

TEXAS A&M AGRILIFE RESEARCH AND EXTENSION CENTER AT BEAUMONT

The Beaumont Center was created at nearby Amelia, Texas, in 1909, just 10 years after rice became a commercial crop in the state, having been grown historically in South Carolina and Georgia. In 1914, the U.S. Department of Agriculture joined Texas A&M in rice research at Amelia, which focused on improving varieties, production, and management systems. The center became Substation No. 4 of the Texas Agricultural Experiment Station. By 1945 it had outgrown its Amelia facilities and was moved to its present location in Beaumont on land financed by a group of farmers who were founding members of the Texas Rice Improvement Association. In 1970, the Texas Legislature created the Eagle Lake Research Station, west of Houston. In September 2008, it was renamed the David R. Wintermann Rice Research Station in honor of a longtime rice farmer and conservationist who, with his wife, Eula, helped to establish the station at Eagle Lake.

The Beaumont Center is an international leader in the development of improved rice cultivars and rice production and management systems and is recognized for its strengths in quantitative analysis of cropping systems interactions. It is increasingly recognized for the development and use of marker- and model-assisted selection



methods and has undertaken major research efforts in developing bioenergy crop production and management systems. As an important component of its teaching mission, the center heavily invests in graduate student training.

The center concentrates on Upper Gulf Coast agriculture, including rice insect, weed, and plant disease management; water conservation; genetics; molecular and crop model-based plant breeding; plant physiology; grain quality improvement; soils and crop nutrition; and integrated agro-ecosystem research. It produces high-yield, semi-dwarf rice varieties and superior rice production and management programs that are suited to the Gulf Coast environment. Finding ways to better grow rice, soybeans, sugarcane, energycane, and biomass sorghum are all part of the Beaumont Center's research.

CURRENT RESEARCH

DEVELOPING IMPROVED RICE CULTIVARS FOR YIELD AND QUALITY PERFORMANCE

'Colorado' and 'Antonio', approved for release in early 2012, are the first rice cultivars developed by Texas A&M AgriLife Research. They are also the first cultivars of any crop species developed using marker- and model-assisted selection. In 2007, the Beaumont Center began to lay the foundation for a hybrid rice-breeding program, and by 2015, over 300 parental lines had been created. A strong partnership with the Texas Rice industry focuses on creating a cutting-edge hybrid-

rice-breeding program built upon advanced phenotyping developed around both marker- and model-assisted trait selection. Beaumont Center researchers continue to develop non-transgenic, herbicide-tolerant germplasm that will be useful in inbred and hybrid cultivar development. They are co-leaders in discovering molecular markers and genes that control the concentration of minerals affecting human nutrition in rice grains. This research represents the largest such effort for a crop species. The plant populations and physiology methods used at the Beaumont Center are unique tools aiding this gene discovery, for which the National Science Foundation recently funded a rare fifth-year creativity extension.

DEVELOPING IMPROVED CROPPING SYSTEMS AND PEST-MANAGEMENT PROGRAMS

Sustainable organic rice production is a specialized area of Integrated Cropping System Management (ICSM), which affects both grain yield and profitability for rice growers. AgriLife Research scientists at Beaumont lead a federally funded project to develop sustainable organic rice production using cover crops and soil amendments. They are also leaders in the development of cost-effective and sustainable rice integrated pest management (IPM) production systems. The center's entomology research program led the development of insecticidal seed treatments. Approximately 60% of Texas rice-producing acreage now receives these treatments, which minimize drift of insecticides into fragile man-made and natural wetlands. Center scientists also co-developed the stalk borer IPM program, which is reducing the impact of stalk borer pests.

The Beaumont Center's plant pathology research program is a national leader in developing innovative blight-management options that use beneficial growth-promoting bacteria, bio-fumigation cover crops, and rate-reduced fungicides. It also leads development of water- and fertilizer-efficient rice production systems and promotes optimization of cutting heights to increase ratoon crop production.

DEVELOPING PROCESS-BASED CROP MODELS

The Beaumont Center is an international leader in the development of process-based crop models, which integrate knowledge across biological scales. Process-based models allow clarification of genotype x environment interactions, which is not possible in models with less physiological detail. This effort led to the first implementation of a marker- and model-assisted rice cultivar selection program.

RESEARCH IMPACTS

- The Beaumont Center has released two new rice varieties that yield 7% and 9% more than current inbred rice varieties, translating into greater profits for growers.
- Center researchers have identified the genetic basis for uptake of both beneficial and harmful minerals and metals. This research could lead to rice varieties with improved nutritional benefits.
- Beaumont scientists are developing a regional pest-management production system that integrates sugarcane, rice, and energycane production, with Louisiana State University and the USDA's Agricultural Research Service.

BEAUMONT CENTER FACILITIES

Beaumont — Located on 960 acres, the Beaumont Center is regional home to Texas A&M AgriLife Research and the Texas A&M AgriLife Extension Service, the USDA-ARS Rice Research Unit, and the Texas Rice Improvement Association.

Eagle Lake — The David R. Wintermann Rice Research Station at Eagle Lake is located on 113 acres and expands the Beaumont Center's ability to address the needs of Upper Gulf Coast agriculture.

ABOUT TEXAS A&M AGRILIFE RESEARCH

A member of The Texas A&M University System

Established in 1888, Texas A&M AgriLife Research is the state's premier research and technology development agency in agriculture, natural resources, and the life sciences. Headquartered in College Station, AgriLife Research has a statewide presence, with scientists and research staff on other Texas A&M University System campuses and at the 13 regional Texas A&M AgriLife Research and Extension Centers. The agency conducts basic and applied research to improve the productivity, efficiency, and profitability of agriculture, with a parallel focus on conserving natural resources and protecting the environment. AgriLife Research has 550 doctoral-level scientists, many of whom are internationally recognized for their work. They conduct hundreds of projects spanning many scientific disciplines, from genetics and genomics to air and water quality. The annual economic gains from investments in Texas's public agricultural research are estimated at more than \$1 billion. Through collaborations with other institutions and agencies, commodity groups, and private industry, AgriLife Research is helping to strengthen the state's position in the global marketplace by meeting modern challenges through innovative solutions.

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