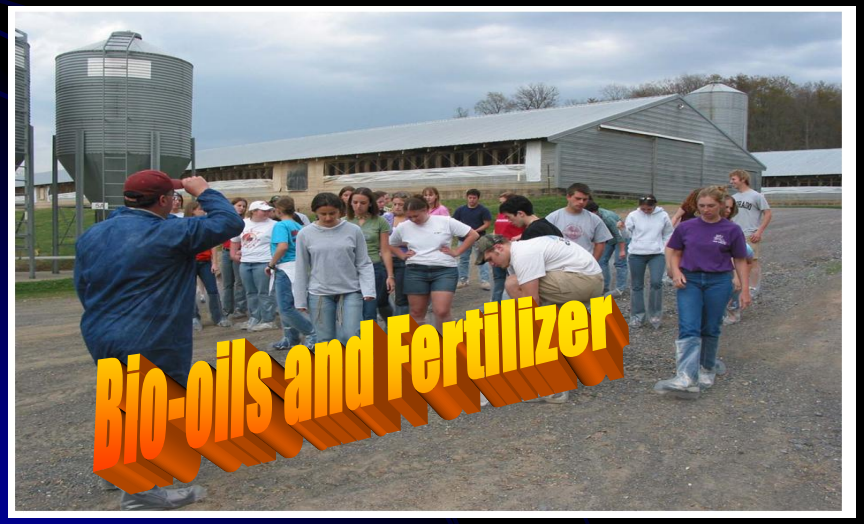
BIOPROSSESSING (Product Development) and BIODESIGN (Breeding)

"Biobased Products"

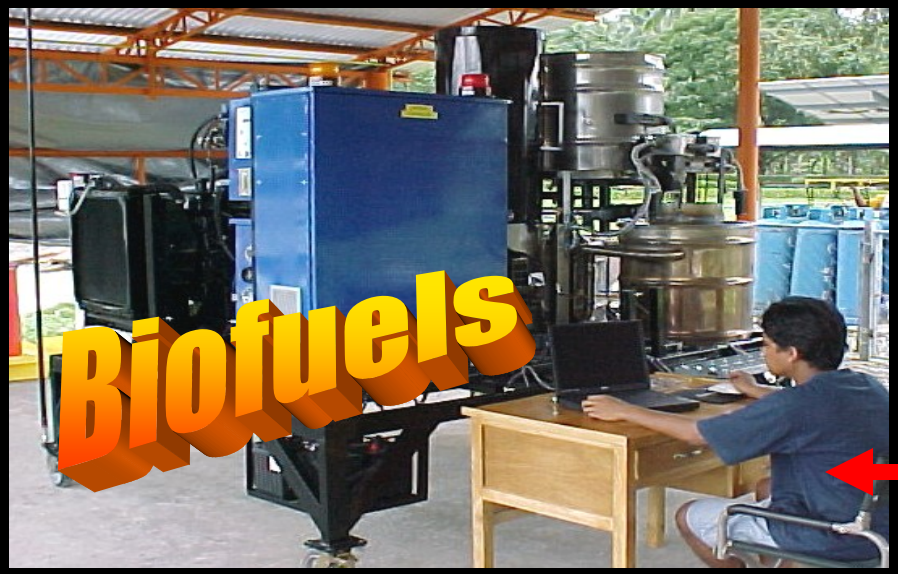


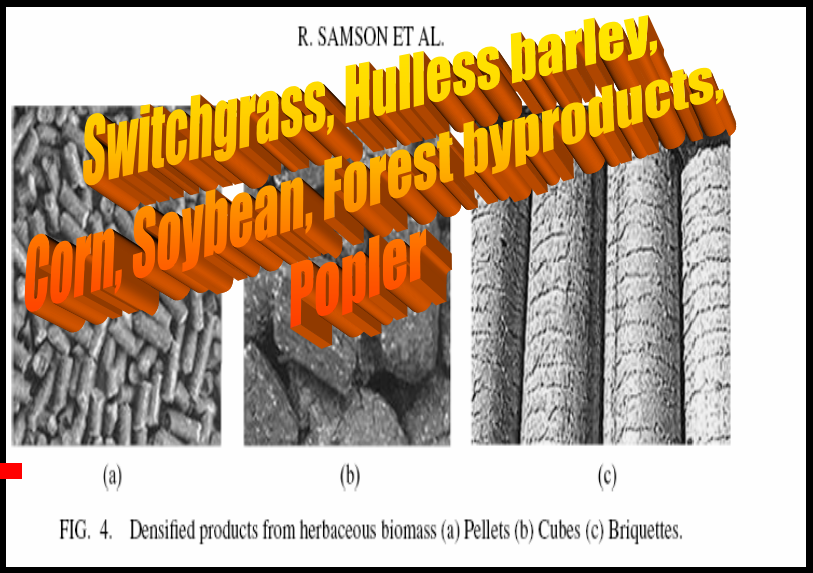

Plastic products - wood chips + waste plastic


Engineering soybeans for improved nutrient management
Virginia Tech
Goal: to alter P storage in seeds to improve nutrient availability and reduce environmental impact
Phytate
Transgenic soybeans expressing an enzyme that degrades phytate for improved P availability
FRALIN BIOTECHNOLOGY CENTER


Bio-oils and Fertilizer


Fertilizer



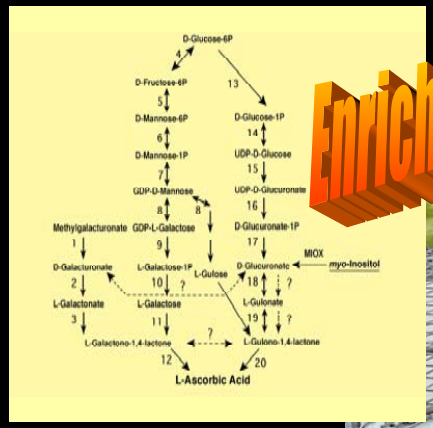


New Product:

WoodGro **(patent pending)**

Pine chips from ground loblolly pine logs (left) prior to grinding into a material suitable for a container substrate (right)

Breeding and Transgenics



HEALTH and NUTRITION
(Reducing Obesity/Diabetes/Chronic Diseases)

Plant/Animal Metabolic Engineering (Biodesign)

Foods with more antioxidants.

Grains (wheat)
Soy (isoflavones)
Vegetables (vitamin C)
Fish (Se, Omega 3 fatty acids)
Fruit (apples, grapes, strawberry)
Livestock (pasture and grain fed)

Biochemists

Evaluate properties and mechanisms of action of food chemicals.

Biologists/ Molecular Nutritionists

Determine mechanism of action within cell to reduce oxidative stress - genomics, signaling, modeling, etc.

Human/Animal Nutritionists

Examine how food/nutrients affect factors associated with obesity and diabetes, and physical activity.

Food Scientists

Analyze antioxidant content of food and determine how to supplement and preserve antioxidants during processing.

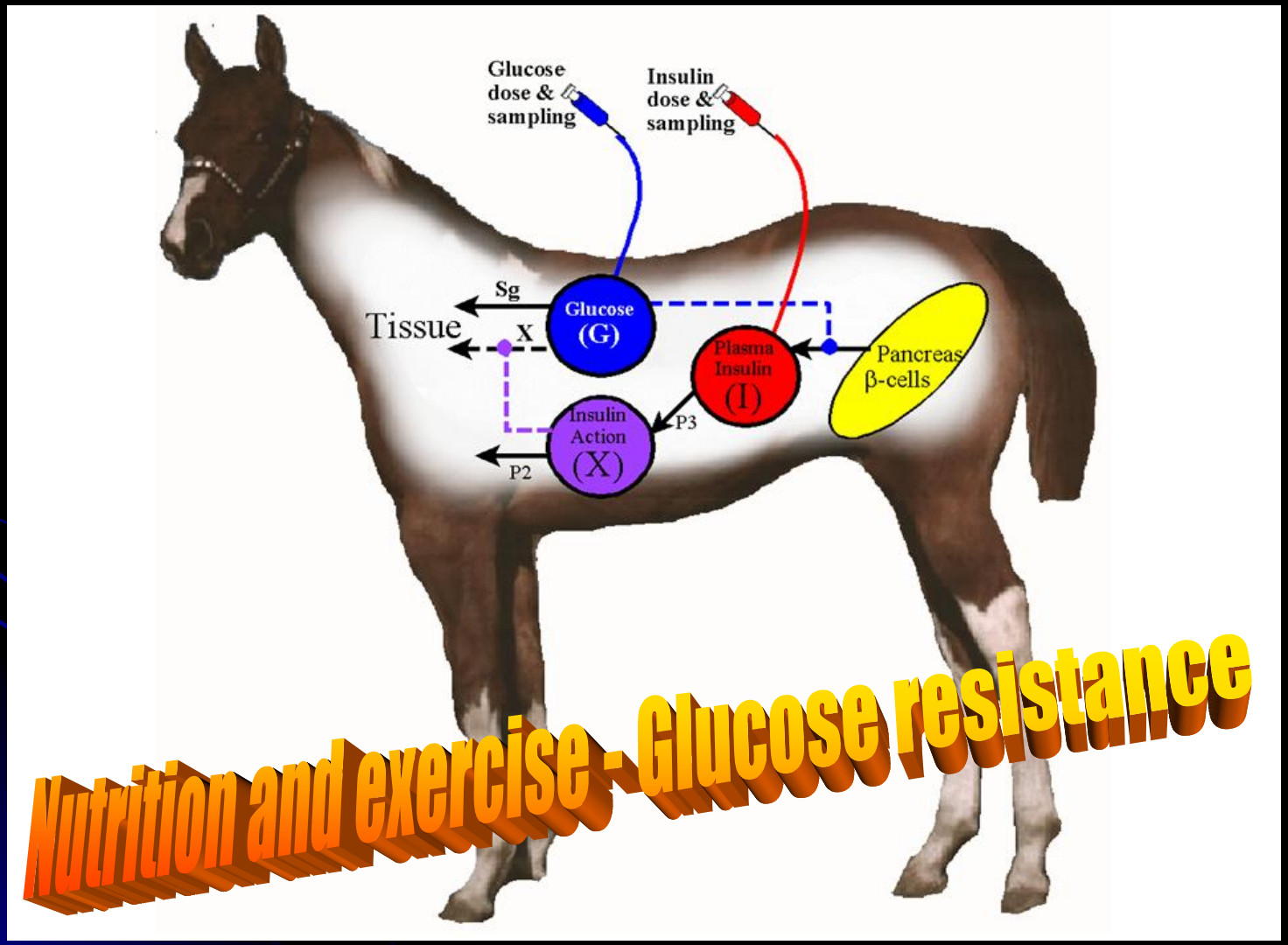
Economists, Policy Analysts Assess the impact of economic and policy issues on human consumption.

Behaviorists and Extension

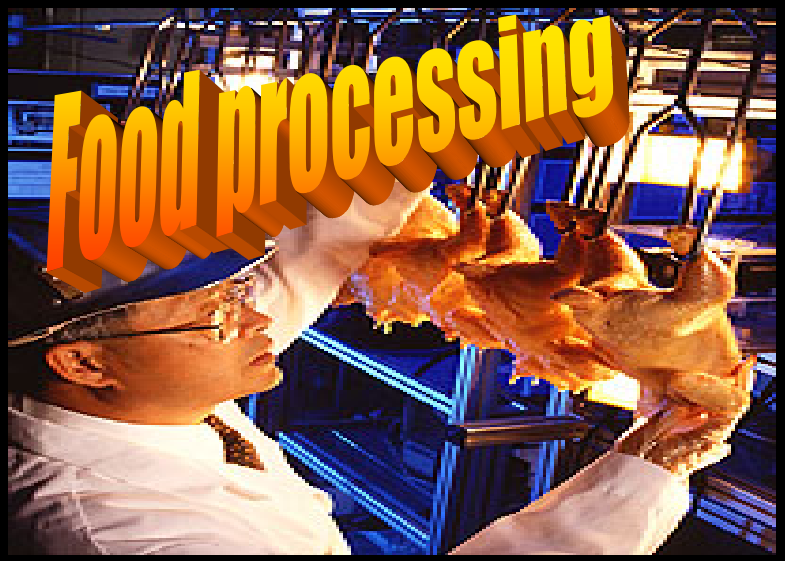
Develop strategies to alter patterns of food consumption and activity to reduce oxidative stress, obesity/diabetes.

Cobia nutrition

Animal Models (Equine, swine, dairy, rodents)

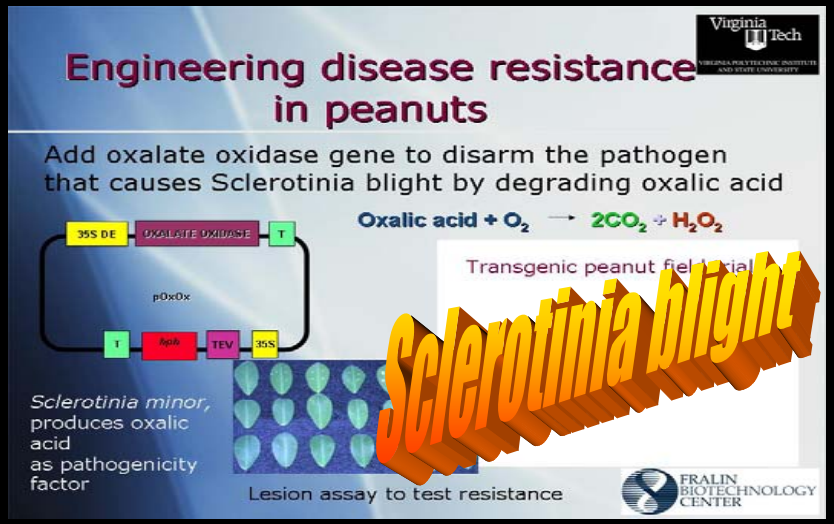


BIOSECURITY
Food Safety and Security



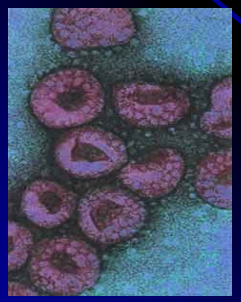
Infectious Diseases
Plants, Animals, and Humans

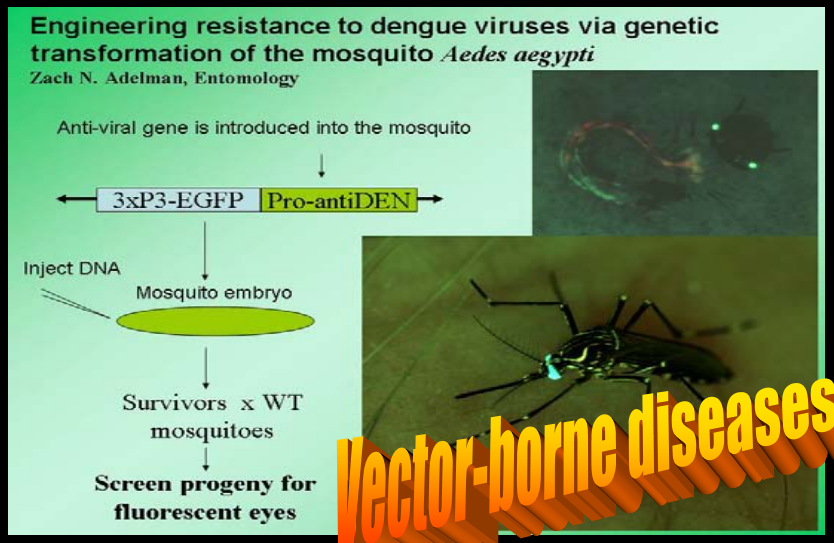
Avian influenza



Sclerotinia blight

Chronic wasting disease





Vector-borne diseases

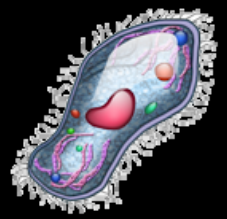
Translational Medicine and Research (TMR)

Infectious Diseases outbreaks
Animal Diseases in Patients
(Animal Models for Human Diseases)

Basic Research
Developments
CVM, CALS, CNR

Veterinary Hospital and
Ambulatory Field Services
(Clinical Environment)

Prevention
Containment
Eradication



Stop &
control
Zoonosis

Testing
Surveillance

Knowledge dissemination and
Practical Clinical Applications
(Translational Medicine) in:

Treatments
Diagnostics
Prevention

Drugs
Nutrition
Devices

Vaccines
Drugs
Nutrition

COMMUNITY ECONOMIC VIABILITY
"Innovation Communities"

Asset-based Economic Development

Wood Enterprise Institute

Entrepreneurial experience –
Design, manufacture, market

High-value horticulture

Orchads

Product development - Organic dairies

Cellulosic drug carrier

Tomorrow, with the help of Cellulose-based nanomedicine from trees…

TODAY: 4-6 h IV injection; threat of anaphylactic shock

Produce markets

AGRICULTURAL AND NATURAL RESOURCES PROFITABLITY AND ENVIRONMENTAL SUSTAINABILITY
(Land preservation and Environmental quality)

Value-Added

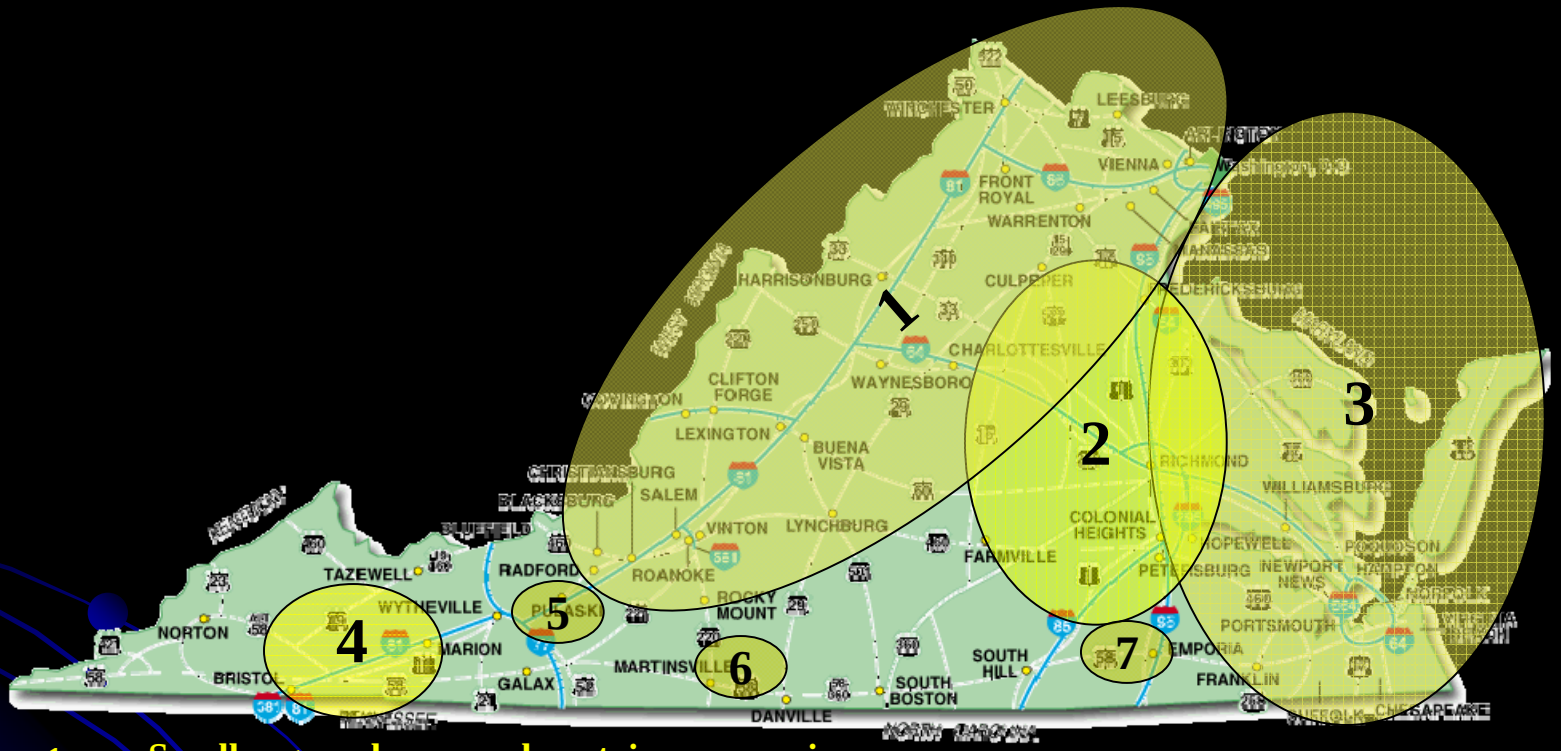

Beef Quality Assurance


Katahdin - Hair Sheep


Speciality Fruits and Vegetables, including Organic


Green Industry - Turf

Landscape, Nursery, and Greenhouse Industries in Virginia (Value-added)



1. Smaller greenhouse and container nurseries
2. Large greenhouse operations & smaller wholesale nurseries
3. Large greenhouses and wholesale nurseries (mostly container – some field grown)
4. Frasier Fir Christmas Trees

5-7 Christmas Trees


Teaching
Extension
Research
“Creating an Economically Viable and Global Virginia through Innovation”
©1999 Reuven Weiser