Goal 1: Enhance Crop and Landscape Water Conservation

- Results in water conservation for leafy greens at Texas A&M AgriLife Research and Extension Center at Uvalde continue to be impressive for the recirculating hydroponic system, with more than 90% of water savings as compared to those grown under field conditions.

- The hydroponic project reached over 350 individuals through educational programs, consumer panels and field days. The project attracted a multi-million dollar hydroponic system investment in Texas.

- A 2-year research project in Uvalde showed that integrating strip tillage into a cropping system increased watermelon yield efficiency (biomass per inch of water applied) by 15%.

- Integrating deficit-irrigation strategies with specific crop coefficients can improve pepper water-use efficiency, up to 25%, in water-limited regions of Texas.

- Findings on plant growth regulators aimed to alleviate transplant ‘shock’ and reduce crop losses in stressful environments are economically significant for high value crops such as tomato and pepper.

- The Agronomy program is using novel computing tools for physiologists and breeders to collect large amounts of plant and soil data. This will have implications for adoption in both high and low input systems.

- The Agronomy and Vegetable programs attracted three international visiting scholars and two graduate students to strengthen research in row crop drought adaptation, plant environmental stress physiology, root enhancement and genetics.

- A third of the annual residential water in Texas ends up being poured on the ground to keep the landscaping green. AgriLife Research shows that many ornamental plants can grow just as well when irrigated/watered with “grey water” from bleach-free household laundry.

- Irrigation with grey water could save 400,000 acre feet of potable water per year within the state, or about 8 percent of annual potable urban water use.

Goal 2: Sustain and support efficient use of land resources

- In response to regional growers’ needs, Uvalde researchers are expanding the cropping system project by adding drought tolerant crops into the rotation systems. The Center is partnering with Sesaco Co. to test sesame growth and yield responses to irrigation regimes in southwest Texas.

- Research on improving stand establishment of artichoke showed that using low-level nitrogen fertilization can improve transplant quality and their ability to withstand drought and heat shock in the field. These results will improve profitability by reducing fertilizer input costs.

- The cropping system project created undergraduate minority students jobs, expanding training and educational opportunities, as well as enhancing the public understanding of agricultural research in the Wintergarden region and beyond.
Goal 3: Basic and translational research into factors affecting biological diversity

- Uvalde researchers are collaborating with the International Conservation community to aid successful repopulation of endangered African ungulates bred on Texas ranches back to their native lands.
- Texas A&M AgriLife research in conjunction with Texas A&M AgriLife Extension are conducting multiple, diverse studies to help solving the chronic decline in wild quail populations and restore healthy populations of this iconic gamebird.

Goal 4: Improve agricultural production and efficiency through advances in plant breeding and management

- Uvalde researchers collaborated with USDA scientists to build a multisensory cart for rapid phenotyping and crop traits monitoring. This innovative tool will facilitate screening and selection of improved genotypes with drought and heat stress tolerance and high productivity.
- The Uvalde vegetable physiology and TAMU plant breeder team developed a new tomato cultivar 'TAM Hot-Ty' which provides excellent quality, is heat and virus resistant, and produces high yields on a small, compact plant, saving both space and water. This cultivar has attracted the attention of Texas growers and retailers.
- The vegetable team conducted five field trials of 75 elite TAMU pepper hybrids to evaluate yield, fruit quality and resistance to viruses and bacterial leaf spot. This led to identification of three hybrids for commercial license by a seed company and 10 others for further testing with commercial growers.
- This team also conducted trials of 34 experimental TAMU hybrids, 29 elite inbred lines and 21 commercial cultivars of specialty cantaloupe melons. This led to identification of 5 candidate hybrids for larger commercial trials which had high sugars, large fruit and powdery mildew resistance.
- Research on the use of starch-based plasticulture system revealed that the degradation of biodegradable mulches was almost 100% after 12 months from transplanting. Biodegradable mulches require minimal labor for removal and disposal after harvest and can reduce soil environmental pollution in comparison to polyethylene plastic.
- Uvalde research on screening efficient sources of organic can potentially enhance soil microbial activities, soil physical and chemical proprieties, and plant performance, helping Texas organic growers maximize their profits.

Goal 5: Add value to raw agricultural products

- Wildlife is a valuable resource in Texas bringing in over $6.2 billion annually. Researchers at Uvalde work with private landowners to increase the quantity, quality and diversity of wildlife in Texas. This wildlife provides healthy, outdoor, recreational opportunities for 6.3 million people who hunt, fish or watch wildlife in Texas each year, and in doing so support many jobs in the wildlife related service and retail industries.
- Uvalde AgriLife Research and Extension faculty are researching the adaptation of specialty crops for growth in southwest Texas. Studies are conducted on stress management, N fertilization, and irrigation practices (drip, center pivot, hydroponics) on a variety of new crops such as globe artichokes, diverse melon types, bibb and romaine lettuce, kale and other leafy greens, determined tomato, olives and grapes.
- The agricultural enterprises in the Wintergarden region are vital for the prosperity of southwest Texas with a farm gate value estimated at $564 million (2013). We expect that within 10 years, a 10% future expansion of high value crops will have an additional economic impact of $84 million.