



TEXAS TECH UNIVERSITY  
Masters of Public Administration<sup>T</sup>



THE TEXAS LYCEUM

# POLICY BRIEF

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## STEWARDSHIP IN OUR BUSINESS:

AGRICULTURAL PRODUCTIVITY,  
GROWTH, RESILIENCE, AND  
ECONOMIC TRANSFORMATION IN  
THE TEXAS PANHANDLE

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## Policy Recommendations



Invest in  
Regenerative  
Agricultural  
Practices for  
Producers



Make  
Healthcare  
More  
Accessible to  
Producers



Provide  
U.S. Farmers  
and Ranchers  
Access to  
Quality Rural  
Broadband



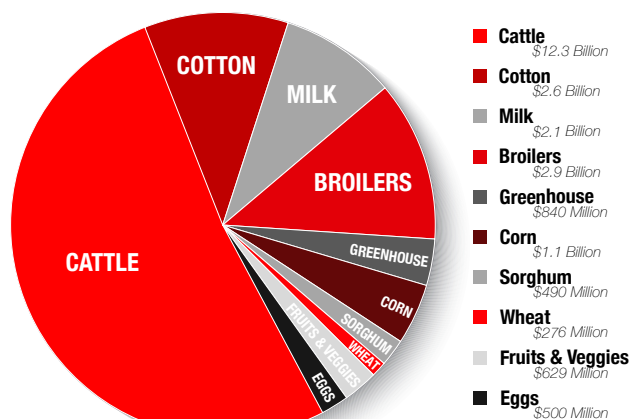
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## 1 Introduction

Texas leads the nation in the total number of farms where the state has near 74% (127 million acres) of the land in agricultural production (Hundl 2021). While primarily driven by the cattle industry, important crops to the state include cotton, corn, wheat, and sorghum. The Texas panhandle, comprised of 26 of its northernmost counties, concentrates the majority of the cattle population, providing an important foundation for the economy and livestock productivity of the region. Across the state, the Texas Department of Agriculture (TDA) (2022) reports that one-in-seven working Texans (14% of the state's population) is employed in an agriculture-related job.

While enduring a changing climate, they are charged with adapting their practices and accommodating a growing population. Issues of sustainability in this industry are not limited to agricultural practices in the field: "The average age of Texas farmers and ranchers is 59 years" (TDA 2022). Accounting for the demographic trends of producers is critical, as this group of less than two percent of the population is responsible for feeding and clothing Texans (Texas Farm Bureau, 2022). Understanding strategies and technologies that will make agriculture more efficient, productive, profitable, and safe is critical to the future of food across Texas. As such, this policy brief examines three big challenges in Texas agriculture that decision-makers can engage to support farmers and ranchers: water and food production, producer demographics, and rural connectivity. Finally, it provides recommendations for policymakers and advocates interested in the opportunities and complex

**Top Texas Commodities from the Texas Department of Agriculture (2022)**



## 2 Overview of Agriculture Sector in Texas

Texas' top commodity agriculture products include Cattle, Cotton, Milk, and Broilers). The cattle industry dominates the economic market, where the panhandle region is especially productive. An estimated 42.74% of Texas' dairy cattle production may be found in the 26 counties that make up the panhandle. Texas leads the nation in cattle inventory, followed by Nebraska, Kansas, Oklahoma, and California (USDA-NASS Texas Field Office 2021). Mexico and Canada, along with increasing markets in China and Asia, sustain the demand for beef exports. Texas ranks fifth, behind California, Wisconsin, Idaho, and New York, in dairy production, and the industry is expected to continue to grow, especially in the Texas Panhandle where we now see approximately 80% of the state's dairy production (Minton 2021).

This region's wheat production comprises over 37% of the state's supply. The Texas Wheat Producers (2018) estimate that fifty percent of Texas' wheat is sold on the foreign marketplace, with much of this region's wheat harvest sufficient for breadmaking. The Panhandle contributes

near 26% to the state's corn (grain) harvest, which is substantial when we consider that the highest concentrations of corn output nationally are found in the Heartland region (Figure 5). Sorghum grain production is productive in this region, contributing over 19% of the state's harvested acreage. Sorghum grain is "important for beef cattle, the feed lot industries, and poultry", and sorghum also has a role in rotational planting and invasive mitigation plans (Smith and Anisco 2000).

### TRENDS

The Texas agricultural landscape is changing. "Texas working lands, or privately owned farms, ranches, and forests, are under increasing land conversion pressure", resulting in a fragmentation of agriculturally productive areas that produce food and fiber (Texas A&M Natural Resources Institute 2020). Fragmentation is coupled with climate change, and the negative impact it has on Texas farmers and ranchers is significant. In a changing climate, they can expect smaller, less productive, unhealthy cattle, and a fifty percent decline in crop yield where they would no longer be able to irrigate (USEPA 2016). The health of this aging group of workers in a volatile environment need also be considered. Tackling challenges in water and food production, producer demographics, and rural connectivity in Texas will require synergistic efforts between policymakers and producers.

### An Overview of Agriculture in the Texas Panhandle

Texas Panhandle Counties (26)	Farms (number)	Land in Farms (acres)	Beef (# Cattle)	Milk (# Cattle)	Cotton (Harvested Acres)	Corn (Harvested Acres), grain	Wheat (Harvested Acres)	Sorghum (Harvested Acres), grain
Panhandle Total	8,157	15,201,075	248,500	267,100	528,300	581,600	742,570	359,740
Texas Total	247,000	126,000,000	4,475,000	625,000	5,566,000	1,850,000	2,000,000	1,870,000
% of Texas Total in the Panhandle	3%	12%	6%	43%	9%	26%	37%	19%

**Note:** Farm and land in farms information from the USDA's National Agricultural Statistics Service (USDA-NAAS) 2017 Census of Agriculture Volume 1, Chapter 2: County Level Data. County crop and livestock totals are from the USDA-NAAS Texas Field Office most recently available Texas County Estimates (2018-2020). Panhandle totals and percentages may be higher than estimated, as values reported by producers within each of the 26 counties may be withheld to avoid disclosing data for individual farms.

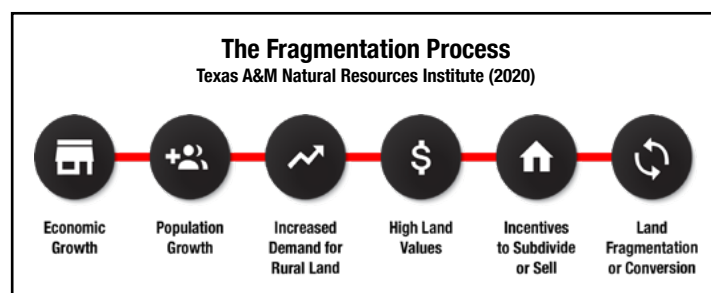


## Big Challenges in Texas Agriculture

Food security for a growing population in a rapidly changing climate in a rural agricultural economy requires attention to three issues challenging Texas producers today: water scarcity and its impact on food security, the aging and changing demographics of the farming and ranching population, and the provision of rural broadband connectivity to drive data driven decisions and advance agricultural production methods. A synergistic approach is necessary for farmers and ranchers to best meet these and the many challenges that we will confront in a more populated and globally interconnected world.

reproductive patterns of herds, leading to a disadvantaged selloff for farmers and ranchers. This is, unfortunately, a better scenario than what could be expected with persistent limited water and high heat. In-field livestock death and reduced crop yield could be expected to increase in a water scarce environment, jeopardizing the food supply chain.

In the absence of widespread intervention in agricultural water management, it can be expected that rising on-farm costs will be passed on to the consumer. This will further compound issues related to food access and affordability in economically strained populations. Food insecurity, defined by the USDA as, “a lack of available financial resources for food at the level of the household”, currently impacts 13% of Texas households, or 1 in 8 Texans (Feeding Texas 2022). Water scarcity will play a key role in the future of food security in Texas.



## The Aging Agricultural Workforce: Output in Peril

An aging agricultural workforce without sufficient transitional support threatens food security while erasing institutional knowledge about agricultural practices in Texas fields. While the state leads the nation in the number young farmers, understanding changes and inter-generational shifts in farming participation is needed (Halvorson 2021). Incentives that tackle barriers to entry and inhibitory obstacles, such as the debt load and high cost of machinery and land, will be necessary as the population reliant on Texas producers grows. It is imperative that the output and integrity of the West Texas food supply chain remains secure and transitions towards sustainable practices in a changing global environment.

The physical demands of agriculture become increasingly hazardous as this population continues to work. Health and safety risks to an aging agricultural workforce are of major concern, as it has been reported that half of all farming deaths involve workers over 55 years old (Hernandez-Peck 2001). In an inherently dangerous and challenging environment, moving on or off equipment, chemical exposure, loud and outdoor sensory risks, and large animal interactions all pose unique physical challenges to the health and safety of an older workforce. As the average Texas farmer is reported to be 59 years old, it is imperative that the state address the needs of aging producers.

The comparative output of an aging workforce need be a key topic as we work to feed a growing population. As could be expected with many occupations, productivity peaks at the mid-life of farmers, however, the diminished return of older farmers puts agricultural output in peril: “If older farmers had not experienced decreases in productivity, U.S. agricultural output in 2012 would have been 5.66 percent greater” (Tauer 2017). While new technologies may provide an environment for farmers to stay on longer and potentially increase their productivity, it will be necessary to brace for generational changes in agricultural output.

Acceptance of this challenge will require an understanding of the changing population demographics in West Texas. “Nine of Texas’ top 10 most agriculturally-productive counties are in the Texas Panhandle: Castro, Dallam, Deaf Smith, Hansford, Hartley, Lamb, Parmer, Sherman and Swisher. Even as the Lone Star State saw explosive population growth over the past decade, those counties lost residents at a rate of 3.9 to 11.2%” (Whitlock 2022). This leads to a smaller workforce available to rural producers and can further strain their operations while they incur higher costs. Moreso, the exodus of family members in favor of opportunities in the state’s urban centers may reduce the likelihood that one would have the ability to pass on the family farm. Trends towards fragmentation are also a reflection of the rural-urban land use shift: “While these lands are directly converted to development, millions of additional acres—including many large properties that have been family-owned and operated for generations—are beginning to feel the squeeze of a larger demand for rural lands for nontraditional uses” (Wilkins et al. n.d.). That the Texas agricultural workforce as a whole shrinks and ages while larger farming operations fragment challenges the state’s production of food and fiber.

## Water Scarcity: Food Security

‘Pray for rain’ is a cultural call to attention in West Texas. Rural farming communities understand the serious impact that drought has on farmers and ranchers. With the devastating 2011 drought as a comparative measure, farmers are struggling more today as widespread drought hits in a time when underground moisture seems nonexistent (Lozano 2022). This impacts food and fiber production through changing water patterns, diminished crop and livestock hardiness, and results in financial strain on producers and food insecurity for consumers.

The population as a global trend, where we can expect near 9.7 billion people on earth in 2050, is something that an agricultural economy needs to brace for (United Nations, 2019). Between 2010 and 2020, Texas’ population growth rate was double that of the national population, and while much of this was along the I-35 corridor, issues in water resource management are regionally pervasive (You 2021). Industrial and domestic competition for water will continue to pressure the relationship between rural and urban use as increased requirements in agriculture grow to match the needs of a larger population.

Drought and shifting rainfall patterns due to global warming will necessitate change in the future of Texas agriculture. Of concern is the status of the Ogallala aquifer, which supplies much of the agricultural activities of West Texas. Lack of groundwater recharge coupled with dryer soils challenges producers and presents a unique threat to long-term food security. Additionally, farmers and ranchers may be required to adapt to changing growing patterns and seasons. While there will be an acclimatization to the water and nutrient requirements of different livestock and crop varieties, growers will also need to prepare financially to change expensive equipment and implements used for planting and harvest.

On the land, an inability to grow feed or cultivate pastureland for livestock could significantly stress producers. The water cost associated with large animal operations is often overlooked as part of the consumer product but is all too real for ranchers in times of exceptional drought. In 2022, Lubbock ranchers report being forced to position themselves to “sell their cattle earlier this year because of a drought that is making it more expensive to feed them” (Perry 2022). Short grass limiting grazing patterns, coupled with high feed prices, stunts the growth and

Beginning farmers, those practicing less than 10 years, face significant financial barriers to entry in high startup costs and lack of available land for purchase or rent (Ahearn and Newton 2009). Texas' young (age 35 or less) and beginning farmers face additional challenges as they work to establish themselves financially and geographically while overcoming gaps in institutional knowledge of practice in the field. In a changing climate, their work is an exponentially difficult task that necessitates a transition towards a system that prioritizes the workforce and a sustainable food supply system.

## ➤ Broadband Connectivity: Growing the 'Broadband Prairie' to Include West Texas Agriculture and Rural Communities

Texas rural populations represent approximately



of all Texans without broadband access.

To support a younger, new, and more diverse group of producers while protecting the health and boosting the longevity of aging farmers and ranchers in a more extreme climate, advanced technologies and broadband connectivity in rural Texas is necessary. Increased rural connectivity in Texas farming populations will provide producers the ability to make more efficient, data-driven solutions in a quickly changing climate and landscape. In West Texas, growing the "Broadband Prairie" (Krapfl 2022) will be to expand affordable, universal, and high-speed internet coverage

across counties to include its rural and agrarian populations.

The digital divide in the Texas Panhandle and rural communities is concerning in that access to the internet is longer identified as a luxury, but rather as a necessity. During the 87th legislative session, Texas Governor Gregg Abbott declared broadband access as an emergency item, and has since established his Governor's Broadband Development Council in an effort to expand connectivity (Office of the Texas Governor 2022). This comes as a move out of necessity for rural communities, where it was reported by Connected Nation (2020) that, "Over 440,000 of the half-a-million households statewide that lack access to broadband service, or 86% of Texas households that lack broadband access, are rural". Overcoming the funding and infrastructure obstacles that keep rural communities disconnected will be necessary to advance agriculture at the pace that will be needed to support those dependent on the agricultural economy of the region.

The composition of Texas producers is diversifying. In the time since 2012, there has been an increase of 69% in the number of female producers in the state, and a young producer averages to 29 years old (Texas Department of Agriculture 2022). Access to broadband and associated agricultural technology can be a potentially significant contributing factor to the success of new and young farmers and ranchers. Technology may provide a bridge to overcome the institutional knowledge gap this new generation faces alongside an aging agricultural workforce. This new group brings technical expertise and innovative problem-solving skills to West Texas agriculture where they may further amplify their talents as they incorporate technology as part of their in-field practice. There is a quantifiable and positive impact that connectivity has on Texas farmers and Agribusiness, where a 6% increase in revenue can be expected by farmers that have broadband access (Connected Nation 2020). Connection between the farm, food system, and consumers outside their typical serving area result is a profitable economic opportunity for producers.

Access to broadband may enhance precision farming techniques and work to reduce the expenses on limited resources, such as water, and losses on expensive chemicals, livestock, and weather sensitive produce.

More precise and accurate monitoring of field conditions while farmers are away, home, or unable to get to the field due to illness or inclement weather, works to alleviate the immediate demand on producers to assess conditions while providing them the opportunity to make data-driven decisions, improving the quality of life and enhancing safety measures for rural producers.

## 4 Policy Recommendations

Water scarcity and its impact on food security, the aging and changing demographics of the farming and ranching population, and the provision of rural broadband connectivity are currently state-wide and legislative priorities. These issues transcend political parties and require an attention to the needs and future of West Texas farmers and ranchers. This is encouraging as we transition into comprehensive policy solutions where a synergistic approach is necessary to start making the big changes needed, here and now.

### Invest in Regenerative Agricultural Practices for Producers



West Texas producers endure more severe drought and weather patterns than they have in the past while being asked to produce more for a growing population with a globally interconnected food system. They are in the field, doing the work, and policymakers must show up to put support in place for their sustainable and resilient practices, even when it means their transition away from what has historically been practiced. Farmers may need to make difficult decisions about which crops they have the water capacity to plant and irrigate, and in the event of a transition away from irrigation and traditional crop varieties, will need to be assured that their conservative efforts will not devastate their business. This means that financial resources need to be made readily available for farmers to plant what works best on their farm during that season, providing for their flexible and intuitive planning needs. Integrative crop and crop-livestock rotational systems could work to restore the agroecosystem and pastures of West Texas. Innovative policymaking requires the provision of funding for farmers that transition towards and use regenerative agriculture techniques, and for ranchers to let their pastures rest and restock with native grasses. This would be a step towards building soil water-retention capacity while bolstering the grazing and growing environment. These processes take time. Implementing policies that support the long-term vision of a resilient agrarian system for West Texas farmers and ranchers is a smart investment in Texas agriculture.



### Make Healthcare More Accessible to Producers

Farmers have experience and expertise in the agricultural health of their soil, crops, livestock, and the organisms supporting a viable agroecosystem. They face the most severe conditions from changing climate (Ellfeldt 2021) while poised to be the ultimate driving force behind solutions to meet the challenges ahead (Terry 2019). Policymakers must recognize that the productivity of this entire agroecosystem and our collective ability to adapt to a changing climate hinges upon healthy farmers and ranchers. State provided health benefits would ensure that Texas producers have the medical resources they need without their incursion of additional expense or debt. It is a quality-of-life issue for an aging population, and could be a way to incentivize young people to reconsider a move away from rural areas in Texas to get them back on the farm. West Texas agriculture is a physically demanding and often dangerous industry, while its practice is gently centered in family and communal values, including taking care of one another. The physical



health and well-being of producers at a time when an aging workforce transitions alongside a growing new and young farming population need be a healthcare policy priority in support of Texas farmers and ranchers.



## Provide U.S. Farmers and Ranchers Access to Fast, Affordable, and Reliable Broadband

Infrastructure investments in rural West Texas broadband development will put producers in a position to meet 21st century challenges in a changing environment. As previously mentioned, the actions of Governor Gregg Abbott and his Governor's Broadband Development Council are important legislative moves towards the provision of equitable internet services across Texas. The Council cites cost, as part of the economics of density, as a main barrier to broadband access for rural communities. As a matter of equitable access to a modern-life necessity, the state needs to work actively with the federal government, across politics and party lines, to ensure that the region has broadband access comparable to that of the I-35 corridor. In the short-term, policy could focus on bringing WiFi to the most underserved pockets in rural Texas communities. The Hidalgo County Public WiFi Project, a product of need and federal Covid-19 relief funds, serves as an excellent template for what could become essential and inventive public policy to close the digital divide (Wiseman et al. 2021). A collaboration between Hidalgo County with the companies Insight and SmartWAVE provided WiFi and internet access to over 30,000 students and teleworkers using hardware that, "leveraged as much existing infrastructure as possible - water tanks, light and telephone poles - to expedite services delivery and control costs" (Insight Public Sector 2022). For rural, agricultural communities in West Texas, this could be a way to work towards digital equality while directly and immediately supporting farmers and ranchers as they work in the field and engage with new, innovative technologies.



## 5 Moving Forward: Conclusion

Designing public policy to match the resilience of Texas growers requires long-term, forward-thinking commitments to address challenges in water scarcity, producer healthcare, and rural broadband access. Our neighbors in agriculture are responsible for a large sector of our state economy, produce our food and fiber, and they have a significant influence on how all of us will live in a changing climate. It will be essential for policymakers to implement innovative solutions to overcome these challenges with the same level of grit and determination as we see in Texas farmers and ranchers.

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