

# TEXAS A&M AGRILIFE RESEARCH AND EXTENSION CENTER AT OVERTON

**T**he Overton Center opened on June 1, 1967, thanks to the initiative of East Texas agricultural and community leaders and the Bruce McMillan, Jr. Foundation. The McMillan Foundation initially provided \$300,000, 150 head of Hereford cattle, 22 acres of land, and three tandem 25-year leases for an additional 1,221 acres. The J. T. Montgomery family donated 4.5 acres for the center headquarters building; McMillan contributions later totaled over \$700,000.

Research at the Overton Center targets specific needs of East Texas that must be addressed in the East Texas ecosystem. Major contributors to East Texas's annual agricultural income (about \$6 billion) are livestock (primarily beef cattle), nursery crops, poultry, and timber. Other agricultural income is from feed crops (including hay), vegetables, recreation, and dairy.

Texas A&M AgriLife Research programs at Overton address beef cattle, hay and forage crops, and horticulture, with some attention to forestry and rural recreation. The center focuses on two major income generators: (1) Forage-Based Beef Cattle Production Systems and (2) Horticultural Production.

Research simultaneously addresses issues of production parameters plus economic and environmental sustainability. The subject matter disciplines of soil science, plant physiology, plant and animal breeding and genetics, animal physiology, and production-system science are focused on fundamental, translational, and applied research targeting the highest-priority issues. The discovery of new agricultural principles and the technology transfer of these principles and production applications are key components of research goals.

## CURRENT RESEARCH

### DEVELOPING ADAPTED CLOVER AND RYEGRASS VARIETIES

In the past 10 years, the Overton Center released and licensed seven new forage cultivars: 'Neches' white clover, 'Rio Verde' lablab, 'Sabine' crimson clover, 'Blackhawk' arrowleaf clover, 'Silver River' sweetclover, and 'TAM TBO' and 'Nelson' ryegrasses. The early and profuse flowering traits of 'Neches' clover will save stakeholders approximately \$1 million each reseeding year, assuming 'Neches' is only 5% of total white clover use. 'Sabine' crimson clover was developed to improve the reliability of long-season forage production as a component of ryegrass-clover mixtures. 'Blackhawk' is the first arrowleaf clover with multiple pest resistance, and 'Silver River' sweetclover is a rust-resistant cultivar developed for South and Central Texas. The two new tetraploid ryegrass varieties have improved vigor and productivity over previous varieties.

### STUDYING SOIL HEALTH AND ENVIRONMENTAL QUALITY

Recently initiated studies focus on factors affecting environmental sustainability, including soil microbes, greenhouse gas emissions, and related items. Data collection will link production and environmental measures.

### ENHANCING GRAZING MANAGEMENT FOR SUSTAINABILITY

The Overton Center has identified stocking rates and strategies to optimize sustainable land-use efficiency by producing beef cattle weight gains on pasture. Forage and soils data from long-term experiments document the impact of stocking rates and fertility regimens on soil nutrient status at multiple depths. Nutrient cycling returns key nutrients to pastures via excreta and plant decomposition, providing a way to grow forage without nitrogen fertilizer. This in turn reduces the need for fossil fuels used to produce fertilizer. This research has enhanced the efficiency of producing natural forage-fed beef.

A 30-year project at Overton revealed the impact of grazing management on bermudagrass ecotype composition. Current and long-term pasture and plant sampling documented extensive ecotype diversity in response to beef cattle stocking rate, fertility regimens, and other factors. The long-term study provides data on the carbon content of soils from bermudagrass pastures that were either fertilized with nitrogen or managed with legumes and were tested with three levels of grazing pressure. The data show that stocking rate, fertility regimen, and overseeding of ryegrass or clover enhanced carbon sequestration.

## RESEARCHING STRESS RESPONSES IN BEEF CATTLE

Overton Center researchers study the effects of early puberty, temperament, and other stress factors on the growth, reproduction, and health of tropically adapted beef cattle. Research on stress responsiveness shows that cattle temperament affects production efficiency, immune response, and product quality. The effects of prenatal stress are being studied in cattle, and results show that prenatal stress alters temperament, energy metabolism, and immune function. Epigenetic effects may play a part in these observed differences; altered DNA methylation patterns were found to exist between treatment groups. The center is developing an early-calving line of tropically adapted Brahman cattle to increase beef-production efficiency in Texas and in tropical regions throughout the world.

## EVALUATING ORNAMENTAL PLANT VARIETIES FOR PERFORMANCE

Hundreds of new varieties of ornamental plants have been tested at the Overton Center to determine suitability for use in the region. The best-adapted ones have been identified as Texas Superstars® and promoted to stakeholders through regional programs, websites, and field days.

The Texas Superstar Program featured three major plant promotions each year in 2015 and 2016. Each one increases sales and promotes the use of Texas-friendly ornamental plants.

The Overton Center initiated cooperative research to develop roses broadly adapted for heat tolerance and disease resistance. These roses would increase the sales of the National Flower and provide landscape plants that would reduce the need for pesticides and have reliable ornamental value for home and commercial landscapes. Center researchers also cooperate on a national project focused on rose rosette disease.



## RESEARCH IMPACTS

- Overton Center research has a current annual economic impact of \$150 million on the \$1.5 billion forage, pasture, and livestock industries of East Texas.
- The center has contributed to the growth of horticulture in East Texas to an over \$1.2 billion industry.
- Overton Center research has influenced the American Brahman Breeders Association to add an expected progeny difference (EPD) for “Docility” to herd-improvement guidelines.

## OVERTON CENTER FACILITIES

**Overton** — 28,186 square feet at the headquarters building approximately 2 miles north of downtown Overton, including an auditorium seating 275, a classroom, kitchen, videoconferencing, offices, and laboratories. The grounds contain six greenhouses, one head house, chemical storage, and a shop. Research is conducted on 1,300 leased acres of pasture, forest, and plot lands.

## 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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