

THE THOMAS RANCH, TASK FORCE 8 REPORT

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Submitted: July 16, 2021



Thomas Ranch, Task Force 8 Report

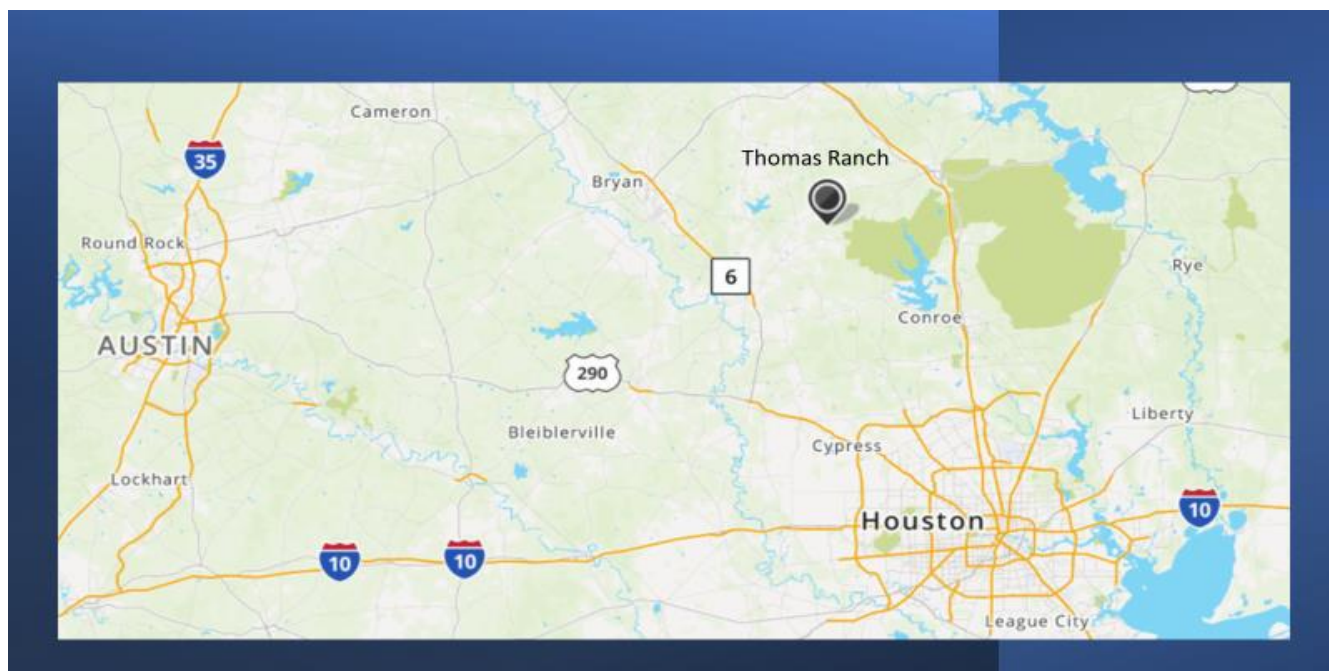
The Thomas Ranch:

The Thomas Ranch located in Anderson has been bequeathed to Texas A&M University.

The property is a working ranch including 3,000-acres, populated with more than 700 cows and their calves, as well as 4,500 grape plants in a six-acre vineyard.

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Our Charge:

The Task Force was charged with generating a feasibility assessment and options report for the best use of the Thomas Ranch.

The options report would include and detail the potential for unique research and extension programming on the property and include a financial plan.

Task Force 8 should examine the potential for the property to serve as a venue to educate urban students about agriculture and rural students about the arts, as envisioned by the donor.

The plan should also explore the possibility for public engagement through public-private partnerships or corporate collaborations with companies, as well as other innovative approaches related to the ranch's mission, programs, and finances.

Procedure Used by the Task Force:

Five subcommittees were formed to explore the options for the best use of the ranch in the following activities:

1. Livestock/pasture research and production – Leader Dr. Brent Auvermann
2. Viticulture/Horticulture research and production – Leader Dr. Justin Scheiner
3. Urban agriculture research – Leader Dr. Juan Landivar
4. Education and outreach – Leader Dr. Billy Zanolini
5. Timberland production and research – Leader Dr. Bill Oates (TFS)

All subcommittees were asked to meet and explore opportunities to implement at the ranch, considering that information on the assets or finances for the facilities would not be available.

Activity One - Livestock Enterprise Report

The subcommittee on livestock enterprise met via Microsoft Teams. Volunteers present for this meeting were:

- Dr. Brent Auvermann, Subcommittee Chair and Center Director, Amarillo
- Allen Homann, CEA-ANR, Grimes County
- Donnie Montemayor, DEA, District 11, Corpus Christi
- Dr. Vanessa Corriher-Olson, Assoc. Prof. and Extension Forage Specialist, Overton
- Brandon Gregson, CEA-ANR, Montgomery County
- Dr. Jason Banta, Assoc. Prof. and Extension Beef Cattle Specialist, Overton
- Dr. Billy Zanolini, Asst. Prof. and Extension Specialist – Youth Livestock and Agriculture, College Station
- Dr. Jason Cleere, Associate. Prof. and Extension Beef Cattle Specialist, College Station
- Dr. Andy Herring, Riggs Professor of Animal Science, College Station
- Dr. Ron Gill, Professor and Associate Dept. Head for Extension Animal Science, College Station
- Dr. Juan Landivar, Task Force Chair and Center Director, Corpus Christi and Weslaco

The primary goal of the subcommittee was generating ideas for research, education, Extension, and outreach at the Thomas Ranch. The group reached broad agreement on the following principles in addition to the individual project/program ideas:

1. To the extent possible, we need to benchmark the fiscal performance of the livestock enterprise as it currently stands. The benchmarking exercise will give us a basis for evaluating the livestock enterprise's profitability, selecting management interventions to improve fiscal performance, and evaluating changes in fiscal performance traceable to management changes.
2. Similarly, we need a comprehensive asset inventory of the livestock enterprise at Thomas Ranch.
3. A unifying theme for the livestock enterprise at Thomas Ranch, if one can be identified and articulated, will help us market the opportunities for external sponsorships, endowments, gifts, and even recurring support. One candidate theme might be holistic ranch management with special emphasis on (a) the business aspect of livestock production and (b) local adaptation of ranch-management systems.
4. Successful, revenue-generating or -neutral programs already underway by AgriLife and allied organizations at the Thomas Ranch need to be continued. Those include:
 - a. In-depth beef and forage educational series and small-landowner series

- b. Feral hog management
 - c. Norman Borlaug Youth in Agriculture Program - livestock already included, Cactus Feeders is a major sponsor already, urban connection to agriculture
 - d. Past programs in seasonal forage systems; result demonstrations (e. g., weed and brush control); rotational grazing; optimizing grazing management to match cattle health, body condition, nutrition, and reproduction; vector and parasite management. Revenues: those needing CEUs might be willing to pay registration fees; event sponsorships; local Farm Bureau sponsorships.
5. The Thomas Ranch as a whole, not just its livestock enterprise, provides an excellent venue for AgriLife’s legislative-outreach activities, especially those involving urban officials who would benefit from a richer understanding of agriculture and who could facilitate the development of urban outreach as Mr. Thomas envisioned.

New ideas included:

- 6. Youth education
 - a. Agricultural awareness/Path to the Plate
 - b. Beef cattle production and nutrition
 - c. “Field-to-Table” programs such as that in Jefferson County – pasture preparation, harvest, rotational grazing, feedlot/finishing, slaughter, retail grocery, and dinner table.
 - d. Culinary education
 - e. “Everything but the Moo”
- 7. Producers and their associations
 - a. Forage Field Day like the O. D. Butler Field Day in Robertson County; add a youth track like that of the Cow-Calf Clinic, including a scholarship program. Revenues: event-by-event sponsorships (e. g., Ag Workers Mutual, Capital Farm Credit).
 - b. Soil testing and interpreting soil-test reports (NRCS)
 - c. TSCRA ranch gatherings – membership updates and promotion, socials
 - d. Texas Beef Council events
 - e. NCBA Environmental Stewardship Award Program regional winner selection committee
- 8. Urban adults (including their children as appropriate, and TAMU Former Students)
 - a. Agrotourism – Thomas Ranch as an agricultural destination including beef/wine, culinary competitions, BBQ competitions, galas and fundraising events; partnerships with TAMU and SHSU art departments.

- b. Bed and breakfast (idea: auction for football weekends?)
9. University students
- a. Prairie View beef-cattle production class, Thomas Ranch as a living laboratory
 - b. Understanding consumer preferences – meat quality (Dr. Rhonda Miller’s lab) in conjunction with oenology
10. Public officials or aspiring leaders
- a. Legislative aid updates
 - b. Leadership development programs
11. Researchers
- a. Small-scale research – Internet of Things, remote sensing, geofencing, pasture biomass inventory, animal health status, drought sensing, monitoring technologies
 - b. Carrying capacity vs. genetics vs. management – not enough land to do replicated research with bovines
 - c. Likely greatest potential: Demonstration (comparison of ranch management approaches by dividing the ranch into two and managing them differently)**
 - d. Carbon sequestration

Activity Two - Viticulture/Horticulture Research and Production Report

Members: Dr. Justin Scheiner, Joshua Johnson

Thomas ranch contains a 7-acre production vineyard planted with red wine (Lenoir/Black Spanish) and white wine (Blanc Du Bois) grapes. The vineyard is approximately ten years old and is located adjacent to the main house. Vines are trained on a Watson Training System and are drip irrigated from a well on property. The production potential of the vineyard is between 14 and 28 tons of grapes valued at \$1,400-\$1,600/ton, and production costs will likely average between \$17,500 and \$25,000/year. However, the vineyard sustained significant winter injury in February 2021 and additional labor will be required to retrain and replace damaged vines. To maintain the vineyard in its current state, 1 full-time employee + seasonal labor is recommended. Tasks that require additional labor include pruning (January-March), retraining (April-June in year 1), and harvest July/August. In the past the fruit has been sold to local wineries, and contract negotiations typically take place no later than six months before harvest.

Financial Considerations, Sources of income:

The average yield for Blanc Du Bois and Black Spanish in Texas is 2 to 4 tons/acre. The price of these grape varieties ranges from \$1,200 to \$1,600/ton. The grapes may be sold outright, or custom wine could be produced (Aggie/Thomas Ranch label) by a local winery. This may be accomplished through a custom crush agreement alleviating the need for AgriLife to hold a G-Winery permit. Based on a production of 3 tons/acre, the Thomas Ranch Vineyard could produce approximately 16,000 bottles of wine annually.

Potential for Other Horticulture Crops

The soil, water, and climate at Thomas Ranch are conducive to other horticulture crops. However, the Department of Horticultural Sciences currently maintains a Teaching, Research, and Extension Center in Burleson County, approximately 10 miles from campus, so it is unlikely that Thomas Ranch would attract researchers located in College Station. Establishing horticulture crops for production would require a significant investment but teaching gardens could be developed onsite to support youth education and activities at a much lower cost.

Potential AgriLife Activities

Extension

Existing programs for industry stakeholders that could be hosted onsite:

- Workshops: Prospective Winegrower, Pruning & Training, Grape Pest Management, Nutrition & Irrigation, Advanced Viticulture Short Course
- Field Days: Annual Gulf Coast Grape Grower Field Day, Blanc Du Bois Symposium, Black Spanish Symposium
- Tailgate meetings: informal meetings to discuss relevant issues

- Programs for the public:
- Grape Harvest and Small-Scale Winemaking
- Backyard Grape Production
- Wine 101
- Wine and Food Pairing/Wine Dinners

Teaching

High Schools

- Viticulture field trips (Viticulture is a TEA approved innovative high school course)
- Teacher retreats (AgriLife Extension developed a high school viticulture curriculum)

Texas A&M

- HORT 419 Viticulture (taught spring semesters): field trips, projects
- HORT 491 Undergraduate Research
- HORT 484 Internship

Research

- Best practices for Blanc Du Bois and Black Spanish
- Pruning and canopy management practices
- Vineyard Floor management
- Graduate student research

Activity Three - Urban Agriculture Report

By Juan Landivar and Carl Muntean

Responsive Urban Agriculture is a resilient and dynamic agriculture production system that focuses on developing tasty and nutritionally rich foods to overcome diseases related to malnutrition in urban communities. It leverages state-of-the-art innovations in biotechnology, genotype development, best management practices, and socioeconomic concerns to ensure the timely production of cost-effective food to meet the ever-growing urban population of Texas. The Responsive Urban Agriculture concept requires a transdisciplinary research and education team composed of experts in agriculture, genetics, nutrition, geospatial science, and health care disciplines to address complex human health problems (figure below).

This activity is in accordance with objectives of the Institute for Advancing Health through Agriculture (IHA), which was established to advance science at the intersection of agriculture and human nutrition. It also aligns with strategic priorities areas that Texas A&M AgriLife Research will emphasize over the coming years to make measurable progress toward enhancing the resilience of agricultural systems and ensuring an abundant supply of high-quality nutritious foods for our citizens.

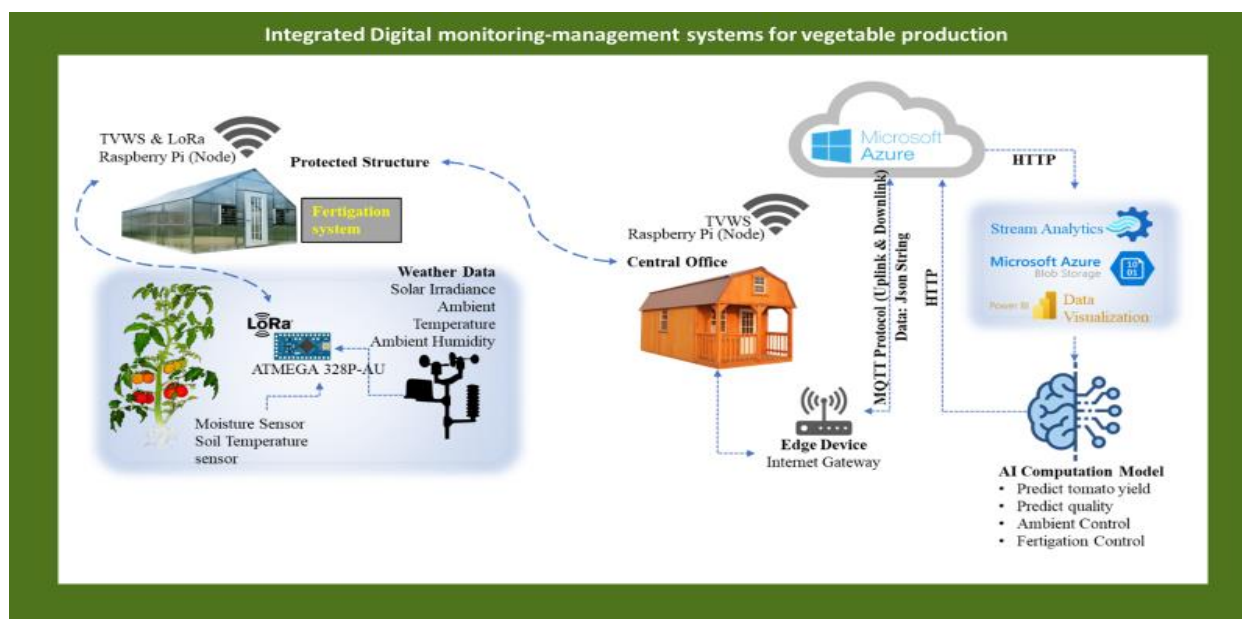
Because of the strategic location of the Thomas Ranch near urban centers (Houston, Conrad), this subgroup recommends implementing the production of vegetables under protected structures. Food production using protected culture is the practice of growing plants in structures designed to protect them from environmental stresses and improve the growing environment. As weather patterns continue to change and become increasingly unpredictable, management practices that allow growers to control the production climate is vital. Here are some of the benefits of vegetables production under protected environments:

- **Higher Yields** — Protected environments can be managed to optimize plant growth, as well as result in an increased rate of top-quality, marketable produce. High yield is a vital factor to achieve economic sustainability.
- **Predictability** — Greater control over your growing environment provides insurance against unpredictable weather, resulting in more consistent yields. High quality produce must be available to consumers year-round.
- **Improved Flavor and nutrition** — Consistent, predictable production conditions ensure uniform quality and chemical composition. Protected culture growers can take advantage of specialty products, such as cluster tomatoes and seedless, thin-skinned cucumbers, that are difficult to impossible to grow in the field.

- **Localizing the Food System** — Protected culture growing is one of the most important ways for local food producers to compete with industrial agriculture. More local growers using protected culture to extend their season could reduce over-reliance on single regions for our food supply.
- **First to Market** — Being earlier with a vegetable can help you land and keep market and wholesale accounts for the entire season.
- **Resource Efficiency** — Greenhouses are efficient water users. Compared with open-field irrigation methods in arid parts of the country, relatively little water is lost to evaporation so a high percentage ends up doing its job growing the plant.
- **Pest and Disease Control** — While greenhouse growing doesn't make pest and disease problems nonexistent, it does afford you better control and gives growers the ability to keep leaves dry, avoiding all sorts of rain-related problems.

A challenge of Responsive Urban Agriculture is bringing together the scientific capacity to develop expert management systems and best management practices to produce varieties and genotypes designed by Prescription Nutrition groups to promote human health. Boosting production by adopting these efficient food production systems can play a major role in achieving sustainable supply of food in those urban and semi-urban areas.

This activity links with activity 4 (education and outreach) to train students and users of these production systems, from K-12 to graduate students. It also facilitates partnerships with technology companies such as Microsoft-Farmbeats program, Intel, ORACLE and others.



Activity Four - Youth and Adult Programming Options Report

- Dr. Billy Zanolini, Asst. Prof. and Ext. Spec. – Youth Livestock and Agriculture, College Station
- Dr. Darlene Locke, Assistant Professor and Extension Specialist, RPTS, College Station
- Dr. Robert Strong, Task Force Chair, Asst. Professor and Associate Department Head for Graduate Programs, College Station
- Dr. Juan Landivar, Task Force Chair and Center Director, Corpus Christi and Weslaco

In keeping with Mr. Thomas’ vision for the ranch with respect to youth development, the Thomas Ranch Task Force is presenting options for engaging youth in agricultural, art, and leadership experiences. Mr. Thomas believed the ranch “should be used by Texas A&M University for a retreat, teaching, and research center”. For the purposes of this options progress report, collegiate students will be included as and will be referred to as, youth. The options will be designated as short or long-term based on current staffing models, infrastructure needs, financial investment, and other considerations. Short-term options are past, current, or programs that can be readily implemented based on available resources.

Texas A&M Youth Leadership and Outdoor Center – Long-Term

The Thomas Ranch could provide leadership and camping experiences for urban and rural youth, alike. Through shooting sports, rock climbing, archery, ropes courses, gardening, ziplines, escape rooms, fishing, kayaking and much more – students could engage the outdoor experiences. The Thomas Ranch could support the leadership development and mental health of Texas youth. Corporate partners with an interest in youth outdoor education should be explored. This includes, but is certainly not limited to, Bass Pro Shops, Academy Sports and Outdoors, and others. Further, inter-agency partnerships with Texas Parks and Wildlife and the Texas A&M Forest Service will add tremendous value to the outdoor experience at the Thomas Ranch. Academic partnerships with TAMU Wildlife and Fisheries Sciences, TAMU Natural Resources Institute, TAMU Recreation, Parks and Tourism Sciences, and Texas 4-H Natural Resources will enhance the quality and depth of programming at the Thomas Ranch. The center would provide a natural setting for research domains in leadership, outdoor education, mental health, experiential education, and creative learning opportunities for youth.

Agricultural Leadership

Texas 4-H Livestock Ambassador Program – Short-Term

For more than a decade, the Texas 4-H Livestock Ambassador Program has successfully trained over 600 motivated and talented youth leaders with a passion for animal agriculture. Ambassadors apply to be selected into this award-winning and immersive agricultural

experience. The program is a three-year progression of professional growth ranging from their initial statewide leadership position to culminating in the capstone study abroad experience. Texas 4-H Youth Livestock and Agriculture (TYLA) spends considerable time and resources training them to effectively share the animal agriculture story with elected officials and the public. Equally important, Ambassadors protect and grow interest in animal agriculture by mentoring novice 4-H and FFA members in their communities. These servant-minded youth leaders are truly making an impact locally, regionally, and nationally. Without question, they are the future leaders of agriculture that will be instrumental in meeting the challenges and opportunities in world food and fiber production. The Thomas Ranch has served as an educational resource since 2014.

Norman Borlaug Youth in Agriculture Program – Short-Term

TYLA identified a need to expand leadership programs beyond rural America and genuinely collaborate with urban centers. TYLA realized that complex challenges in Texas and the United States will require leaders from different backgrounds and perspectives to cultivate new solutions. Through challenging and immersive agricultural experiences, students will build lasting and constructive networks. Rural and urban leaders must work together toward a common goal while demonstrating skills in working with people of diverse life experiences. The previous describes the life and work of Dr. Norman Borlaug, Nobel Laureate 1970. Working to solve worldwide starvation in the 1940s, 50s, and 60s, he assembled teams of youth leaders from across the globe to work collaboratively on the greatest problem of their time. The Borlaug spirit is present in all the programming at TYLA, but more acutely in this program. TYLA was humbled and honored to have the Borlaug family's endorsement of the program.

TYLA hopes to continue the Borlaug legacy by promoting the tools, skill and perseverance required to make a positive difference in this world. The Thomas Ranch will serve as the flagship for face-to-face program engagement experiences. Mr. Thomas served on the advisory board for this program and was central to its development. At the time of his passing, he had sectioned off 5 acres for the purpose of a wheat trial in support of the program to launch in 2020. Further, he supported infrastructure development in lodging to support multi-day events for the program. "The Youth Institute" as he referred to the program, executes his dream to bring together the rural and urban communities. As late as December of 2020, Mr. Thomas expected the NBYAP to launch at the ranch in November 2021.

Collegiate Student Organizations

Given the proximity to many college campuses, the Thomas Ranch will be an attractive venue for student organization events. In recent years, the College of Agriculture and Life Sciences Student Council has used the Thomas Ranch for various events. Colleges of Art could also find value in using the artistic resources of the Thomas Ranch for activities and engagements.

Recently, a collegiate leadership training was conducted that included representatives from Texas A&M University, Sam Houston State University, Prairie View A&M University, and Houston Community College. These agricultural leaders of diverse backgrounds and experiences descended on the Thomas Ranch to sharpen leadership skills and build lasting networks.

Agricultural Awareness and Training –

Short-Term

- Grandview Vineyards would provide an incredible setting for the training of high school teachers interested in viticulture and enology curriculum. Texas A&M AgriLife has a successful curriculum for high school students, *Viticulture, Concepts and Practices*. The existing vineyard and carriage house will serve as an ideal hands-on experience in a train-the-trainer model.
- Leveraging existing relationships with Harris County Schools, Texas A&M AgriLife will host high school agricultural science teacher professional development events. Subject-matter expertise would be increased in animal science, horticulture, culinary, and natural resources.

Long-Term

- Ag awareness days have long served as an effective method for introducing the positive impact of agriculture to an audience of youth that is increasingly farther removed from production agriculture. Mr. Thomas deeply believed in not telling, but showing, the urban community how agriculture impacts their lives. He outlined the ranch was “to serve as a setting to educate the urban community about the importance of Agriculture”. The Thomas Ranch is uniquely positioned within reasonable driving distance from schools in Harris, Montgomery, Walker, Washington, Grimes, Madison, Brazos, and Waller Counties. Texas Farm Bureau has traditionally been, and will continue to be, a strong partner in agricultural awareness.
- Path to the Plate programs could be delivered that target youth “From the Field to the Table” focused on the relationship between hay and cattle production to the dinner table. This 5–6-part series would be focused on educating the youth in every step of production from pasture preparation to harvest, to rotational grazing, to feedlot/finishing cattle, to slaughter, and finally to the grocery store/dinner table.
- With respect to expanding gardening and fruit production, The Thomas Ranch has the space and soil types necessary for an engaging learning environment. Through exploration of soil types, the Thomas Ranch could effectively produce more than 12 varieties of fruit. Building on the learn-by-doing profile of the ranch, raised garden

beds and greenhouses could be added to support agricultural awareness and engagement.

Art and Culinary

A central idea of Mr. Thomas' vision for the ranch was to better connect rural and urban people through the fine arts. The Thomas Ranch has a rich history of engaging people of differing backgrounds to enjoy art. In alignment with this spirit, The Thomas Ranch could host a multitude of art-themed programs/events. In this respect, Mr. Thomas explained that the ranch was "to educate the rural community about the importance of the Fine Arts in collaboration with Sam Houston State University". One can certainly see weekend dance trainings, business and dining etiquette, painting, concerts, music competitions, talent competitions, painting competitions, singing competitions and much more hosted at the ranch. The Thomas Ranch should strengthen existing relationships with the Sam Houston State University College of Arts and Media, Jim Connors (organist), and the Houston Livestock Show and Rodeo. Further, AgriLife will expand collaborations with other youth-serving organizations in the fine arts.

Short-Term

- The Thomas Ranch was in development stage with SHSU on a church service program. The program would professionally train aspiring musicians in church-based performances.
- SHSU has existing partnership with the Huntsville Youth Symphony. The Huntsville Youth Orchestra is a community and area-wide children's orchestra, which was organized to provide children who want to play string instruments a place to perform. The Thomas Ranch could serve as a concert venue.
- SHSU was providing multiple concerts annually at the Thomas Ranch and would like to continue to use the facility.

Long-Term

- The Houston Livestock Show and Rodeo wishes to be considered to host art events at The Thomas Ranch in connection with their School Art Program. The Ranch could provide a recommended destination for artistic inspiration for art competitions. The previous aligns with a growing body of research finding mental health benefits when artistic expression occurs in nature.
- SHSU College of Arts and Media hosts youth summer camps in the performing arts on their campus but would consider offering a camp at the ranch. The potential of adding the dynamic learning environment of the ranch is intriguing to SHSU providing lodging for participants comes to fruition.
- Houston Museum of Fine Arts has been identified as a potential collaborator.

Health and Wellness

A world without agriculture is a world without health. The connection between agriculture and health is natural one; however, many fail to see this critical connection. The Thomas Ranch can be the educational catalyst to help people of all ages understand where their food comes from and the impact healthy food preparation can have on prevention of chronic disease.

Short-Term.

- Healthy Texas Youth Ambassador (HTYA) Program is for high school students who wish to make a difference in communities by providing health education. This group of young people are trained in curriculum and programs to address youth health issues through the peer education approach. Utilizing the Thomas Ranch for specialized, single, or multi-day events focusing on connecting agriculture and health, healthy food production, and prevention of chronic disease could be instrumental in further development of the HTYA program.
- Dinner Tonight is a signature program of Texas A&M AgriLife Extension. Special “Dinner in the Field” culinary experiences for educational and/or fundraising purposes could be held to further solidify the connection between agriculture and health, as well as healthy food preparation.
- Path to the Plate Youth Expo is a one-day, multi-county event would showcase production and processing practices of Texas agriculture commodities to educate young people on agricultural impact in Texas, as well as where food comes from. Additionally, a nutrition component would allow youth to realize the connection between agriculture and health.

Long-Term.

- A Demonstration Kitchen and Classroom would allow for experiential learning for youth and adults. This kitchen/classroom combination would be a valuable tool to teach food preparation, home food preservation, meal planning, basic and advanced culinary skills, and food safety to youth, adults, and families. This kitchen could be the hub of culinary and nutrition education on the Thomas Ranch.
- The Teen Cuisine Program is a multi-day training that would empower teens to make wiser choices related to eating practices. Teens would specifically learn food preparation practices, meal planning, and healthy food choices to allow them to make better choices as an adult.
- Path to the Plate Teacher Training is a successful in-service training for teachers which allows them to learn more about food production practices, health, and nutrition so they may deliver research-based lessons to classroom students.

- Texas A&M Youth Barbeque Camp is a new concept supported by faculty working in Texas A&M AgriLife Extension Meat Science. Texas A&M University has been experiencing unprecedented interest and energy with barbeque schools. With many structures and open-air outbuildings, the Thomas Ranch offers many amenities that would allow for a youth barbeque camp at scale.

Natural Resources

Research clearly outlines the mental and physical health benefits of spending time outdoors. The Thomas Ranch will offer a variety of outdoor activities through crucial partnerships and collaborations. Potential collaborators include, but are not limited to, Texas Parks and Wildlife Department, Texas A&M Forest Service, and the Texas Wildlife Association. As mentioned previously in this proposal, outdoor education and experiences are conducive to important research in youth wellbeing. The research community is reporting that better understanding of youth wellbeing in the COVID and post-COVID era will be crucial. According to available metrics, attendance, and participation in outdoor related activities (parks, nature trails, boating, hunting, fishing etc.) have grown exponentially during the pandemic. The Thomas Ranch is equipped to deliver on most of these activities people have been seeking during challenging times. In this respect, Texas A&M University/Texas A&M AgriLife could deliver the “retreat” that Mr. Thomas envisioned for future generations. Below are some short and long-term programs The Thomas Ranch could host.

Short-Term.

- Wildlife Habitat Education Project is an interactive program that teaches youth about wildlife, habitat, habitat management, and natural resources stewardship. In addition, life skills such as teamwork, critical thinking, public speaking, and observation are underlying objectives in this youth development effort.
- The Thomas Ranch has multiple stocked ponds allowing for sportfishing and aquatic science field days and multi-day camps for youth groups and families.
- Hunting is a multibillion-dollar industry in Texas. The need for hunting education and hunter’s safety has never been greater. The Thomas Ranch boasts covered areas for classroom instruction and a true natural environment for field training.
- The Thomas Ranch borders the Sam Houston National Forest and possesses over hundred acres of pine timber. The ranch could host youth Forestry Field Days in collaboration with Texas A&M Forest Service.
- Mr. Thomas was committed and passionate about soil and water conservation. He served on numerous state and national committees/boards charged with conservation. A youth Soil and Water Conservation Field Day at the ranch would align perfectly with one of his greatest pursuits.

- The Texas 4-H Water Ambassadors Program provides high school youth an opportunity to gain advanced knowledge and develop leadership skills related to the science, technology, engineering, and management of water in Texas. The Thomas Ranch could immediately host a portion of the multiday training.

Long-Term.

- The Thomas Ranch landscape ranges from open grassland to Post Oak Savannah and Piney Woods. The ranch would be ideal for creating nature, off-road biking, and horseback riding trails. Programs and field days could be delivered in each of these project/activity areas.
- The Piney Woods portion of The Thomas Ranch would offer a fantastic site for an interactive 3-D Archery Trail. Students would traverse the woods and shoot 3-D targets positioned along the trail in competition or recreation.
- The topography of The Thomas Ranch permits the safe operation of a sporting clay facility and rifle range. The sporting clay and rifle range would primarily support youth shooting sports education and competition. Further, these features would add tremendous value from an adult perspective as it relates to recreation and retreat for conference events that are being proposed by the collective Thomas Ranch Task Force.

Activity Five - Timberland Production and Research Report. Dr. Bill Oates (TFS)



BILL THOMAS RANCH

The Thomas Ranch will be utilized by Texas A&M University under the leadership of the College of Agriculture and Life Sciences and Texas A&M Agrilife for teaching, research and extension on: Ecosystems Science & Management, Animal Science, Wildlife Management, Horticulture with an emphasis on Viticulture, **Forestry**, and more.

Timberland recommendations for the ranch include:

SMALL “WOODLOT” DEMONSTRATION AREA

- Prescribed Burning for Vegetation Management
- Wildlife Habitat Management Practices
- Best Management Practices for Soil and Water
- Selling and Harvesting Timber
- Reforestation and Stand Improvement
- Woods Road Design, Layout, and Construction



“OUTDOOR CLASSROOM” OPPORTUNITIES

- Nature Trails
- Observation of Forest Ecology and Forest Management
- Potential Site for Eagle Scout Projects
- Collaborative Relationships with Local Public Schools
- Conservation Versus Preservation
- Encourage Careers in Forestry and Natural Resources
- Promote the TAMU Brand

POTENTIAL RESEARCH INITIATIVES

- Carbon Storage/Climate Change
- Agroforestry
- Human Dimensions and Health
- Conversion to Forest Cover



Additional Opportunities for the Thomas Ranch

The Texas A&M AgriLife Digital Agriculture Research and Extension Center.

Partnerships between AgriLife (Research, Extension, COALS and Forestry), TEES and Technology Companies (Intel, Microsoft, ORACLE).

Research Programs and Faculty (Research/Extension appointments as appropriate)

1. Digital Agriculture (3FTEs, A faculty from this group will serve as Center Director)
 - Plant physiologist/cropping systems (S&C)
 - Sensors/robotics/connectivity Engineer (BAEN)
 - Computer Engineer/data management/machine learning (TEES)

2. Livestock production systems (2 FTEs)
 - Animal nutrition/systems (AS)
 - Pasture management/cropping systems/carbon sequestration (S&C)

3. Horticulture (2 FTEs)
 - Viticulture/orchards (HORT)
 - Vegetables production (HORT)

4. Extension and Outreach (1 FTE)
 - 4H, Ag. Communication

Total 8 FTEs (estimate yearly budget \$2.0 M)

Infrastructure and one-time expenditures (Total = \$14.0 M), itemized as follows

- Seed funds to faculty for equipment (8 x \$250,000 = \$2.0 M)
- Another farm/lab equipment (\$2.0 M)
- Land/Cattle) (Thomas Ranch, self-sustaining)
- Additional Office, Lab. Space 30,000 Sq Ft. (\$8.0 M)
- Greenhouses (8x \$250,000 = \$2.0 M)

Research Areas for a Digital Agriculture Research and Extension Center.

Main focus: Automation/Expert Systems—Deployment of precise, accurate and field-based robots equipped with sensors to collect information in real time to visualize changing

conditions and respond automatically with interventions that reduce risk of losses and maximize productivity.

Research Areas:

- Robotics, Unmanned Aircraft Systems (UAS) sensor technology to monitor crop growth, biotic and abiotic stresses (disease, nutrients, water stresses)
- Near real-time Crop simulation to forecast crop performance and explore best management options
- Spaceborne remote sensing (satellite) technology for large area estimation of crop performance.
- Integrating machine learning (artificial intelligence) capabilities with other components – crop simulation, UAS and spaceborne remote sensing, agriculture domain expertise
- Deployment of precise, accurate and field-based sensors to collect information in real time to visualize changing conditions and respond automatically with interventions that reduce risk of losses and maximize productivity.
- Integrating social economic stakeholders' concerns to the system

Technology can be readily modified to fit agronomic crops (cotton, sorghum, corn, wheat, soybean, forages, etc.) and horticulture crops (grapes, tomato, potato, leafy greens, peppers, melons, etc.). In addition, systems that include ruminant food animals (beef and dairy cattle, sheep, and goats), non-ruminant food animals (swine), and companion animals (equine) all need advancements in this technology.

Main Research and Extension programs:

- Integrated cattle/pasture digital monitoring/management system,
- Integrated Viticulture/Orchard Digital monitoring/management systems,
- Smart vegetable production systems and
- Outreach and education program for all the above.

Challenges and Opportunities:

- Challenges – Building transdisciplinary teams (biologists, socio-economists, engineers, and computer scientists). Sustainable intensification, Soil degradation,

global climate change, water scarcity, land use, animal products and human health, antibiotics use and antimicrobial resistance, preservation of biodiversity, animal welfare.

- Opportunities - the integration of “big datasets” to improve the resiliency and efficiency of agriculture production systems. Nutritional and feeding opportunities, Rediscovering the grazing ruminant through regenerative livestock agriculture, early nutritional fetal programming, selection strategies for efficient meat production, rumen efficiency and rumen microbiome, early warning systems, precision livestock farming, nutrition modeling and artificial intelligence (decision support systems).
- Opportunities - Develop mutually beneficial partnerships with technology companies (Microsoft, Intel, ORACLE), industry to attract urban and rural communities to agriculture

Outcomes:

- Advanced, machine-learningbased high throughput phenotyping system
- In-season (satellite-based) large area prescription management (automation) and yield forecast systems
- Educational and outreach systems for K-12 to college education programs
- Precision livestock farming, nutrition modeling and artificial intelligence (decision support systems).

Barriers:

- Large initial investment
- Fundamentally change how financial resources are allocated to research
- Developing functional (win-win) relationships with technology companies and industry.