



Landscape Assessment of Southern Public Plant Breeding Programs

*Capacity, Continuity, and Stewardship Across
State Agricultural Experiment Stations*

Southern Administrative Heads and CARET Joint Summer Meeting

Athens, GA - July 25, 2026

The Challenge



Core Ideas

- Program transition presents risk of loss of germplasm and knowledge
- Culture shift regarding program ownership is needed
- Leadership transition must be actively planned
- Successful transition requires consistent best practices within programs and coordination with host institutions

agInnovation South Plant Breeding Survey

Why We Conducted the Survey

- Assess the status of Southern public plant breeding programs
- Focus on capacity, continuity, long-term stewardship
- Identify strengths, vulnerabilities, and opportunities

Acknowledgments

agInnovation South gratefully acknowledges the State Agricultural Experiment Stations that participated in this survey and shared information regarding public plant breeding programs across the Southern region. We also thank the members of the Plant Breeding Coordinating Committee (SCC-80) for their ongoing leadership and discussions regarding succession planning, germplasm stewardship, and long-term breeding capacity, which served to motivate this regional assessment.

Capacity, Continuity, and Stewardship

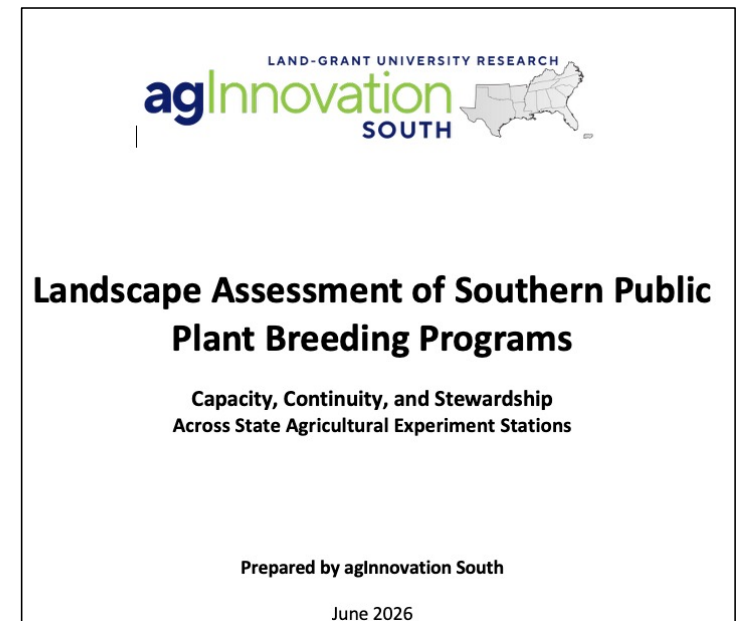
- Breeding capacity & scope
- Major commodity systems, statewide cultivar influence, & economic significance
- Germplasm, adaptation, & broader industry influence
- Specialty, regional, & limited-market crop stewardship
- Transitioning industries & system vulnerabilities

Descriptive Findings

- Commercialization, intellectual property, & partnerships
 - Royalty sharing
 - Intellectual property management
 - Management partnerships
 - Public breeding support & industry alignment

Succession Planning and Program Continuity

Germplasm Capacity, Stewardship, and Continuity



A Diverse and Highly Productive Regional Enterprise

- Southern public breeding programs encompass a highly diverse portfolio of crops, production systems, and institutional models
- Program size, scope, and capacity vary considerably across institutions, reflecting differences in agricultural priorities and resources

Crops	Institutions	Institution Numbers	Breeder Numbers	Representative Crops
Regional Crop Categories				
Grain Crops	Clemson, UK, LSU, NCSU, OSU, TAMU, UF, UGA, UPM, VT	10	28	Wheat, Oats, Rye, Corn, Grain Legumes, Sorghum, Barley, Rye, Triticale, Oats
Forages, Pasture, Bioenergy	Auburn, UF, UGA, MSU, NCSU, OSU, TAMU, UK	8	16	Clover, Vetch, Perennial grasses, Switchgrass
Vegetables	Clemson, UA, UF, NCSU, UGA, UK, TAMU, UPM, UVI	9	31	Tomato, Lettuce, Peppers, Cucurbits, Brassicas, Potato
Small Fruits	Auburn, UA, UF, UGA, NCSU, TAMU	6	14	Strawberry, Raspberry, Blackberry, Muscadine Grapes
Ornamentals	MSU, OSU, NCSU, TAMU, UF, UGA	6	13	Rose, Lily, Coleus, Nursery crops
Forestry	NCSU, UF, TAMU	3	6	Loblolly Pine, Slash Pine, Eucalyptus, Christmas trees
Tree Fruits	Clemson, UGA, UF	3	8	Peach, Pecan, Citrus, Pomegranate
Tropical Specialty Crops	UPRM, UVI, UF	3	7	Sorrel, Dragon fruit, Guar, Cowpea, Coffee, Calabaza, Pigeon Peas



Key Insights

- Public breeding programs continue to deliver strong cultivar adoption and address breeding needs not typically served by the private sector
 - Emerging/niche crops, regional adaptation, pre-competitive research, long-term crop improvement
- Institutional support models and external stakeholder support vary considerably
- Partnerships with USDA-ARS, commodity organizations, industry, and other collaborators are essential to breeding, germplasm stewardship, seed systems, and cultivar commercialization

Emerging Vulnerabilities

- Succession planning is uneven, with most institutions replacing retiring (*or poached*) breeders rather than expanding programs
- Germplasm stewardship and data management systems vary widely, creating risks to long-term preservation and continuity
- Concerns regarding staffing transitions, program continuity, and the potential loss of breeding capacity over time

UF/IFAS Model

In 2025, UF/IFAS implemented a three-part working draft succession plan:

1. **Germplasm Protection Plan:** secure off-site backups and define preservation protocols.
2. **Standard Operating Procedures (SOPs):** document workflows, breeding logic, historical decisions, data structures, and critical program dependencies.
3. **Breeder Transition Plan:** specify overlap periods, handoff processes, emergency transition steps, and institutional responsibilities (*unit leader commitment*)

This structure directly addresses Hale et al.'s “two essential elements” for sustainable transition

- institutional appreciation of a program's holistic value
- current, accurate, actionable documentation

Looking Ahead

Thoughtful investment in people, germplasm, and partnerships is essential to maintain the long-term capacity and impact of Southern public plant breeding programs.

Roughly 70% of state wheat acreage is planted in OSU-developed cultivars, with previous analyses estimating an 8.8:1 return on public investment in the breeding program.

LSU-developed cultivars account for ~60–70% of Louisiana rice acreage, while essentially all Louisiana sugarcane acreage is planted in LSU varieties, supporting industries valued in the hundreds of millions to more than one billion dollars annually.

University of Arkansas reported that UADA-developed rice cultivars account for approximately 25–30% of Arkansas rice acreage, representing an estimated 310,000 acres in 2025.

UGA-developed cultivars account for ~90% of runner-type peanut acreage supporting a crop with an annual farm-gate value of over \$877 million.

~\$2.3 million in direct producer revenue generated by UT soybean cultivars supported nearly \$20.8 million in total economic activity through downstream processing and related industries.