

## Article

# Texas in Transition: Considering the Production of Grapes, Wine, and Place

Colleen C. Myles <sup>1,\*</sup>, Christi G. Townsend <sup>1</sup> and Kourtney Collins <sup>2</sup>
<sup>1</sup> Department of Geography and Environmental Studies, Texas State University, San Marcos, TX 78666, USA

<sup>2</sup> Independent Researcher, Austin, TX 73301, USA

\* Correspondence: cch64@txstate.edu; Tel.: +1-916-709-0703

**Citation:** Myles, Colleen C., Christi G. Townsend, and Kourtney Collins.

2022. Texas in Transition:

Considering the Production of

Grapes, Wine, and Place. *Social*
*Sciences* 11: 488. [https://doi.org/](https://doi.org/10.3390/socsci11100488)

10.3390/socsci11100488

Academic Editor: Nigel Parton

Received: 21 July 2022

Accepted: 25 September 2022

Published: 19 October 2022

**Publisher's Note:** MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



**Copyright:** © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

**Abstract:** Given the state's growing prominence in the United States wine industry, paired with its relative obscurity, we explore the cultural and environmental transformation of the state of Texas from the perspective of the booming wine industry. Using a qualitative, narrative approach, focused on the two largest and most productive appellations in the state, we form a framework for understanding the historical and contemporary context for wine in Texas. Through participant observation and targeted interviews with growers, winemakers, and other wine industry insiders, we uncover how wine has become a major part of the regional identity of the Texas Hill Country and High Plains. We find that, even though the best wines made in Texas are made from lesser known and harder to market varietals, Texans have embraced the wine (culture) produced in their state. Though, as elsewhere, the industry in Texas is complex and multifaceted, it is still evolving, and industry actors are focusing on making a high quality, tasty product in order to compete with other wine industry giants. Although growers in the Hill Country and High Plains face various challenges, these circumstances demand creativity. However, the challenging circumstances and accompanying creativity are precisely what drive the unique tastes of Texas wines, a reality the Texas wine industry has begun to embrace.

**Keywords:** wine; culture; cultural landscape; place; fermented landscapes; Texas

## 1. Introduction

### 1.1. Fermented Landscapes

Ferments have been a part of human life and society since the Neolithic age; humans would not be who they are if they had not discovered how to preserve and enrich their food supply, including embracing both the utility and delights of active fermentation. Fermenting grains and fruits is a way of ensuring food safety, enhancing nutrition and flavor, and connecting socially and spiritually to each other (Phillips 2014). The availability of the constituent materials for such ferments requires particular forms of agricultural production, which influences what is grown where and when. Broadly speaking, as with any agricultural product, the form and scale of production clearly has impacts on the local landscape. Moreover, the array of influences—environmental, social, and economic—that fermentation-focused tourism has on the landscape is increasingly clear (Slocum et al. 2018).

There is increasing recognition that the agricultural production of fermented products has an even greater impact than other forms of agriculture insofar as the cultural and economic ramifications extend beyond physical and environmental transformation into the realm of social and symbolic change (Myles 2020). “Wine country” cannot thrive without a network of related services, being proximate to other compatible recreational activities, and having a ready population of potential customers nearby (Myles and Filan 2019). Although the special mix of elements needed for a fermentation-focused region to thrive

is still being explored (Overton 2020), such regions have nevertheless (already) been valorized and actively pursued by local and regional policy makers (Myles et al. 2021).

In this chapter, we explore the cultural and environmental transformation of fermented landscapes (Myles 2020) in the state of Texas, with a focus on the wine industry and how it has changed the landscape in the High Plains and Hill Country, the two largest and most productive appellations in the state. Through targeted interviews conducted with growers, winemakers, and other wine industry insiders, we seek to form a framework for understanding both the historical and contemporary context for wine in Texas and the major transitional moments that have occurred as the Texas wine industry has developed. Although not the largest in the United States in terms of grape and wine production (California is the leader), consumption (California, by volume; Idaho, per capita), or number of wineries (also California), the recent growth of the Texas wine industry has nevertheless been astounding. Texas is currently the fifth largest producer of wine by volume (Willcox 2021). Further, the landscape of Texas as a whole has evolved over the past decade, including a years-long trend of rapid population growth (Ashcraft 2022), and we explore whether and how this evolution has resulted, at least in part, from the growth and development of the various aspects of the wine industry within the state.

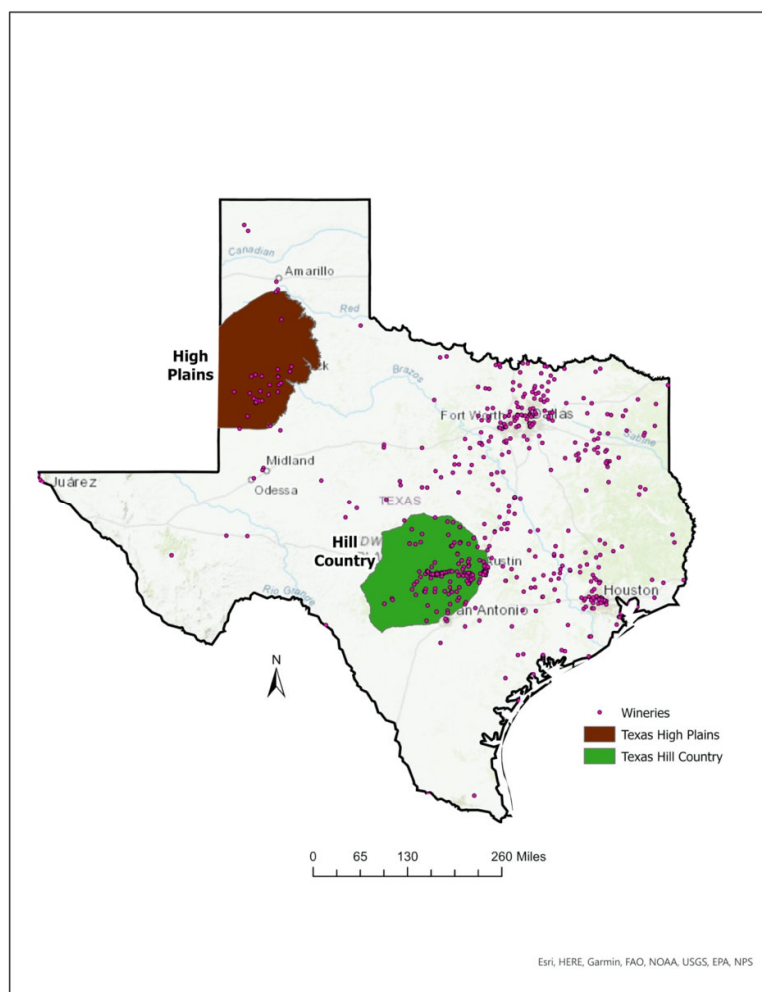
## 1.2. Site and Situation

Stephen F. Austin, the “Father of Texas,” once said: “Nature seems to have intended Texas for a vineyard to supply America with wines”. With a land area of 692,405 square kilometers, Texas is the largest state in the lower 48 contiguous United States, a fact that Native Texans are delighted to share with any non-Texan who is willing to listen. The popular expression, “Everything is bigger in Texas” captures both the literal and metaphorical vastness of the state, and is often used to describe anything from distances between cities (the westernmost city of El Paso is actually closer in distance to San Diego, California than it is to Texas’ largest city, Houston), to the size of the state capitol building in Austin (larger than the United States Capitol building in Washington DC), and to the enormity of Texas pride felt by state residents. Those connected to the wine industry in the state are similarly self-relational and (appropriately) full of pride in what they have been able to accomplish in a relatively short period of time. Industry insiders and affiliates have worked enthusiastically to make wine production in the state competitive with other top producing (and consuming) states. Every new year, from budburst to harvest, and from fermentation to bottling, renews the industry’s energy for improving quality and gaining recognition.

Even though viticulture is not entirely new to Texas, the modern industry is relatively young compared to more well-known grape-producing states, such as California and Oregon. There are eight American Viticultural Areas (AVAs) in Texas, the oldest of which was established in 1985, the newest in 2005: Mesilla Valley, Bell Mountain, Fredericksburg in the Texas Hill Country, Escondido Valley, Texas High Plains, Texas Davis Mountain, and Texoma. Although most vineyards in Texas are located in an AVA, not all are. The viticultural areas examined in this chapter are relatively recent additions to Texas; the Texas Hill Country viticultural area was established in 1991 and the Texas High Plains AVA in 1993. As of 2020 (the most recent data available), Texas had almost 5140 acres of land planted in wine grapes; the vast majority (3140), are in the High Plains, with the Hill Country holding the next largest sum of bearing acres (790) (USDA 2020). However, it is important to note that wineries (and tasting rooms) do also exist outside of the boundaries of any AVA (Figure 1), with most of those located in Texas’ largest cities (Dallas/Fort Worth, Houston, San Antonio, and Austin).

The High Plains AVA is located in north Texas (in the vicinity of the Texas Panhandle and the *Llano Estacado* or “staked plains”), adjacent to New Mexico (to the west) and south/west of the Oklahoma border. This is where the greatest quantity of wine grapes are grown. The relatively warm climate of the state is conducive to the production of mostly red grape varieties and thus, the High Plains agricultural region produces mostly

Cabernet Sauvignon, Merlot, and Tempranillo, with 26 percent of production in white wine grapes. The Hill Country AVA is located in central Texas, west of Austin and north-west of San Antonio. It is here where the wineries—and the tourism that accompanies them—are in (relative) abundance. The Hill Country AVA also produces red wine grapes, but on a smaller scale, including Tempranillo, Cabernet Sauvignon, and Mourvedre, with 16 percent of production in white wine grapes (USDA 2020).



**Figure 1.** Map of Texas Wineries with the High Plains and Hill Country American Viticultural Areas. (Map by AUTHOR and Nathaniel Dede-Bamfo; September 2020).

## 2. Materials and Methods

The study rests on a qualitative, applied, narrative approach, augmented by key informant interviews and a review of primary data. Author Collins is an industry insider, a winemaker in the Hill Country and also a board member for one of the state's two wine industry organizations. As such, in addition to years-long participation and observation, as well as a comprehensive review of primary data (production statistics, industry literature, etc.), seven key informant interviews were conducted over a period of three months with growers, winery owners, and wine educators who have been involved in the wine industry in some way over the last decade to understand how the industry in Texas has evolved. Our examination and analysis of relevant primary data, paired with the qualitative interview and (participant) observation data, allowed us to create a timeline for the major transitions that have occurred in Texas viticulture and winemaking, which

provided a base of reference for interview discussion. Interviewees were selected based on several factors, including but not limited to their length and breadth of experience in the industry as well as their ability to represent multiple wineries or vineyards such that we could obtain insights about the industry and wine landscape as a whole, rather than the perspectives from just a few individual businesses or growers. Accordingly, the unstructured interviews were geared towards each of the interviewees' individual areas of expertise, while encouraging them to offer insights about the industry more broadly.

Our results provide an analytical synthesis—presented in the form of an exploratory narrative of the history, present, and future of wine in Texas—of our various methodological approaches and findings.

### 3. Results

#### 3.1. *The Evolution of Texas Wine and the Major Transition Moments*

##### 3.1.1. Prehistory and Early Attempts

Texas has more indigenous grape species than any other location on Earth, including fifteen (of thirty-six) species of the genus *Vitis* (Johnson and Robinson 2007). Before the arrival of Europeans, indigenous peoples harvested and consumed these grapes, which grew prolifically in many parts of Texas, particularly near rivers and streams where the native vines climbed the trees of the riparian landscape (McEachern 2003; Kane 2012).

Wine has been produced to some extent in Texas since the 1600s, with the arrival of Spanish (Franciscan) missionaries. It is generally accepted that the first vineyard in Texas was likely established at the Ysleta Mission, near the Rio Grande River in “El Paso del Norte”, or what is now El Paso, the most western city in Texas. These ‘Mission’ grapes were cultivated to make sacramental wine, and thus quality or flavor was not necessarily as important as utility (Kane 2012). Eventually, more European (mostly Czech, German, and Polish) immigrants would arrive, and they attempted to plant vineyards throughout what is now south and central Texas; cultivating *vinifera* cuttings brought with them from their homelands.

The first successful attempts in commercially viable viticulture occurred at the turn of the 20th century. By 1919, there were at least fifty working wineries in Texas and 3000 cultivated acres of vineyards (Kane 2018), however all were forced to cease operation with the ratification of the eighteenth amendment to the United States constitution. The Volstead Act, more commonly known as *Prohibition*, decimated the emerging wine industry, leaving just one winery that survived to the present day: Val Verde Winery, located in the city of Del Rio on the United States-Mexico border, was founded in 1883 and sustained during Prohibition by grapes and wine destined for communion (Kane 2012). Even today, the last vestiges of prohibition are still present—as of 2018, Texas had five counties where the sale of alcohol remains illegal (Marks 2018).

Thomas V. Munson, a Texan, horticulturist, and prominent historical figure in the world of viticulture, is widely considered the “father of Texas grape culture”. Munson worked with both native and cultivated grapes adapted to the warm southern United States (Perry and Bowen 1974) and is celebrated by many in the global wine industry for his help in restoring French vineyards after the devastating phylloxera outbreak of the late 19th century by the provision of phylloxera-resistant American (Texan) rootstock. It was not until after Munson's death—and the repeal of Prohibition in 1933—that anything of significance in terms of innovation in viticulture occurred in Texas (Perry and Bowen 1974). Viticulture of wine grapes did not return on a significant scale until the 1970s when researchers at the major Texas universities (Texas A&M University, Texas Tech University, and the University of Texas) began experimenting with test vineyards, finding that some grape varieties, mostly French-American hybrids, could grow successfully in the warm and arid regions of Texas.

### 3.1.2. Tracking the Transition from Nascent to “Emerging”

The industry in Texas has experienced considerable, near-explosive, growth in the last three decades. Only one commercial winery existed in Texas in 1975 (Morse 1990), and, in 2008, there were 280 (MKF Research 2008). Today, there are more than 775 (TABC 2022). The nascent wine industry (post 1970s) was primarily located in Lubbock, Fredericksburg, Fort Worth, and Fort Stockton, which were areas considered to be at a lower risk of Pierce’s Disease, a plant disease which was—and remains—prevalent throughout the state. Pierce’s Disease, arguably the greatest disease hazard to grapes in Texas, is caused by a bacterium, *Xylella fastidiosa*, and is transmitted to vines by insect vectors, primarily the Glassy-winged Sharpshooter. The disease has been known to cause significant losses in many Texas vineyards (Kamas 2010; Townsend 2012). High humidity (a common weather element in central, east, and south Texas) and location near to a body of water, puts vines at an enhanced risk. Cooler temperatures, higher elevations, and aridity are geographic factors which help limit its spread.

Despite the challenges Pierce’s disease presented, industry actors were committed to grape growing in the state, and, so, intensive research began to find the causes of the disease, how it spreads, and how to stop it. Although securing funding for the research was not easy, researchers report: “In the last decade we have made enormous scientific strides in our understanding of the disease and in our prevention of its spread” (Kamas 2010). These findings help guide vineyard establishment by offering guidance in terms of what to plant and where, and how vineyards should be managed so that the disease can be mitigated.

Texas wine has come a long way, but especially so in the last five years, as the state’s grape production and winery growth have accelerated. Today, growers, winemakers, and winery owners come from a variety of diverse backgrounds. Some grew up in farming communities and have extensive experience in agriculture, often growing crops other than grapes. For others, the wine business is a second career as former professionals (e.g., bankers, attorneys, doctors, information technology professionals, and retired members of the military) are making names for themselves in the Texas wine industry (Townsend 2012). “Texas wine” has become a term that encompasses a wide range of different business types, from viticulture and winemaking, to restaurants, events, and tourism (Esco 2009).

### 3.1.3. Texas Wine in the Contemporary Moment

Although the early days of commercial sale in the Texas market were not easy, the wine industry has certainly become more established. Early consumers were poorly educated about wine varieties other than those which had gained notoriety *vis-à-vis* the booming California industry; one winery owner noted that, for a time, at a wine and food festival, consumers “would dismiss Texas wine without even tasting it” (Winery Owner A, personal interview, 12 August 2020). An important development has thus been the acceptance of lesser-known wine varieties. Although the varieties being introduced to the market in Texas—like Tannat and Mourvedre—are not new, they are less familiar to consumers than some other grape types, which means producers need to work harder to connect with consumers. This will continue to be one of the most important challenges Texas winemakers will need to overcome as they attempt to expand into national and international markets.

Marketing challenges aside, these otherwise under-represented wine types allow Texas winemakers to create blends that capture all the grape phenolics a winemaker most often desires. Winemakers also noted that, in order to build flavor profiles that complement each other, they may source grapes from across the large state of Texas rather sourcing exclusively from a smaller AVA. As the quality of the product produced in the state has improved, Texas wines have begun to be accepted into out-of-state markets. Texas wineries have created “really good relationships with the somm [Sommelier] community. In general, we have seen a lot of support from the somm community... from all over the

world” (Winery Owner A, personal interview, 12 August 2020). Regardless of the fact that Texas wine remains largely undiscovered by consumers in other U.S. states and countries, Texans seem to be sold, and their purchases are enough to allow Texas to rival the top wine producing and consuming states in the country.

### 3.2. *The Geography of Wine in Texas*

#### 3.2.1. Environmental Factors in the State

The impetus for the transition from commodity crops to viticulture was largely rooted in a need to conserve water. Traditional crops like corn, sorghum, and cotton flourished for decades in both the Hill Country and High Plains. However, those crops are water intensive, often requiring significant investment in irrigation infrastructure and dependable access to water from aquifers that, in many cases, are in a state of overdraft. Droughts are not uncommon in Texas, and the year 2011 (the most intense one-year drought on record), in particular, was devastating for Texas agriculture and caused many water wells throughout the High Plains and Hill Country to go dry. Access to water is one of the most important limiting factors to the expansion of agriculture in the Texas High Plains (Townsend 2012). Farmers in the region tap into the Ogallala Aquifer, a water source shared by the “breadbasket” states of Texas, Oklahoma, Kansas, Nebraska, and South Dakota. Farmers in this region, particularly the High Plains, require a highly profitable crop that can survive, and even thrive, in difficult growing conditions. Grapes fit the bill.

However, grapevines are more susceptible to fungus, pests, and disease in a humid climate, which is not a problem in the High Plains. Vines can tolerate heat and aridity, are dormant during the winter, and have deep root systems which work to stabilize and secure the vine in the windy conditions of the High Plains. The leaves on the canopy also act as a natural defense against the sun during long summer days as the grapes ripen. The anthocyanins, a type of pigment within the skin of the grapes, also aid in sunburn protection.

The major terroir components of soil, water, and climate in the High Plains in Hill Country are similar to the well-known wine producing regions of Southern France, Spain, and Italy (Brogan 2015). Nevertheless, it is the climate that determines whether a given location is for growing wine grapes. The warm and arid climate conditions in central and west Texas, together with the persistent threat of drought, spell disaster for typical commodity crops; grapes, on the other hand, do well, and even thrive in these conditions. The annual growth cycle of grapes is such that a vine can tolerate high summer temperatures with little increase in watering and still produce a good crop yield. In Texas, vines do need some irrigation, but only for a few months out of the year during late spring and into the summer (Wrede 2010).

Thus, despite conditions that might be problematic for other crops, Texas may have a competitive edge on other wine producing states by having multiple desirable environmental attributes that are needed for grapes to thrive, even—and especially—across such a large state. As such, over time, Texas vineyards have increased in both number and scale as the desirable characteristics of the Texas environment for growing wine grapes is increasingly recognized. That growth has facilitated an increase in fruit sourcing by wineries in both Texas and other states. Industry insiders expect this trend to continue as wineries begin to see the value of place-based designations and organizational memberships, which help businesses create distinction in the market (Texas Wine Growers 2020; Wine Educator A, personal interview, 12 August 2020).

#### 3.2.2. Viticulture and Enology

Winegrape growers face some unique challenges in comparison to other agriculturalists. For example, grape growers are growing a product for which quality trumps quantity; in other words, there are agricultural practices in place which specifically limit



production in order to improve grape quality, which is itself measured across several dimensions (sweetness, skin thickness, size of fruit, density of fruit, etc.). This is unlike the production of other agricultural products, in which, generally speaking, “more” is almost always better. In addition, the grapes grown may end up with different wineries, who may have differing preferences regarding production techniques and timelines, harvest practices and timing, and post-harvest processing. As one winery owner (Winery Owner B, personal interview, 11 August 2020) put it, wineries are not “buying a product from a company...it’s not that simple...[the] logistics of harvesting and caring for a vineyard block, [the specifics of] how that work has to be done, needs to meet the needs of a number of stakeholders”. Put simply, grape growers must sometimes balance the competing demands of different buyers.

The connection between grape-grower and winemaker is an intimate one; some say that “wine is made in the vineyard”, which leads some winemakers to closely monitor conditions in the vineyard over the season—whether or not the vineyard is directly owned or managed by the winery. However, there are other methods for grape sourcing and winemaking as well. Some vintners are more “hands off”, preferring to buy fruit from contracted growers via established contracts, which can be negotiated at the beginning of the season, annually, or on some other timescale. Some prefer to buy fruit off the open market as it becomes available. Others take a mixed approach, doing some or all of the above. As one winery owner said, the idea is that, with good communication, the grower and winemaker can “hopefully steer things in a direction that makes sense for us and also for them” (Winery Owner B, personal interview, 11 August 2020). Whichever model is in use, “growers often want to know before they plant what [grapes]...will be in higher demand,” being highly aware that there is “a symbiotic relationship between growers and the wine producers” (Winery Owner B, personal interview, 11 August 2020).

When it comes to growing grapes, Texas is “...a huge state. We’re never really going to be married to one varietal or two varietals or something like that” (Winery Owner A, personal interview, 12 August 2020). Each AVA in Texas is suitable for growing multiple varieties; however, what grows well in one place may not do well elsewhere. For example, Grenache, which grows well in the Hill Country, may not do as well in the High Plains, while Riesling thrives in the High Plains, but not in the Hill Country. There are ways, however, to work around some of these limitations—e.g., a different variety of grape can be grafted on to the rootstock of another in order to engineer a vine to be more suitable for the conditions in which it will be grown—but cooler-climate or warmer-climate grape varieties do have their limitations, even if grafted.

The overall quantity of fruit grown in Texas is not the only factor that inhibits wineries from buying Texas-grown; the fruit that is available to purchase also costs more, relatively speaking. As one winery owner explains, “There is no question the fruit is more expensive in Texas, and that continues to be a challenge [for us]. Because we are 100% Texas, we sort of accept the cost as part of the way we do business. We view it as having both a marketing advantage...but it is also a sense of authenticity, it’s just part of your identity...every year is different in Texas” (Winery Owner A, personal interview, 12 August 2020). Due to the geography of Texas, you get a little bit of everything when it comes to weather; however, the unpredictable and inconsistent weather is, in essence, what makes the grapes grown in the state so different from year to year. “We have a lot of challenges here, but there is a distinctive taste, [and] that is something that becomes irreplaceable” (Winery Owner A, personal interview, 12 August 2020).

Given that there are so many types of wines that can be made in Texas, industry insiders suggest that winemakers need not focus on perfecting only one variety. For instance, Tempranillo has been called “the grape of Texas” because it was one of the first lesser-known varieties found to grow well in Texas. However, although most Texas wineries have dedicated Tempranillo wine programs, many in the industry do not believe they need to invest much time on the varietal as there are ample opportunities for other “great finds” in so-far-undiscovered varieties as the wine industry in Texas continues to

grow. While other regions may be limited to only a handful of varieties that are suitable for their environmental conditions such that growers there may spend years perfecting the style of a single varietal, in Texas, a wider range of varieties perform well, so growers and winemakers can remain flexible, both in terms of varieties grown and in terms of wine styles produced.

### 3.3. A Look at Texas “Wine Country”

#### 3.3.1. The Hill Country and High Plains: Two Regions, Two Stories

In terms of viticulture, planting vineyards in the Hill Country offers a range of side-line benefits besides wine grape production itself. For example, if the area is covered in Ashe juniper (colloquially known as “cedar”) vegetation, in order to plant a vineyard, a large portion of trees must be cleared. Ashe juniper, although a native species, is a known environmental detriment in the Hill Country, being a thirsty, invasive plant with a large canopy cover, which disrupts the percolation of rainfall into the ground and inhibits the growth of native grasses (Lyons et al. 2009).<sup>1</sup> Given the life cycle of grapes, clearing the land of this kind of vegetation and replacing it with grapevines, paves the way for the regrowth of native grasses within the vineyard.<sup>2</sup> Native grasses improve soil stabilization, which also means minimal agricultural runoff (Wrede 2010). Thus, an increase in vineyards in the Hill Country, insofar as they replace Ashe juniper vegetation, would facilitate at least a partial restoration of grassland species that was otherwise prohibited. Vineyards thus serve a useful purpose in terms of commodity production as well as providing (agricultural) greenspace and serving an impetus to remove environmentally harmful Ashe juniper vegetation.

Although there are numerous vineyards in the Hill Country, they come at a price. Land values are significantly higher in the Hill Country now than they were just a decade ago. In addition to rapidly rising land values, which increase the cost of production due to increased rent or purchase prices, the cost of planting a vineyard in the Hill Country is also higher than elsewhere in the state due to the presence of rocky (limestone or granitic) soils, which necessitate the use of additional equipment for planting. Further, Pierce’s disease is prevalent in Texas, and vineyards in the Hill Country are especially susceptible to the disease (Kamas 2010), which increases financial risk for vineyard growers.

In the High Plains, where the winegrapes of Texas are predominantly grown, there is a mix of various types of agriculture in place. The presence of a strong cattle industry, a large agriculture university, and large-scale, commodity crop production (of crops such as corn, cotton, and sorghum) has shaped the culture in the region. Many farmers, prior to growing grapes, were in some way tied to agriculture, and, as the wine industry grew, some farmers in the High Plains switched from large-scale commodity crops to vineyards. An interview with a High Plains revealed that, upon taking his first harvest to a local winery to sell:

“We set it all out and he weighed it. It wasn’t very much, but he wrote me out a check for \$800 and I just kind of dropped my teeth. And I told [my wife] on the way home, if that would’ve been cotton, that would’ve been eighty cents worth of cotton. You know, that was a huge eye opener for me, how [the] value [of] crops differ from low crops, and I knew then I wanted to get into that for sure”. (High Plains Grower A, personal interview, 7 September 2020).

For him, grape growing has alleviated the stresses of growing cotton, for example, that need a constant supply of water and year-round attention for a lower return on investment.

The High Plains growing region is significantly different from the Hill Country; the region is windy, dry, and flat with deep, red, sandy soils and an aquifer-based water supply. In addition, mechanized vineyard management in the High Plains overall is easier than in the Hill Country. Growers can more often utilize farm equipment because the landscape is considerably flatter and the ability to grow higher yield crops on more



acreage is typical. In the Hill Country, the topographical variation and dissected bedrock make it much more difficult to use certain types of farming machinery and therefore, the vineyards tend to be smaller. Harvesters and pruning machines cut labor costs in the vineyards, but come with a large initial price tag. For a larger vineyard in the High Plains, it would take just a few years to pay off these machines versus the Hill Country, where it could take over a decade due to the limitations of volume and vineyard sizes.

In terms of weather conditions, there are also significant differences between the two areas: “Our problems are very similar [here and there]—they’re pretty much all weather-induced—but it’s very different weather [in each place]” (High Plains Grower A, personal interview, 7 September 2020). Although both places face weather-related hazards, the possibilities for mitigating those challenges vary. For example, while the High Plains can get unpredictable weather, there are tools available that growers can use to respond, including costly, but effective, machines and techniques to save a crop when needed. In the Hill Country, however, the cost of such technological fixes and equipment may not be economically feasible. Moreover, even if the use of the equipment available were financially justifiable, Hill Country growers are impacted by a different set of weather challenges (such higher humidity, hotter temperatures, and flash flooding) that are not as easily countered by the use of equipment.

Although there are a unique set of obstacles associated with viticulture in the High Plains, in a typical year, the crop yields will be higher and less expensive to cultivate in comparison to the Hill Country. Thus, there is a greater availability of grapes from this viticultural area in comparison to others. However, when it comes to producing and selling wines, the Hill Country is better suited because of its proximity to Austin and San Antonio, well established hospitality and tourism services, and retail spaces. Some growers also make their own wines but do not sell at their onsite facilities. In the High Plains, “you have an ideal climate for growing grapes, but the problem is: there’s a tourist behind every tree. And obviously there are no trees. So, the retail side of the business needs to be down where all the bustling population is at...that’s why we ended up down there” (High Plains Grower A, personal interview, 7 September 2020). The copious recreational opportunities (hiking, hunting, fishing, and shopping, to name a few) and its natural beauty adds to the overall culture for the wineries in the Hill Country, which stand in stark contrast to the flat and desolate landscapes of the High Plains.

The constraints faced by Hill Country growers, even as they have access to greater opportunities for tourism and consumer attention, result in a clear reliance on High Plains growers for fruit, allowing wine-based businesses and operations to flourish in both locales. There is a disproportionate number of vineyards in the High Plains area if you look from the perspective of the number of wineries present, and the opposite is true in Hill Country; there are far more wineries than you would expect based on the amount of viticulture present there. This spatial mismatch between winegrowing and winemaking is similar to other (purportedly) “unlikely” wine regions, like Arizona (Myles et al. 2021, which are also thriving despite (previously) unfavorable expectations. This mismatch is driven not only by the quantity of grapes produced, but also by quality and style concerns. As one winery owner in the Hill Country put it:

“Our whites program is entirely dependent on the High Plains. There’s not enough [fruit] to source from down here. So many of the vineyards [in the Hill Country] are small...and are...contracted with one winery, and then no one else can get that fruit. Where[as] in the High Plains, with those huge growers, you [can even] get parts of their vineyards, with multiple contracts going on and you can trade with other wineries depending on their needs. There is much more of a market [for grapes] up there”. (Winery Owner A, personal interview, 12 August 2020).

In other words, the High Plains has larger vineyards and a greater capacity to support a wider array of wine grapes, like white wine grapes and other cooler-climate grapes

(e.g., Cabernet Franc and Semillon) which do not tolerate the Hill Country's growing conditions.

Nevertheless, despite the prevalence of High Plains fruit in Hill Country wines, not all winemakers in the state prefer High Plains fruit. The variations between the Hill Country and High Plains AVAs are distinct enough that some winemakers might have preferences between them. Some winemakers may prefer wine attributes emerging from grapes grown in other regions of Texas (Winery Owner B, personal interview, 11 August 2020) or from elsewhere. The presence of refined and sophisticated preferences of this kind are a clear sign of the industry's development. Overall, when compared comprehensively (Table 1), the Hill Country and High Plains wine landscapes are complex, distinctive, and complimentary in many respects.

**Table 1.** Comparison of the Hill Country and High Plains wine landscapes in Texas.

	Hill Country	High Plains
Socio-environmental context	<ul style="list-style-type: none"> <li>–high overall land values</li> <li>–landscape features limit some agricultural production practices</li> <li>–higher overall costs of production, considering techniques and labor required</li> <li>–better suited to wine tourism due to relative abundance of recreational and other (non-wine) tourism infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>–lower overall land values</li> <li>–strong pre-existing presence of agriculture, especially commodity crops</li> <li>–lower overall cost of production, even factoring in the cost of equipment</li> <li>–wine-based tourism is difficult to cultivate due to location and lack of pre-existing tourism supports in the area</li> </ul>
Geographical and geological factors	<ul style="list-style-type: none"> <li>–geological conditions (i.e., prevalence of rocky limestone or granitic soils) and topography make mechanized vineyard management impractical</li> <li>–high vineyard development costs paired with a relative absence of other commodity crop production</li> </ul>	<ul style="list-style-type: none"> <li>–topography and geology make mechanized vineyard management feasible and cost effective</li> <li>–dry, flat landscape, with deep, red, sandy soils and an aquifer-based water supply, simplifies production practices and promotes higher yields</li> </ul>
Weather and other hazards	<ul style="list-style-type: none"> <li>–weather-related hazards are common, and the cost of technological fixes and equipment may not be economically feasible</li> <li>–even if financially feasible, the particular weather challenges in place (e.g., higher humidity, hotter temperatures, flash flooding) are less easily mitigated through technology or equipment</li> <li>–Pierce's disease, while prevalent across Texas, is especially problematic in this area</li> </ul>	<ul style="list-style-type: none"> <li>–weather can be unpredictable, but the landscape allows for mitigation through the use of agricultural technology and other mitigation techniques</li> <li>–the costs of machinery and techniques are justifiable due to crop yields and overall return on investment</li> <li>–agricultural pests and crop diseases are present, but production practices to combat them are relatively accessible</li> </ul>
Production and consumption outcomes	<ul style="list-style-type: none"> <li>–fewer grapes, in fewer varieties, being produced</li> <li>–greater proportion of wineries and tasting rooms (versus vineyards), with heavy reliance on fruit sourced from the High Plains (or elsewhere) for production</li> </ul>	<ul style="list-style-type: none"> <li>–more grapes, in greater varieties, being produced</li> <li>–greater proportion of vineyards (versus wineries and tasting rooms), with large portions of fruit being sold to Hill Country (and other) producers</li> </ul>

### 3.3.2. Growing Pains in the Industry

As the number of wineries in the Hill Country grew, a greater need for more and better industry infrastructure followed. More wine industry vendors moved into the area and have helped make production and distribution easier.

“There was a time ten years ago when managing to get your hands in a timely way on winery supplies was a difficult venture at large; [equipment wasn’t] available locally, everything was shipped in. Those vendors didn’t want to cater to smaller winery operations because the cost of sale was too high to do that. Today it’s a massively better environment in that way. Winery supplies and winery equipment [are] readily available, also true with barrel supplies. Things are much better now”. (Winery Owner B, personal interview, 11 August 2020).

Now the industry has reached a scale that makes operations here feasible, equipment retailers have located here, using the port of Houston to bring in European tanks, presses, and production equipment at a lower cost than using distribution companies located in California or New York.

The presence of equipment retailers allows smaller and boutique wineries to obtain processing aids that are well-suited to their smaller production size, something that was unavailable to them in the earlier days of industry. These better-tailored options are often more cost effective and allow these smaller wineries to benefit from piggybacking on the shipments that larger wineries have coming in bulk. This cooperative relationship encourages the best price for the best product for the consumer, which strengthens the foundation of the industry overall. Although different wineries are ultimately competitors for consumer and tourist dollars, this kind of “coopetition,” a neologism bridging cooperation and competition (Chim-Miki and Batista-Canino 2017), improves business for all involved. The benefits for coopetition in emerging wine regions (or beer districts or the like...) has been explored elsewhere (Myles and Breen 2018), and has been shown to help a place “make” itself into a wine region (Myles and Filan 2019).

Despite being indispensable as the industry ramped up, High Plains producers lacked certain resources essential for winemaking—like crushers and destemmers, tanks setup with glycol lines for cooling, and presses. To help address these issues, custom crush facilities have now been established near large vineyards. These kinds of facilities expedite the processing of harvested fruit, allowing fruit to be pressed right away (called the “direct-press method”), which is valuable for making rosé and white wines. Until recently, without the availability of such production facilities and machinery, winemakers would be under pressure to compromise their aspirations on wine style or quality—or they might be forced to resort to “old world”-style winemaking techniques (such as barrel fermentation or whole cluster fermentation).

Custom crush facilities facilitate processing, particularly for smaller wineries, by providing a place to crush their freshly harvested fruit (an essential step prior to fermentation) while reducing their equipment costs. The existence of such a facility means that crush equipment need not be purchased directly by these small businesses; instead, they can rent equipment shared with others, making the overall cost more manageable. Another benefit of custom crush is that excess, uncontracted fruit from growers can be processed promptly and properly and, ultimately, stored to create bulk wines. “Bulk wines” are then used to create a baseline wine that winemakers can further vintner later to meet the needs of their individual wine programs.

The bulk wine market has become prevalent in Texas as winemakers have responded to differences in winegrape harvest and availability year over year. For example, fruit may be scarce in certain years overall or, perhaps, distributors are looking for a particular vintage of a wine which has already sold out. The presence of bulk wines after harvest provides a kind of insurance policy for wineries who would otherwise have to disappoint distributors or see their wine programs suffer. In addition, the market for bulk wine

supports growers such that they can work to increase their harvests confidently year-to-year without worry that uncontracted fruit will go to waste.

Further, bulk wines made from Texas grapes help wineries to build their “Texas-grown” wine portfolio, which is extremely valuable as consumers begin to demand 100% Texas grown fruit, as local palettes become more refined, and “truth in labeling” rules and regulations increase buyers’ awareness of product sourcing (Meewes 2020). In contrast, in earlier years, when wineries could not always procure an adequate supply of fruit in a given year, they would/could bring in bulk wines from out of state to fill in the gaps. This was one strategy winemakers used to survive in the industry’s infancy, before growers could supply the local demand for grapes. However, this practice is becoming less common each year.

### 3.3.3. Evidence of a Maturing Industry and Market

In service of improving the quality of wine produced in the state, professional education and certification programs, such as those offered by Texas Tech University in Lubbock, have played an important role in the industry’s development. In 2002, Texas Tech expanded its offerings through a satellite campus in the Hill Country at Fredericksburg, where it offers viticulture learning opportunities in a teaching vineyard. Likewise an influx of wine consultants providing advice to both growers and winemakers on different aspects of the business has contributed to an overall improvement in wine quality. As growers, winemakers, and other industry stakeholders become better educated, production becomes more efficient, wine quality improves, and the industry as a whole benefits.

A few wineries in Texas distribute their product, but many do not, relying instead on on-site sales for revenue. The decision to distribute has several implications. For example, if a winery opts to conduct predominantly on-site sales, there is less pressure in terms of the required scale of grape or wine production. Sales via distribution channels (versus on-site sales only) are not essential for many wineries to cover their overhead costs, but this form of marketing allows wineries to advertise to distant consumers and build their brand. As one winery owner would put it (Winery Owner B, personal interview, 11 August 2020): “Most Texas wineries are relatively small [in comparison to] the grand scale of [the] wine industry across the world, so we often do things by hand. [We’re] a little more artisan”. Whether the decision is made to distribute or not, Texas wineries benefit from a unique marketplace, wherein ample Texas pride often inspires local consumers to opt for Texas products over those produced elsewhere.

The Hill Country wine industry, where most wine tourism occurs, has been able to overcome obstacles over time as additional businesses have emerged to meet the needs of industry actors already in place. Wine tour companies, for example, have been established to meet several emergent needs. Such companies accommodate tourists by bringing them in contact with several wine purveyors in one day, while keeping them safe. It is in everyone’s interest to have wineries work together with such companies to bring customers into contact with wineries—both big and small—in a safe and rational manner.

Another growth strategy for wineries, facilitated by winery visits, is the use of wine club memberships. When a consumer visits a winery and has enjoyed the experience, they might be enticed to become a winery “member”. These memberships play a vital role in the business models for wineries both large and small since they help to create a steady stream of income, revenue that can be counted on even in unpredictable times. This model became viable in 2005, when a bill was passed in Texas that allowed wineries to ship wines directly to consumers (Fauchald 2005), appealing to consumers who desired regular wine shipments from their favorite wineries.

As the number and size of wine clubs grew, Wine Cub (Wine Cub 2020), an aggregating wine membership business, emerged as a business solution for individual wineries. Rather than managing the shipment of wine club allocations throughout the year, a contract with Wine Cub shifts the administrative burden away from wineries, and, further, allows wineries to ship to the majority of the United States using a single contract

instead of needing to acquire individual permits for each state, which would be necessary otherwise. This solution allows wineries to focus on selling memberships and building their clientele without the hassle of managing the shipments themselves.

Texas consumers have come a long way in terms of their wine demands and wine producers have been able to meet those demands with higher quality wines. Though, it seems there is a generational element to these changes; as one wine educator (Wine Educator A, personal interview, 12 August 2020) put it, the younger generations are “willing to try anything” while the “older generation is unwilling to change”. For example, industry professionals have come to understand that if their customers want a California cabernet, they may be disappointed to find that cabernet does not grow in Texas like it does in California. However, Texas wineries have alternatives that are similar in style which, although perhaps unfamiliar, will nevertheless offer a high quality tasting experience (paraphrased from Winery Owner B, personal interview, 11 August 2020). This is part of the complexity of Texas wine. Those in the industry have had to grow and adapt production to meet consumer preferences; growers and winemakers have had to identify grapes that “meet the growing conditions of Texas,” which is itself “an ever-evolving process,” as well as help themselves and their customers to understand “what’s right for them in terms of their tasting profile” (Winery Owner B, personal interview, 11 August 2020). While this is an ongoing process, the transition in Texas wine from nascent to established, even if still “emerging,” is clear.

The discussion that follows traces the relative impact of Texas wine and outlines the industry’s significance in the region and beyond.

#### 4. Discussion

##### *The Socio-Economic Impacts of Texas Wine*

Texas ranks fifth in terms of wine production in the United States and the economic impact of the wine industry in the state is estimated to be a whopping \$13 billion (Willcox 2021). Wineries benefit local economies through both the direct and indirect provision of jobs and tax revenue. Wineries have made the Hill Country a destination; tourists not only visit the wineries, they also stay in the hotels, eat in local restaurants, and shop at local retail outlets. They often hire tour guides or limousine companies to act as “designated drivers”. The compounding economic benefits of a thriving fermentation-focused region can be significant (Slocum et al. 2018). However, there can also be drawbacks to these kinds of fermented landscapes (Myles et al. 2021). For example, there has been a significant increase in traffic volume and congestion, particularly in Fredericksburg (in the Hill Country) where the increase in traffic has been viewed as a safety issue (TXDOT 2020), particularly in light of the increase in potentially intoxicated drivers on the rural roads.

The potential downsides notwithstanding, the place-based impacts of this fermentation-focused economic development are generally seen as positive overall (Hiner 2016; Myles and Filan 2017). For instance, the Texas Hill Country Wineries Association (THCWA) has hosted multiple events over the years that draw visitors into the Hill Country for a month-long wine tasting event. An interview with a THCWA board member revealed that these events not only generate revenue for the industry, but also encourage consumer education through wine tasting and interactions with winery personnel (Wine Educator A, personal interview, 12 August 2020). Over fifty wineries participate for each of these events, four times a year, and each event sells out—even as the number of tickets made available has increased year after year (Wine Educator A, personal interview, 12 August 2020). For the Hill Country, this has added increased traffic into the wineries, but has also increased the demands for other services (e.g., lodging, private tour companies, dining establishments, etc.), which provides an economic boom to the whole area.

Although the industry is growing and maturing in both regions, it is clear that the Hill Country is better suited for wine tourism because the High Plains simply lacks the infrastructure needed to be hospitable to visitors and guests. The Hill Country features

the majority of the production facilities in the state (Figure 1) and, further, has more to offer potential visitors than just wine. There are other activities available that appeal to a range of age groups, with diverse activities the whole family can enjoy, and a scenic natural landscape to enjoy (Figure 2). Yet, even as the Hill Country has evolved to become a wine-based destination while the High Plains has not, the Hill Country's wine tourism is an essential complement to the growth of vineyards and processing facilities in the High Plains (Table 1).

The High Plains and Hill Country regions, though separated by more than 300 miles, have become closely intertwined (Myles et al. 2022). Viticulture and enology focused business and infrastructure have developed in step with, and for, the wine industry in Texas, providing a critical support system for its expansion. As wine production and consumption landscapes have shifted and grown in the state, social and cultural changes have followed. Texas has transitioned from a place of obscurity in the wine world toward one of global recognition, however unlikely, and the impact of wine on the state's economy and culture are undeniable.



**Figure 2.** “Harvest Sunrise”, picturing Hill Country AVA, Dripping Springs, TX, at Hawk’s Shadow Winery and Vineyard. (Photo by Hill Country Light Photography, Miguel Lecuona; September 2020).

## 5. Conclusions

The evidence in Texas, as well as other “emerging” wine areas, is that the ancillary social or community supports, business and industry developments, and shifting legal or regulatory frameworks that facilitate the growth of the industry (Myles and Filan 2019; Overton 2020) usher in a suite of changes that result in more than just economic shifts, but also environmental and cultural transformations as well (Myles 2020). So, although many of those interviewed for this project continue to regard California and Oregon as industry monoliths, and rightly so given their relative levels of production and consumption, they are not monoliths in the sense of being homogenous and unified—and neither is Texas.

The wine industry everywhere is increasingly complex and multifaceted—as is the case in Texas—and industry insiders in the state soon hope to be able to compete at the same level as the wider industry giants. Because while growers in the Hill Country and High Plains face various challenges, these challenging circumstances are precisely what create the unique tastes of Texas wines, a reality that growers and winemakers have begun to embrace. As noted recently in *Wine Spectator Magazine* (Balter 2019), “The future is bright for Texas wine; An emerging wine region on the cusp of something great”. So,

while the path has not always been smooth, the Texas wine industry has clearly settled into a stable position.

While early winemakers were unable to produce premium wine at a competitive price due to a lack of infrastructure, legal restrictions, and other obstacles, there are now more growers who have added new grape varieties and increased the quantity of grapes available to the Texas market. There are more vendors and suppliers who are willing to work with Texas wineries, which has allowed them to become more established and mature. Texas has a more diverse and educated consumer base willing to try and appreciate Texas wines for their unique attributes and qualities. There is now more infrastructure in place to support tourism and Texas-focused consumption.

In sum, wine has become a major part of the regional identity of the Texas Hill Country and High Plains and the relative pace of this evolution has been remarkable. Texans seem to have embraced the wines—and the wine culture—produced in their state (Myles et al. 2022). Since Texas wine is often made from lesser-known grape varieties, the challenge of marketing these wines on a national and international scale remains. However, the industry is still developing and, by all accounts, is enthusiastically focused on its strengths in order to make high quality and delicious wines—no matter how unexpected.

**Author Contributions:** Conceptualization, K.C. and C.C.M.; methodology, K.C. and C.C.M.; validation, K.C., C.C.M., and C.G.T.; formal analysis, K.C., C.C.M., and C.G.T.; investigation, K.C.; data curation, K.C.; writing—original draft preparation, K.C. and C.C.M.; writing—review and editing, C.C.M., K.C., and C.G.T.; visualization, K.C. and C.G.T.; supervision, C.C.M.; project administration, K.C. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of Texas State University (protocol code 7362 on 8 May 2020).

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Not applicable.

**Acknowledgments:** We would like to thank those who participated in this research and to acknowledge several anonymous reviewers who improved the paper's quality.

**Conflicts of Interest:** The authors declare no conflict of interest.

## Notes

1. The tree does play a role in the life cycle of an endangered species, the Golden Cheeked Warbler, which garners attention with regard to removal efforts; however, the bird only uses a small portion of the cedar tree bark for making its nests, so the species can maintain their nest-making with only a fraction of the current cedar trees coverage now available in the area (Groce et al. 2012).
2. After harvest, when all the grapes have been picked, grapevines go dormant through early spring, leaving a large window during the year for other plants to flourish (Wrede 2010). Native grasses and other plants can grow between the vine rows with hardly any interference or competition.

## References

- Kamas, Jim, ed. 2010. *Pierce's Disease Overview & Management Guide*. : College Station: Texas A&M AgriLIFE. Available online: [aggiehorticulture.tamu.edu/fruit-nut/files/2010/10/Texas-Grape-Growers-PD-Management-Guide.pdf](https://aggiehorticulture.tamu.edu/fruit-nut/files/2010/10/Texas-Grape-Growers-PD-Management-Guide.pdf) (accessed on 10 September 2020).
- Ashcraft, Brian 2022. Texas Still Has the Fastest-Growing Cities in the US. *Local Profile*, June 3. Available online: <https://localprofile.com/2022/06/03/texas-population-cities-growing/> (accessed on 9 September 2022).
- Balter, Emma. (2019) "The Future Is Bright for Texas Wine". *Wine Spectator Magazine*. Available online: <https://www.winespectator.com/articles/future-is-bright-for-texas-wine> (accessed 22 September 2020).
- Brogan, Ayngelina. 2015. This Texas Wine Region Has Been Dubbed the 'New Napa'. *Huff Post*. Available online: [https://www.huffpost.com/archive/ca/entry/this-texas-wine-region-has-been-dubbed-the-new-napa\\_b\\_7867550](https://www.huffpost.com/archive/ca/entry/this-texas-wine-region-has-been-dubbed-the-new-napa_b_7867550) (accessed 20 September 2020).



- Chim-Miki, Adriana F., and Rosa M. Batista-Canino. 2017. The coopetition perspective applied to tourism destinations: A literature review. *Anatolia: An International Journal of Tourism & Hospitality Research* 28: 381–93.
- Esco, Melinda. 2009. *Texas Wineries*. Fort Worth: TCU Press.
- Fauchald, Nick. 2005. *Texas Legislature Passes Bill Allowing Wineries to Ship to Consumers*. Available online: <https://www.winespectator.com/articles/texas-legislature-passes-bill-allowing-wineries-to-ship-to-consumers-2524> (accessed on 22 September 2020).
- Groce, Julie E., Kathryn N. Smith, R. Neal Wilkins, and David Wolfe. 2012. The Golden-Cheeked Warbler: History of a conflict. *Wildlife Society Bulletin* 36: 401–7.
- Hiner, Colleen C. 2016. Divergent perspectives and contested ecologies: Challenges in environmental management along the rural-urban interface. In *A Comparative Political Ecology of Exurbia: Planning, Environmental Management, and Landscape Change*. Edited by Laura Taylor and Patrick T. Hurley. Berlin: Springer, pp. 51–82.
- Johnson, H., and J. Robinson. 2007. *The World Atlas of Wine*. London: Mitchell Beazley.
- Kane, Russell. 2012. *The Wineslinger Chronicles: Texas on the Vine*. Lubbock: Texas Tech University Press.
- Kane, Russell. 2018. A taste of Texas wine history. *Edible Houston*. Available online: <https://ediblehouston.ediblecommunities.com/drink/taste-texas-wine-history> (accessed on 26 September 2020).
- Lyons, Robert K., Richard V. Machen, and M. Keith Owens. 2009. *Juniper Biology and Management in Texas*. Texas Farmer Collection. Texas A&M AgriLife: College Station, TX.
- Marks, Michael. 2018. Texas Has Just Five Dry Counties Left, Why Is That? The Texas Standard. Available online: <https://www.kut.org/post/texas-has-just-five-dry-counties-left-why> (accessed on 22 September 2020).
- McEachern, George R. 2003. A Texas grape and wine history. Proceedings of the 10th Annual Oktober Gartenfest, Jointly Sponsored by Texas Cooperative Extension and the University of Texas Center for American History, Winedale, TX, USA, October 24–25.
- Meewes, Veronica. 2020. *How Texas Is Texas Wine?* The Austin Chronicle. Available online: <https://www.austinchronicle.com/food/2017-04-28/how-texas-is-texas-wine/> (accessed on 28 September 2020).
- MKF Research. 2008. "The economic impact of wine and grapes on the state of Texas 2008." Texas wine marketing research institute, Texas Tech University. Available online: [https://www.depts.ttu.edu/hs/texaswine/docs/FINAL\\_Economic\\_Impact\\_TX\\_2008.pdf](https://www.depts.ttu.edu/hs/texaswine/docs/FINAL_Economic_Impact_TX_2008.pdf) (accessed 20 September 2020).
- Morse, S. 1990. The growing Texas wine industry: Product distribution problems and consumer preferences of Texas-produced wines. *Journal of Food Distribution Research* 21: 43–44.
- Myles, Colleen C., ed. 2020. *Fermented Landscapes: Considering How Processes of Fermentation Drive Social and Environmental Change in (Un)expected places and Ways*. Lincoln: University of Nebraska Press.
- Myles, Colleen C., and Jessi Breen. 2018. (Micro)movements and microbrew: On craft beer, tourism trails, and material transformation(s) in three urban industrial sites. In *Craft Beverages and Tourism, Volume 2: Environmental, Societal, and Marketing Implications*. Edited by Christina Kline, Susan L. Slocum, and Carol T. Cavaliere. Cham: Palgrave. New York: Springer.
- Myles, Colleen C., and Trina Filan. 2017. Boom-and-Bust: (Hi)stories of Landscape Production and Consumption in California's Sierra Nevada Foothills. *Polymath* 7: 76–89.
- Myles, Colleen C., and Trina Filan. 2019. Making (a) place: Wine, society, and environment in California's Sierra Nevada Foothills. *Regional Studies, Regional Science* 6: 157–67.
- Myles, Colleen C., Michele Tobias, and Innisfree McKinnon. 2021. 'A big fish in a small pond': How Arizona wine country was made. In *Agritourism, Wine Tourism, Craft Beer Tourism: Local Responses to Peripherality through Tourism Niches*. Edited by Maria G. Pezzi, Alessandra Faggian and Neil Reid. New York: Routledge, pp. 93–112.
- Myles, Colleen C., Kourtney Collins, and Christi G. Townsend. 2022. Wine, deep in the heart of Texas. In *Routledge Handbook of Wine and Culture*. Edited by Steve M. Charters, Marion Demossier, Jacqueline Dutton, Graham Harding, Jennifer Smith Maguire, Denton Marks, and Tim Unwin. London: Routledge.
- Overton, J. 2020. Landscapes of Failure: Why Do Some Wine Regions Not Succeed? In *Fermented Landscapes: Lively Processes of Socio-Environmental Transformation*. Edited by Colleen C. Myles Lincoln: University of Nebraska Press.
- Perry, Ronald L. and Hollis H. Bowen 1974. *A Feasibility Study for Grape Production in Texas*. College Station: Texas Agriculture Experiment Station, Texas A&M.
- Phillips, Rod. 2014. *Alcohol: A History*. Chapel Hill: The University of North Carolina Press.
- Slocum, Susan L., Christina Kline, and Carol T. Cavaliere. 2018. *Craft Beverages and Tourism, Volume 2: Environmental, Societal, and Marketing Implications*. Cham: Palgrave Macmillan.
- Texas Alcoholic Beverage Commission (TABC). 2022. Texas Licensing Public Inquiry for active "G" Permits.
- Texas Wine Growers. 2020. *Our Mission*. Available online: [www.texaswinegrowers.com/](http://www.texaswinegrowers.com/) (accessed on 10 September 2020).
- Townsend, Christi G. 2012. An Evaluation of Hazard Awareness among Viticulturists in Texas. Unpublished PhD dissertation, Texas State University, San Marcos, Texas, USA.
- Texas Department of Transportation (TXDOT). 2020. Fredericksburg Relief Route Study. Available online: <https://www.txdot.gov/in-side-txdot/projects/studies/austin/fredericksburg-relief-route-study.html> (accessed on 26 September 2020).
- United States Department of Agriculture (USDA). 2020. 2020 Texas Wine Grape Varieties. National Agriculture Statistics Service. Available online: [https://www.nass.usda.gov/Statistics\\_by\\_State/Texas/Publications/Current\\_News\\_Release/2021\\_RIs/tx-wine-grape-varieties-2020.pdf](https://www.nass.usda.gov/Statistics_by_State/Texas/Publications/Current_News_Release/2021_RIs/tx-wine-grape-varieties-2020.pdf) (accessed on 8 September 2022).
- Willcox, Kathleen 2021. Texas 2021 Harvest Report: Low Quantity, High Quality. *Advisor: Wine Industry Network*, October 26. Available online: <https://wineindustryadvisor.com/2021/10/26/texas-2021-harvest-report>. (accessed on 9 September 2022).

---

Wine Cub. 2020. Available online: <https://www.gowinecub.com/> (accessed on 7 September 2020).

Wrede, Jan. 2010. *Trees, Shrubs, and Vines of the Texas Hill Country*. College Station: Texas A&M University Press.