Intelligent Agricultural Systems
89th Legislature: Priority Request

TEXAS A&M AGRILIFE RESEARCH

Objective

Texas A&M AgriLife Research requests support from the 89th Legislature to invest in increased equipment and personnel to move agricultural production systems toward an improved paradigm that combines advanced sensor technology, digital models and automated data analysis. Together, these advances will optimize operational efficiency, elevate resiliency and fortify sustainability in the state's agricultural operations.

Challenges facing agriculture

- Increasing prices for inputs including feed, fuel, fertilizer, pesticides and more
- New pests and diseases
- Changing environments
- Increasing regulation
- Agricultural labor shortages

Responding to challenges with precision technologies

Technologies that keep pace with changing environments will be economically and environmentally sustainable through advances in precision agriculture — the ability to address challenges at the level of individual plants and animals.

These technologies will propel agriculture into a new era of sustainability, profitability and mutual advancement of human and environmental health.

Over the last century, Texas has remained a top agricultural producer in the U.S. due to industrial mechanized technologies. As Texas has become a hub for more tech companies, the state is poised to lead the country in advancing rapidly emerging "smart" agricultural production technologies.

STRENGTHEN *TEXAS* AGRICULTURE

Texas A&M AgriLife Research pioneers knowledge about agriculture, natural resources and the life sciences to nourish health, strengthen communities and support economies. A member of The Texas A&M University System, AgriLife Research advances the land-grant mission of research, teaching and extension.
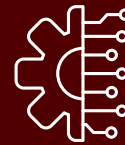
$26 million
Over 2024-2025 funding levels

Benefits to Texans
Anticipated outcomes over the next two years

A robust new data processing engine

Reductions in livestock diseases

Increases in annual savings

Annual savings increases via smart feeding technology implementation

Increases to Texas ag receipts through improved food safety

Cotton yield increases

Increases in revenue

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Solutions in Intelligent Systems

Intelligent systems have solved many challenges related to labor and efficiency in shipping, manufacturing, watershed management, city planning and a host of other sectors. Advancement of these technologies is critical to the next phase of sustainable agricultural production that improves lives and livelihoods. Intelligent Agricultural Systems require increasing the capacity of Texas A&M AgriLife Research to lead scientific innovation.

New and modern equipment

Expert personnel

Upgraded laboratories

Training next generation researchers

Positioned to Lead

Texas A&M AgriLife Research, with its statewide network of scientists, is uniquely positioned to lead the development and implementation of data-driven, intelligent agricultural systems for Texas' integrated soil-crop-animal agriculture resources. AgriLife Research maintains a collaborative approach across industry and academia, and Texas A&M University is home to the largest engineering workforce in the United States. We will harness these capabilities to undertake the skill-intensive work of precision sensor design, building, data integration and analytics.

Support advances in several interconnected research areas

Remote Sensing
The integration of satellite-based data in precision farming practices to help apply inputs based on specific field conditions, leading to optimized resource utilization and improved crop yields.

Smart Irrigation Systems
New technologies for optimized water usage and precise irrigation.

Precision Crop and Livestock Monitoring Technologies
Precision agriculture technologies, such as GPS-guided machinery, drones and sensors, allow for unprecedented accuracy in monitoring soil conditions, crop health and weather patterns, improving resource utilization.

Transdisciplinary Data Integration
Implementing data-driven predictive and prescriptive analytics for crop and livestock forecasting to optimize planting and animal management in real time.

Takeaways

+ Technology-driven ag can meet growing demand for sustainable, traceable products

+ Return on investment relates to new opportunities for producers to use and benefit from intelligent agricultural systems

+ Our program will include comprehensive economic impact research of precision agriculture

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