

Landscape Assessment of Southern Public Plant Breeding Programs

Capacity, Continuity, and Stewardship Across State Agricultural Experiment Stations

Overview

Public plant breeding programs are essential components of the agricultural innovation system, relying on sustained scientific expertise, institutional commitment, and stewardship of genetic resources. In 2026, agInnovation South surveyed State Agricultural Experiment Stations across the Southern region to assess breeding capacity, program continuity, commercialization practices, succession planning, and germplasm stewardship. The survey documents a diverse and productive regional breeding enterprise while identifying substantial variation in institutional capacity, support systems, and long-term continuity across breeding programs.

Breeding Capacity, Scope, and Program Impact

Southern State Agricultural Experiment Stations maintain a diverse portfolio of public plant breeding programs spanning major commodity, horticultural, forestry, forage, tropical, and regionally important specialty crops. Survey responses generally reflected three broad institutional profiles: large, diversified breeding programs with extensive infrastructure; mid-scale programs focused on selected commodity systems; and smaller, specialized programs serving individual commodities or regionally important production systems. Institutions reported impacts through cultivar development, germplasm enhancement, trait discovery, regional adaptation, pre-breeding, and long-term stewardship of crops receiving limited private-sector attention.

Survey responses documented widespread adoption of publicly developed cultivars across many Southern cropping systems together with substantial economic and agricultural impact. Institutions reported strong adoption in rice, wheat, peanut, soybean, sugarcane, and sweetpotato while also describing important contributions to fruit, vegetable, turfgrass, ornamental, tropical, and emerging crop industries. Program impact extended beyond cultivar release through germplasm development, regional adaptation, and support for commercial breeding pipelines and long-term agricultural innovation.

Commercialization, Partnerships, and Program Support

Public breeding programs rely on institutional commercialization systems and external partnerships to move cultivars from breeding programs into agricultural production while supporting long-term program continuity. Institutions consistently described public breeding programs as complementing private-sector breeding through regional adaptation, pre-breeding, specialty and emerging crops, and other long-term research priorities that receive limited commercial investment. Institutions reported diverse approaches to royalty distribution, intellectual property management, licensing, and cultivar

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commercialization through technology transfer offices, research foundations, crop improvement associations, and foundation seed organizations.

Financial support is derived from experiment station investments, Hatch funds, royalty reinvestment, grants, and commodity organizations. Collaborative support is provided through commodity groups, industry partners, USDA-ARS, foundation seed organizations, and crop improvement associations that strengthen breeding capacity, facilitate cultivar deployment, and expand scientific capability.

Succession Planning

Approaches to succession planning vary widely across the region. Most institutions reported replacement hiring rather than program expansion, while others described overlap hiring, interim management, documentation of breeding activities, and commodity-specific transition planning. Formal continuity plans remain uneven, although several universities are implementing more structured approaches. Survey responses indicate that continuity is influenced primarily by institutional planning, staffing capacity, and available resources. Several institutions also noted that current and future hires are integrating genomics, phenomics, artificial intelligence, data science, and related technologies into broader crop design programs.

Germplasm Stewardship

Institutions maintain diverse germplasm collections using a wide range of storage facilities, documentation practices, and data management systems. Capacity ranges from modern facilities with redundant storage to decentralized or aging systems with limited backup capability. Many institutions supplement local resources through USDA-ARS repositories and national or regional germplasm networks.

Stewardship increasingly extends beyond physical storage to include preservation of breeding populations, phenotypic and genotypic data, breeding records, and institutional knowledge supporting long-term cultivar development. Respondents identified continued needs for improved redundancy, digital data management, interoperability, and documentation to strengthen long-term breeding continuity.

Overall Observations

Together, the survey responses provide a regional snapshot of how Southern public plant breeding programs are organized, supported, and sustained. The findings document a productive and highly diverse regional breeding enterprise while revealing substantial variation in breeding capacity, commercialization systems, succession planning, and germplasm stewardship across institutions.