

Texas wine grape guide

Texas Department of Agriculture
Susan Combs, Commissioner



GO TEXAN.

The past two decades have been a time of incredible growth for the Texas wine industry. Wine production in the state surged from 14,000 gallons in 1979 to a high of 1.6 million gallons in 1997. Texas wineries – now numbering 40 and counting – expect to hit a new record early this century by producing 2 million gallons of wine.

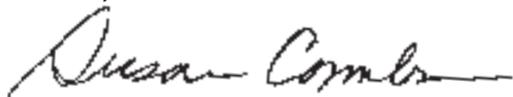
Overall, Texans consume nearly 37 million gallons of wine a year – leaving plenty of room for Texas wineries to produce an increasing share. And we know that given the choice, Texans would prefer to buy a product made and grown in Texas. With a focus on increasing awareness and sales of Texas wines and continually improving the state’s reputation for quality, we can look forward to seeing the Texas wine industry grow and flourish. And that could mean opportunities for Texas producers interested in diversifying into new crops such as grapes.

We developed this guide in answer to the many requests we have received for information on growing grapes in Texas. For established vineyards, grapes can yield about \$1,800 an acre. Compare that to recent average returns of \$270 an acre for corn, \$221 an acre for cotton and \$77 an acre for wheat. However, vineyard cultivation in Texas also poses many challenges. It is not a venture to be entered into without significant preparation and requires a major investment of time, money and know-how. Many experts in the field urge potential growers to work closely with wineries and ensure they plant the right grapes in the right places.

The Texas Wine Grape Guide presents a comprehensive overview of the many factors that need to be taken under consideration when looking at wine grape production – from choosing a site to soil requirements and water needs. It takes a look at where the Texas wine industry has been and where it is headed – outlining the many opportunities and challenges offered by different varieties of grapes and growing areas in the state. This guide will give you a good idea of what it takes to get started. It also will point you in the right direction to locate the additional resources you’ll need.

I invite you to use this guide as a springboard to lead you into deciding if grape growing is right for you. By working together, we can keep our wine industry growing and capitalize on the many exciting opportunities this offers our state and our producers.

Sincerely,

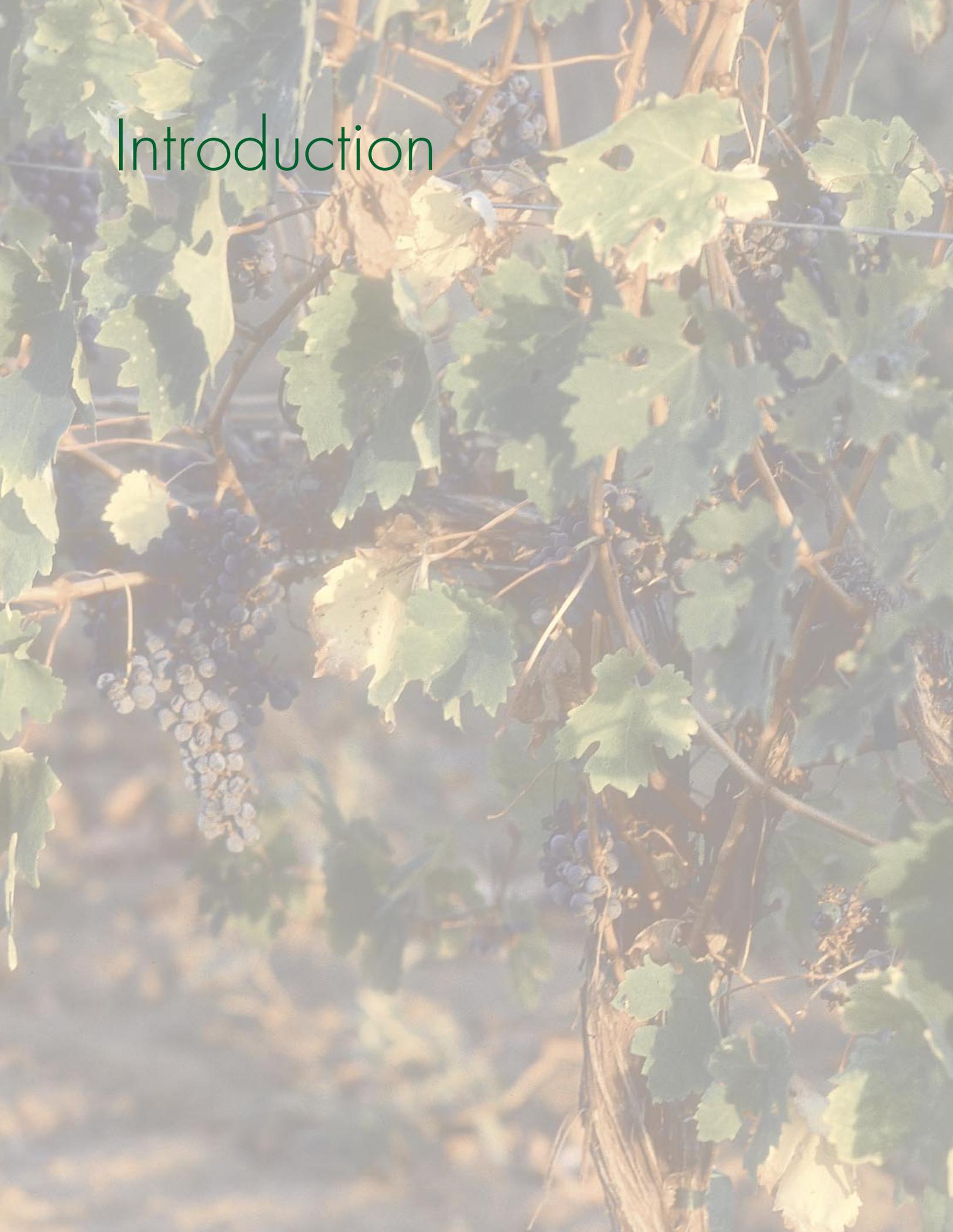


Susan Combs
Commissioner



GO TEXAN.

Introduction



Introduction

Texas wine has come a long way since its emergence in the late 1970s as a new industry with a bright future. The industry has grown and matured and today Texas is the country's fifth-leading wine state, producing varietals, table, dessert and sparkling wines. The state has 40 wineries, six designated appellations of origin and wines that distinguish themselves in national and international competitions.

Still, Texas wines face competition. California produces 75 percent of all the wine consumed in the United States, while Chilean, French and other imports take a big bite out of U.S. wine sales. What's more, a Texas Cabernet Sauvignon does not taste like a California Cabernet or a French Bordeaux, a fact that can create market resistance among some consumers.

To combat such problems and build on the industry's success, Texas wineries need consistent quality and a stable supply of grapes, higher-yielding vineyards and larger acreage for popular varietals. Texas grape growers and winemakers are not trying to imitate others, but to produce wines with a character and quality of their own, deserving of a Texas label. As the industry continues to grow, the reputation and acceptance of its wines will grow with it as both wineries and grape growers focus on producing the best product possible.

Though grape production is an exciting prospect, the subject should also be approached with a full understanding of what it takes to be successful. Wine grapes are more difficult to grow than most crops, and growing grapes in Texas is harder than growing them in California. Vineyard cultivation is a challenging, serious business.

Establishing a vineyard costs anywhere from \$10,000 to \$30,000 an acre, depending on size, location and improvements – and that's not including the price of land and equipment. Intense weather conditions and the presence of pests and disease can create headaches, crop losses and vine death. Pierce's disease in particular is a serious potential problem for vineyards and is considered by many to be the single greatest threat to susceptible grapes in Texas. The risk is much lower in areas that experience severe winter temperatures, such as the South Plains and Far West Texas.

However, there is also great potential. Texas has a viable wine industry with an annual economic impact of \$100 million, a figure that soars even higher when tourism and hospitality events are added. Overall, Texans spend more than \$500 million a year on wine. Recently enacted legislation in Texas amending restrictions on winery sales in dry areas is expected to create and expand more wineries and increase demand.

Yes, Mother Nature presents challenges to growing grapes, but areas of Texas produce excellent fruit. As more producers are trained in the art of viticulture, Texas grapes and Texas' reputation will continue to thrive.



History of Texas Wine Grapes

For thousands of years, rich Texas soil nurtured wild grapes along rivers and streams, but it was not until Spanish missionaries arrived in the 17th century that vineyard cultivation began near modern-day El Paso. In the 1800s, European settlers brought grapevine cuttings from their homelands, establishing vineyards across South and Central Texas. Many grapes succeeded at first, but only native Texas varieties survived. In 1900, Texas had more than 25 wineries. Though several went back into business after the repeal of Prohibition, only one of these – Val Verde Winery in Del Rio – remains operational today.

In the 1970s, the Texas wine industry began its resurgence. The first new vineyards were established by Bobby Smith at Springtown and the Sandy Land Grape Growers Association west of Lubbock. The association was led by Clint McPherson and Robert Reed, who founded Llano Estacado Winery in 1976. Dr. Roy Mitchell, a chemistry professor at Texas Tech University, was also active in the establishment of the industry at that time. By mid-decade, interest in wine production was accelerating at Fort Worth, Fredericksburg and Fort Stockton. Though French-American hybrid grapes initially were considered the foundation of the new industry, grape trials throughout the 1970s indicated that classic vinifera could be grown successfully in Texas.

In 1985, Texas wines began receiving national and international recognition. A year later, Llano Estacado made its mark on the American wine scene by winning a Double Gold award at the prestigious San Francisco Fair Wine Competition. Texas wines have received thousands of awards at state, national and international competitions since then.

Current Production

Texas wine grape growers operate 210 commercial vineyards on a total of approximately 3,200 acres. Current production is valued at \$38.4 million.

Growing Areas

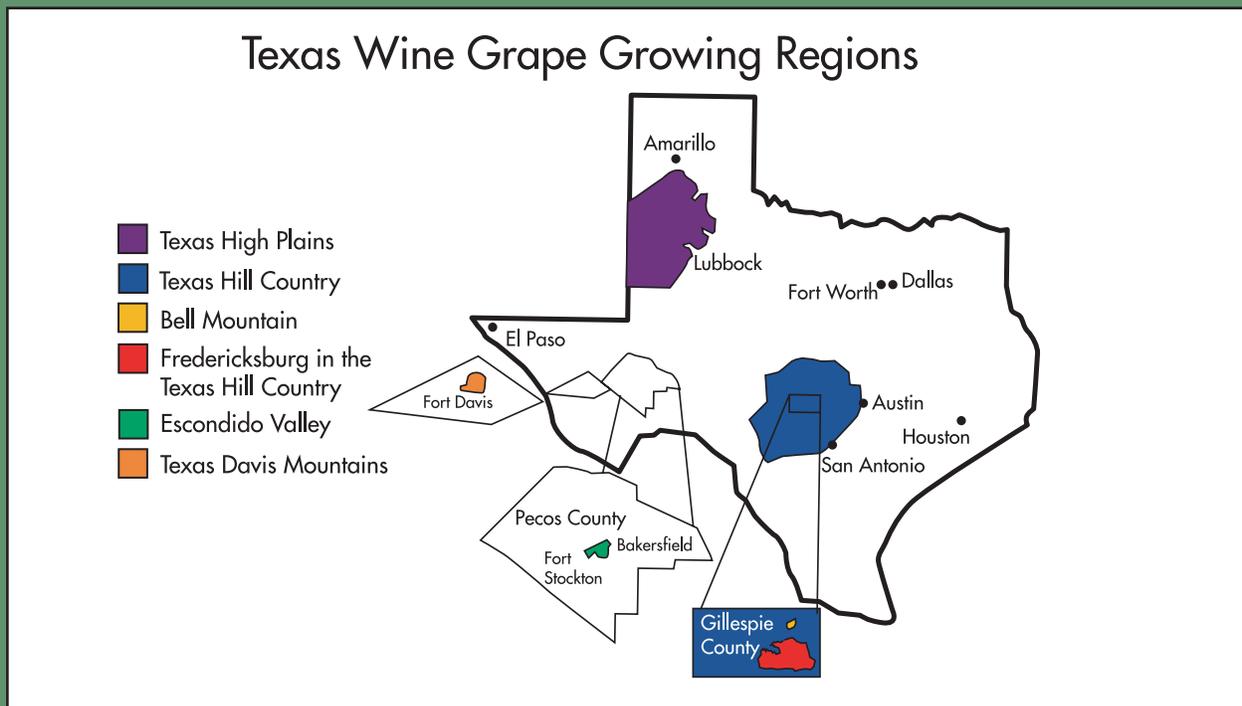
The Trans-Pecos Region in Far West Texas and the Texas High Plains Viticultural Area on the South Plains contribute 80 percent of the state's wine grape acreage. Approximately 40 percent is planted in each area.

Pecos County near Fort Stockton ranks first among counties with more than 1,000 acres of wine grapes at Ste. Genevieve Winery. Lubbock County is second with about 560 acres.

The Texas Hill Country, north of New Braunfels and Boerne to San Saba, west to Menard and east to Austin, has approximately 600 vineyard acres, with some 250 acres planted in the state's north central region.

Growing conditions limit grape production in South and East Texas to varieties that are tolerant to Pierce's disease. In addition to growing native and hybrid grapes, many wineries in these areas import *Vitis vinifera* fruit from the South Plains and Far West Texas.

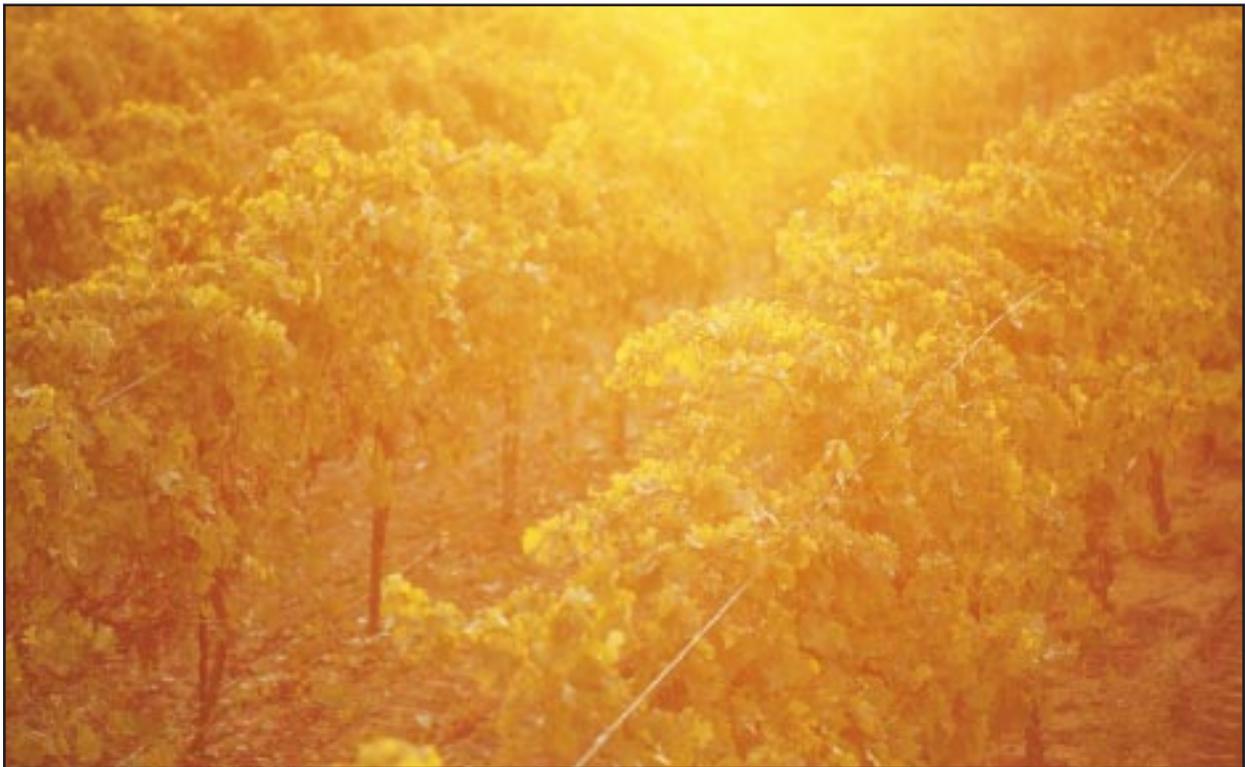
Southeast Texas has a growing number of vineyards and vineyard acreage. Several new wineries are expected in the area within the next couple of years.



New State Law

A new state law effective Sept. 1, 2001, is expected to increase demand for Texas wine and encourage winery construction and grape planting over the next five years. Until now, the regulatory patchwork of "wet" and "dry" areas has hampered wineries because many of the best places to grow grapes are in "dry" areas. While regulations did not prevent growing grapes in these areas, they reduced incentives for building new wineries and for established wineries to plant or expand vineyards.

Under the new law, wineries in "dry" areas may sell wine at the winery by the taste, bottle and case. Texas wineries may also now ship wine purchased by consumers of legal age to their homes in either "wet" or "dry" areas when orders are placed in person at the winery. If a consumer purchases wine over the phone, fax or Internet, the wine may be shipped to a package store for pick-up or delivery. Package stores accepting wine shipments must be members of the new Texas Wine Marketing Assistance Program at the Texas Department of Agriculture. Stores may charge up to a \$3.50 handling fee.



Planning for Success



10 Steps To Growing Grapes Successfully

•1•

Determine if there is a market for your grapes. Talk with wineries you are planning to sell to and find out what types of grapes they are interested in buying. It's a good idea to obtain a contract or solid commitment from one or more wineries before you plant.

•2•

Know what you're doing. The most successful Texas growers to date were already farming before they began growing grapes. Lacking this background, if you have an eye for detail and can follow set procedures, you are still a good candidate, but you must either understand horticultural production or be committed to learn through research and training.

•3•

Do research. Talk to local growers and your county Extension agent to find out which grape varieties grow best in your area and how to grow them. Make sure these are the varieties that wineries would be interested in buying. You can get valuable technical information by contacting experienced viticulturists at the Texas Cooperative Extension in Lubbock at (806) 746-6101 and in Fredericksburg at (830) 997-7047. Grayson County College in Denison also offers two-year viticulture and enology degree programs as well as continuing education courses. The college can be reached at (903) 465-6030.

•4•

If a winery is included in your plans for a vineyard, do extensive market research to determine the wines you will make and the best location for your facility. This should include determining your customer base and the types of wine these customers would be interested in buying. Assess potential demand and sales projections.

• 5 •

Have enough capital to live comfortably for 3 to 5 years without any return from your vineyard and enough time to devote to your new enterprise. Part-time grape farming rarely succeeds, especially when a vineyard is larger than one acre.

• 6 •

Make sure your vineyard site has the right soil and an adequate water supply.

• 7 •

Start conservatively with smaller acreage, especially if you have limited knowledge of farming and farm machinery. This will give you the chance to learn about growing grapes without risking a huge investment. Include a 150-foot cleared buffer zone around vineyards planted with grapes susceptible to Pierce's disease in at-risk areas to create an unfavorable environment for the insects that spread the disease.

• 8 •

Get a mentor, a successful grower willing to share knowledge. Meet growers by networking through organizations such as the Texas Wine and Grape Growers Association at (817) 424-0570 or by contacting resources such as the Texas Wine Marketing Research Institute at Texas Tech University at (806) 742-3077. Attend educational events produced by organizations such as the Texas Cooperative Extension, and seek out information from books, trade magazines and other resources. There are also private consultants who can help you get started or assist with specific challenges.

• 9 •

Learn how to prune grape vines. Pruning can be challenging and complicated when you are trying to balance vine health and maximum production of quality fruit. Every vine must be pruned annually. Tying vines is also done by hand, even in large mechanized vineyards.

• 10 •

Develop the patience and mentality of a tree farmer. It takes long-term vision, persistent effort and continual learning to be a successful grape grower.

Time Line

• 1 •

Site selection – Selecting a site is probably the most important decision for a potential grape grower. In areas prone to Pierce’s disease, this means taking into consideration the factors that heighten or mitigate the risk of the disease. You should also ensure that the site has the proper soil type and depth, water quantity and water quality conducive to grape growing, including the best chance of avoiding spring frost. In the South Plains, sites with a reduced risk of winter injury and hail are the most ideal.

• 2 •

After purchasing a site – Set aside anywhere from one to two years for site preparation and ordering plants and other necessary materials. Getting the site ready includes land preparation, irrigation installation and fencing. The time required for land preparation, such as clearing brush and ripping the soil, varies according to the site’s location and the improvements needed, but generally averages about one year.

• 3 •

First year – Erect trellises before planting to keep grape vines from trailing along the ground, which increases the risk of fungal disease. Growers in areas with lower fungal disease risk, such as the South Plains, may be able to postpone trellises until the second year. Plant vines from late February through April, depending on location. A good rule of thumb is to plant just before an area’s last freeze. The plants won’t come out until after the freeze date, eliminating the threat of damage. If the vineyard has been prestaked, plant each vine as close to the stake as possible for support and protection. The main objective is to develop a strong, healthy root system. Thorough weed control is essential to establishment. In some growing areas that have a warm climate and a longer growing season, it may be possible with good vineyard management to have a light crop in the second year. This would require vine training in the first year and would move the time line ahead one year.

• 4 •

Second year – Vine training begins. If you did not erect trellises last year, do so now. Each vine must be cut and tied at least four times in the spring and early summer. Buds must be removed from undesirable locations, primarily from along the lower portion of the developing trunk. Maintain weed control.

• 5 •

Third year – Repeat tying, pruning and removing buds from the lower trunk several times. The vines should be established by now and you may have a light crop of grapes.

• 6 •

Fourth year – Vines should produce a mature yield of 35 percent to 50 percent of potential.

• 7 •

Fifth year – Yields will vary from 65 percent to a full crop.

Costs vs. Returns

Wine grapes may net about \$1,800 per acre for established vineyards depending on volume, variety, management skills and production region. Keep in mind that net returns may vary from year to year. Leading Texas vineyards generate average gross revenues of more than \$4,500 per acre per year. In general, the economic potential of grape production in West Texas is superior to the rest of the state because of lower land costs, less land preparation, lower chemical inputs and consistently higher yields of certain grape varieties.

Can growers earn more from popular grapes such as Cabernet Sauvignon, Chardonnay and Merlot? The answer is “yes and no.” As a general rule, growing premium grapes often means less volume but higher market prices. For example, Cabernet producing 5 tons per acre might sell for \$1,000 a ton while Chenin Blanc yielding 10 tons per acre might bring \$400-\$700 per ton.

The following examples of per-acre costs and yields are approximate and may vary according to variety and conditions in any given year. Figures are based on mature vineyards. The average yield for the state in 1999 was 2.2 tons per acre. Yields overall may range from 0 to 12 tons per acre.

Estimated Yearly Operating Costs

Southeast Texas	\$3,500 per acre	South Plains	\$1,200 per acre
North Texas	\$2,500 per acre	Hill Country	\$3,000 per acre
Far West Texas	\$1,500 to slightly less than \$2,000 per acre		

Estimated Yields (*assuming zero loss to weather*)

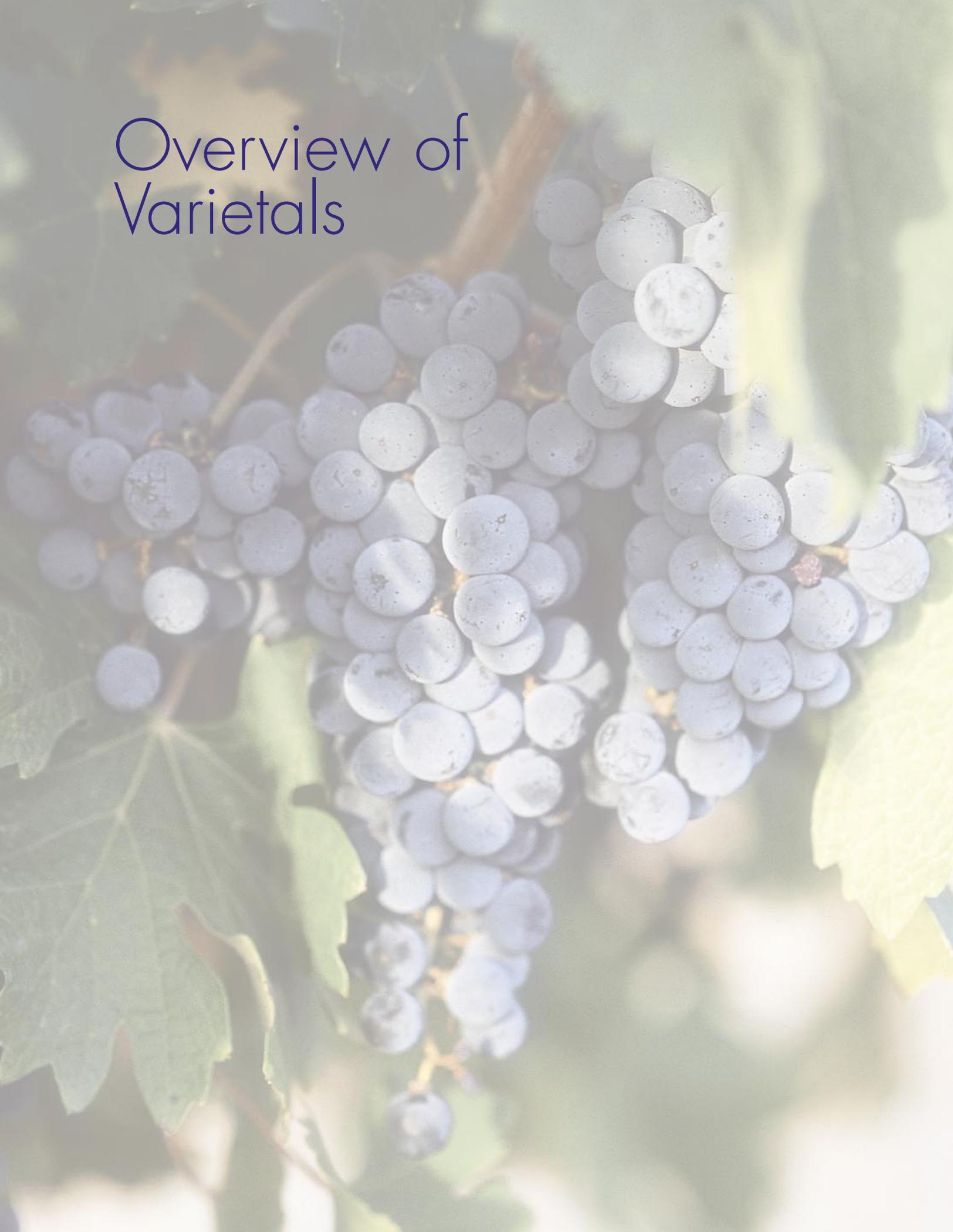
Chenin Blanc	6-8 tons per acre	Ruby Cabernet	6-8 tons per acre
Muscat Canelli	4-8 tons per acre	Zinfandel	3-7 tons per acre
Sauvignon Blanc	3-5 tons per acre	Riesling	4-6 tons per acre
Sangiovese	6-8 tons per acre	Merlot	3-6 tons per acre
Cabernet Sauvignon	2-5 tons per acre	Chardonnay	1-5 tons per acre

Texas grapes were sold at the following averages per ton in 1998, according to the Texas Wine Marketing Institute (for updated pricing, contact the Institute at (806) 742-3077):

Cabernet Sauvignon	\$1,055	Cabernet Franc	\$ 825
Chardonnay	\$1,020	Black Spanish/Lenoir	\$ 797
Sangiovese	\$1,000	Zinfandel	\$ 775
Syrah/Shiraz	\$1,000	Riesling	\$ 755
Merlot	\$ 980	Chenin Blanc	\$ 616
Sauvignon Blanc	\$ 860		



Overview of Varietals



Varietals

Vitis vinifera are classic European wine grapes producing wines with the greatest consumer demand. Most vinifera do well on the South Plains and Trans-Pecos. They are also grown in North Texas and the Hill Country, but the presence of Pierce's disease requires strategic site selection and more intensive management. When selecting a varietal, keep in mind its potential to grow in your area of the state and its marketability and profitability.

Cabernet Sauvignon

The world's leading quality red wine grape, it has vigorous vines and adapts to a range of climates and fermentation styles. Vines require many trials to determine the best canopy and production system. Does best south of Lubbock where fall freeze damage is less severe. Quality can be outstanding.

Chardonnay

Consumers love it. Chardonnay represents 24 percent of wine sold in the United States, but production in Texas is less than ideal. Cold-hardy vines do well in North Texas, but late spring freezes pose a hazard. Moderately vigorous vines require good management in the Texas heat. It's the most susceptible to Pierce's disease in Texas and the fastest to die from it.

Chenin Blanc

Vigorous and easy-to-grow, Chenin Blanc produces high quality fruit. Low prices can be offset by consistently high yields. Commonly used as a blender, it grows best in West Texas, where high tonnage results from wind tolerance and adaptation to mechanization.

Merlot

The wine's popularity is making Merlot the red grape of choice. Moderately vigorous vines have potential for high yields and overcropping. A thin berry skin susceptible to black rot demands good fungicide protection. Needs concise pruning and excellent management.

Muscat Canelli

An old Italian variety from Italy's Piedmont region sold in the United States as Asti, Muscat Canelli has vigorous vines that produce well in West Texas. Small quantities are often blended with other varietals. Makes a fruity, sparkling wine popular with new wine drinkers.

Riesling

Consumer demand is low, but quality, yield, cold hardiness and ease of mechanical pruning and harvesting make Riesling hard to rule out. Considered the best variety for North Texas.

Ruby Cabernet

Texas plantings produce high tonnage and grape quality that yield wine with excellent color. Low consumer demand relegates it to blender status.

Sangiovese

Italy's number one wine, Sangiovese has tremendous vigor that adapts well to Texas conditions. The wine can be outstanding if made carefully with ripe fruit and aged in small oak barrels.

Sauvignon Blanc

Vigorous, productive vines produce wines that don't sell as well as some, but easy growth and high tonnage make up for lower market prices. Adapts well to mechanization.

Zinfandel

Moderately vigorous Zinfandel produces a full-bodied red wine and a blush. Cold-tolerant north of Lubbock and grown successfully in West Texas.

Other *Vitis vinifera* of interest to Texas growers include Gewurtztraminer, Viognier, Syrah, Cabernet Franc, Petit Verdot and Pinot Gris.

Tolerant to Pierce's Disease:

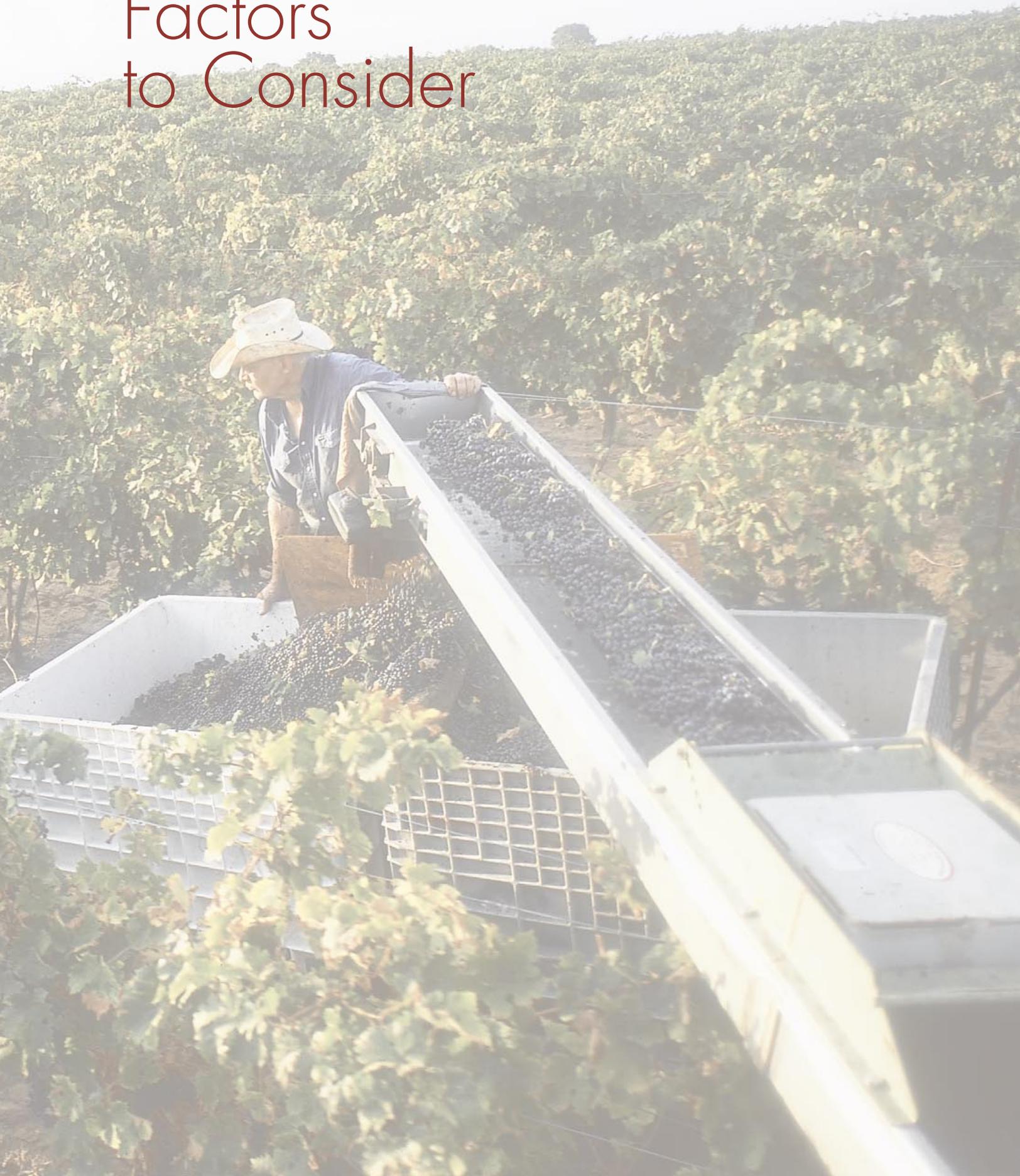
LeNoir/Black Spanish – Texas-grown since 1880, high-acid, best for Port.

Herbemont – brown grape, clear juice for white wine.

Blanc Du Bois – vigorous white, top quality only when blended with *Vitis vinifera*.

Cynthiana (Norton) – outstanding dry red wine when harvested ripe, fermented correctly and aged in small oak barrels.

Factors to Consider



Climate and Elevation

Warm days, cool nights and low humidity generally produce higher quality grapes. The most consistent high quality has come from vineyards above 3,000 feet, one exception being Chardonnay with its susceptibility to spring frost. As elevation climbs, average temperature and humidity decline. Higher elevation provides lower temperatures during ripening, enabling grapes to ripen more slowly, develop flavor and retain the necessary acidity.

Elevation in the Hill Country ranges from approximately 800 to 1,800 feet; Fort Stockton, about 2,700 feet; Lubbock, over 3,000 feet; Fort Davis, 5,000 feet.

This is not to say quality fruit is not grown at lower elevations, but Texas weather presents big challenges.

Stimulated by the heat, grapes grow rapidly, which can lead to early harvest and minimum “hang time,” giving the fruit less time to develop flavor. Warm winters and rainfall in East, South and Central Texas can also create serious cultural problems. Rainfall can cause berry splitting and prohibit tractor and sprayer passage for fungicide protection. North Texas also has risks associated with higher rainfall.

High temperatures may limit sugar production and at night will increase respiration rates, causing the fruit’s acid levels to fall rapidly. However, with proper management, most grapes can be ripened adequately.

Hot sun and summer heat does not usually damage grapes growing in the sun all season, but if grapes grown in canopy shade are suddenly exposed to sun, significant damage can result.

Areas with higher rainfall and humidity have serious problems growing grapes without significant applications of fungicides and pesticides. This is because leaf wetness encourages fungal diseases and insects tend to be more active in wetter areas.

Winter injury from freeze, frost or hail can severely damage crops. Frost can be especially damaging and is considered by some to have the greatest economic impact of any environmental factor on grape growing in Texas. Many growers are planting primarily red-fruited varieties, which generally break dormancy later than white grape varieties, leading to a reduced risk of spring frost damage.

Extreme low temperatures, especially when vines are not fully winter hardy, can cause vine damage or crop loss. While most wine grape varieties can survive undamaged below 0 degrees F when fully dormant during the winter, extreme changes in temperatures can leave vines less than hardy, possibly causing them to be injured at higher temperatures during the year’s first freeze or a late spring frost.

Choosing A Site

Choosing the right site is crucial to a vineyard's success and is the greatest single decision a prospective grower can make. Because of the risk of Pierce's disease in certain parts of the state, this should be one of the primary considerations when choosing a growing location.

If you meet certain criteria, including having a sound business plan, the Texas Department of Agriculture may be able to provide funding assistance through the Texas Agricultural Finance Authority. TAFE is a public authority within TDA that provides assistance to eligible creditworthy individuals and businesses through six financial assistance programs. Depending on the program, funds may assist with crop diversification, water conservation equipment and purchase of farmland. For more information call (800) TELL-TDA or (512) 475-1614.

Ideally, the site should be close to home. Long drives prevent optimum vineyard management. If planting grapes susceptible to Pierce's disease in an area at risk for the disease, you should clear a buffer zone of 150 feet or more around the vineyard to create an environment unfavorable to harmful insects, meaning you should be prepared to buy more land than you will plant.

Some other considerations: soil pH, drainage and structure; water volume and quality; rainfall; risks from hail, wind and disease; and marketing alternatives. Be sure to find out the likelihood of frost.

As long as soil is deep enough, a hillside or hilltop is superior to a low vineyard site. In spring, cold air drains to the lowest point. A vineyard on a slope has a better chance of surviving late spring frosts than one on flat ground or in a river bottom or depression.

Local county Extension agents can provide a county's fruit production history. The Natural Resources Conservation Service county office has information on soil types in the area.

Soil Requirements

A soil sample should be collected and analyzed for pH before buying a site. Optimum soil pH is 6.5-7.5; acceptable soil pH is 6.0-8.0. Soils below 6.0 may require incorporating high volumes of lime before planting. Those above 8.0 have problems utilizing iron and zinc and have the potential for developing cotton root rot, one of the most destructive fungal plant organisms. Cotton root rot can attack more than 2,000 plant species, including grapes.

A soil analysis to determine nutritional deficiencies is also needed before planting. For a soil analysis, contact the Texas A&M University Soil, Water and Forage Testing Laboratory at (979) 845-4816. More information is available at the laboratory's website (<http://soil-testing.tamu.edu>). Private laboratories also provide soil analysis.

Grapes require well-drained, highly aerated soil at least 2 feet deep, and preferably 4 to 6 feet deep. Deep sandy loam with some gravel is recommended. Rocky soil is better than clay, though some clay soils are acceptable. Heavy clay is not suited to root growth. Uneven soil types can be a problem.

Surface drainage is important. Because vineyards are often "clean cultivated," significant soil erosion from rainfall may occur. Grapes like "dry feet." Water standing in a vineyard reduces oxygen, which can kill the plants.

"Cross-ripping" to a depth of 4 to 6 feet is the most beneficial single soil preparation, allowing grape roots to penetrate deeply. Cross-ripping may require a 6-foot ripping shank that disrupts physical barriers such as hardpan or thin rock layers. It is not necessary with deep, sandy loam soil.

Water Needs

Grapes require approximately 24 inches of rainfall or irrigation during the growing season. Sandy soils may need more. Clay soils have greater water-holding capacity and can be irrigated longer, but less frequently, than sandy soils. Extended dry spells, especially in June or July, make irrigation a necessity.

Depending on depth and size, irrigation wells cost between \$10,000 to \$50,000. City water contains chloride and possibly sodium, ruling it out as the primary source of irrigation water.

Grapes return more dollars to growers per gallon of irrigation water than any other major crop in Texas. In Pecos County, for example, grapes require 2 acre-feet of irrigation water a year, while cotton requires 3 acre-feet and alfalfa up to 6 acre-feet.

Many irrigation systems are available, but drip is the most practical and widely used. Drip irrigation systems range from \$1,000 to \$2,000 per acre, depending on type, vine spacing and installation.

Grapes do not compete well for water and nutrients with grassy and broad-leaved weeds. Clean, cultivated vineyards will lower water consumption. In wet areas, a ground cover between grape rows may be necessary.



Chemicals

To grow grapes, Texas producers must fight a host of natural enemies. Growers in the eastern two-thirds of the state generally apply more chemicals to combat disease and insects than those in the western third, who use relatively small amounts.

Applying regulated herbicides or state-limited-use or restricted-use pesticides requires obtaining a private applicator's license from TDA. For information, call (800) TELL-TDA or (512) 936-2638 or fax (512) 463-1618.

Growing areas other than the High Plains and Trans-Pecos usually require more chemical input to control fungal diseases and limit Pierce's disease. Left unchecked, Pierce's disease can destroy a vineyard. Timely cultural practices such as removal of wild grape vines, immaculate weed control and establishing a weed-free perimeter around the vineyard will also help manage this disease.

Weed control is essential. Most annual weeds can be removed mechanically, but equipment is costly. Perennial grasses and weeds such as Nightshade can be removed with pre- and post-emergent herbicides.

Organic Production

Disease risk makes large-scale organic cultivation of wine grapes difficult, if not impossible, in 95 percent of the state.

Diseases, Pests and Other Foes

Pierce's Disease

The most serious threat to wine grapes in Texas, California and other growing areas is Pierce's disease, which has caused millions of dollars in losses since the 1990s. Pierce's disease occurs in all areas of Texas that do not have severe winters and has attacked vineyards in every region but the South Plains. Before growers consider other crucial economic factors, they must understand the risk from Pierce's disease, which can wipe out a vineyard. Currently, there is no preventative or curative treatment for it.

Efforts to reduce the risk of Pierce's disease include controlling the glassy-winged sharpshooter and other xylem-feeding insects that spread the bacterium causing the disease. Site selection away from rivers, ponds and creeks, good habitat management and chemical control help prevent the pathogen's spread. Imidacloprid, a new chemical approved for use in Texas, has shown excellent results in controlling glassy-winged sharpshooters when applied through a drip irrigation system. Vines pick up the chemical at the root, preventing harm to beneficial insects in the vineyard. Although a large research effort is underway to discover methods for controlling Pierce's disease, it will probably be a long time, perhaps 10 years or more by some estimates, before a practical, effective solution is available.

Fungi and Viruses

Powdery mildew, downy mildew, black rot, cotton root rot and bunch rot are among the fungal diseases found in Texas vineyards. Powdery mildew occurs in all parts of Texas, but is more common in West Texas. Downy mildew prefers a cool, humid environment, thriving during a cool, wet spring or fall. It is prevalent in Southeast Texas and appears in other areas during extended periods of high humidity. Black rot thrives in areas of heat and high humidity including North, East, Southeast and Central Texas. Cotton root rot is significant in areas with high pH alkaline soils, such as Central Texas, but it is not a problem in East Texas or on the South Plains. Bunch rot can be a serious problem in any vineyard when rainfall occurs just before or during harvest.

Numerous viral diseases result in less vigor and productivity.

Pests

Leafhoppers, flea beetles, grasshoppers, caterpillars, worms, nematodes, birds, rabbits, deer, raccoons, opossums, porcupines and many more pests like nothing better than a vineyard. Deer, rabbit and varmint-proof fencing is needed everywhere except the South Plains and parts of the Trans-Pecos. Growers should estimate \$3.50 a linear foot to deer-proof a new site.



Labor Issues

Wine grapes are one of the most intensively managed crops, and most of the work is not done from the seat of a tractor. Growing grapes requires far more work and training than most people imagine.

A vineyard's first 2 to 3 years are especially labor-intensive and include planting and training vines. One full-time person is needed for 2 to 5 acres during this period. Afterwards, one full-time person can handle 20 to 30 acres, assuming the necessary equipment is available. Seasonal activities will require more workers and trained labor is costly and not always available. Depending on grape variety, hand-harvesting costs \$75 to \$400 a ton.

At large vineyards, mid-level supervisors oversee specific production areas or activities such as irrigation. They must have vineyard experience and training in pesticide use and other worker safety issues. Manual workers need job training and experience, as well as Worker Protection Standard and pesticide training. Equipment handlers require additional safety training.

Labor is the main reason many small vineyards have lower returns and why the trend is toward mechanization. But even mechanized vineyards require physical labor. For example, a High Plains grower with a 100-acre vineyard employs five full-time workers from February to mid-September.

A new mechanical harvester costs between \$85,000 to \$175,000 or more. Harvesters can also be rented from California. Several growers located nearby can also look into the possibility of pooling their resources to share equipment. Custom harvesting costs between \$200-\$300 or more an acre.

Education and Training

Training in wine grape production – viticulture – is vital for consistent grape quality and quantity. A vineyard owner or manager should have field experience or formal education in wine grape production supplemented with continuing education.

Currently, viticulture classes are taught at Grayson County College in Denison. Texas Cooperative Extension agents also conduct educational events annually in several growing areas of the state. The Texas Wine and Grape Growers Association (TWGGA) plans to work with community colleges to develop more training programs and short courses. TWGGA also holds educational programs at its fall Harvest Festival and its February Grape Camp in Junction.

Some out-of-state training is also available, including distance learning via the Internet.



Weighing the Opportunities



Pros and Cons

As you consider growing wine grapes after reading the *Texas Wine Grape Guide*, here's a checklist of Pros and Cons.

Pros

-  The Texas wine industry is well established, contributing \$100 million to the state's economy.
-  Wine sales in Texas are currently \$500 million a year and the market is growing.
-  Land is available for about \$1,000 to \$4,000 an acre in some of the state's best grape-growing areas.
-  A new state law is easing restrictions against selling and shipping wine to dry areas of Texas, which should increase demand.
-  Financing for vineyard start-up costs may be possible through the Texas Agricultural Finance Authority.
-  Diversifying into new crops such as wine grapes has potential to offer added income.

Cons

-  Vineyard cultivation requires significant investments of time and money.
-  Vineyard cultivation is labor-intensive and labor shortages may be a potential issue.
-  Texas vineyards face formidable weather challenges – heat, intense sunlight, unwanted rainfall, early fall freezes, late spring frosts, hail and wind.
-  Pierce's disease, viruses, fungi and pests must be battled for success. Pierce's disease, in particular, may be an insurmountable problem in some areas.

Other Opportunities

Texas grape and wine production has led to a thriving tourist industry, particularly in the Hill Country and Grapevine, which hosts the Southwest's largest wine festival in September. Vineyards can piggyback on the industry's appeal by holding harvest festivals and events and celebrating Texas Wine Month in October. They can also partner with nearby wineries in sponsoring festivals and wine trails.

Opening a bed and breakfast can provide a vineyard with additional income. Nature tourism is drawing city residents to the country for relaxed weekends and longer vacations. These trips may also include learning, such as educational tours of vineyards and wineries.

GO TEXAN.

Launched by Agriculture Commissioner Susan Combs, GO TEXAN adds a new dimension to marketing Texas agriculture. The campaign promotes Texas food, wine, fiber and horticulture under one easily recognizable trademark: a glowing brand in the shape of Texas.



GO TEXAN.

Producers of viticultural products such as wine grapes in their natural or processed state that have been produced, processed, or otherwise had value added in Texas are eligible for membership. Wine must be 75 percent by volume derived from grapes grown and fermented in Texas and must be fully produced and finished in Texas.

Resources



Sources and Resources

Look for more information on growing wine grapes in Texas, the Texas wine industry and related subjects at:

Texas Wine Grapes, Texas Cooperative Extension (winegrapes.tamu.edu): extensive information on research, pests, diseases, grape publications and other topics of interest to prospective grape growers.

Texas Wine and Grape Growers Association (www.twgga.org) 701 S. Main, Grapevine, Texas 76051, (817) 424-0570, fax (817) 251-4329: organization of growers and winemakers promoting Texas grape and wine production through educational, marketing and legislative activities.

Texas Wine Marketing Research Institute at Texas Tech University (www.hs.ttu.edu/TexasWine/default.asp): fosters the economic development and growth of the Texas wine and wine grape industry, collects and disseminates information and does research on industry-related topics.

Texas Wine Trails (www.Texaswinetrails.com): provides information on Texas wines and wineries, wine trails and events.

Wine Lovers Page (www.wine-lovers-page.com): lists dozens of books about growing wine grapes and making wine. Included are brief descriptions of the books and their prices. Click on the Kellgren Wine Book Catalog.

The Wrath of Grapes, Lewis Perdue, Avon Books: an inside look at the wine industry and its challenges.

Texas Wineries

Alamosa Wine Cellars
Bend
(915) 628-3313

Becker Vineyards
Stonewall
(830) 644-2681

Bell Mountain Vineyards
Fredericksburg
(512) 685-3297

Blue Mountain Vineyards
Fort Davis
(915) 426-3763

Cana Cellars
Austin
(512) 288-6027

Cap*Rock Winery
Lubbock
(806) 863-2704

Chisholm Trail Winery
Fredericksburg
(830) 990-2675

Comfort Cellars Winery
Comfort
(830) 995-3274

Cross Timbers Winery
Grapevine
(817) 488-6789

Delaney Vineyards
Grapevine
(817) 481-5668

Dry Comal Creek Vineyards

New Braunfels
(830) 885-4076

Fall Creek Vineyards

Austin
(512) 476-4477

Fredericksburg Winery

Fredericksburg
(830) 990-8747

Grape Creek Vineyard

Stonewall
(830) 644-2710

Haak Vineyard and Winery

Santa Fe
(409) 925-1401

Hidden Springs Winery

Pilot Point
(940) 686-2782

Homestead Winery

Ivanhoe
(903) 583-4281

Kiepersol Estates

Tyler
(903) 894-8995

La Bodega Winery

DFW Airport, Dallas
(972) 574-1440

La Buena Vida Vineyards

Grapevine
(817) 481-9463

Llano Estacado Winery

Lubbock

(806) 745-2258

Lone Oak Vineyards

Valley View

(940) 637-2612

McReynolds Wines

Cypress Mills

(830) 825-3544

Messina Hof Winery & Resort

Bryan

(979) 778-9463

North Star Winery

Grapevine

(817) 410-2675

Pheasant Ridge Winery

Lubbock

(806) 746-6033

Pillar Bluff Vineyards

Lampasas

(512) 556-4078

Piney Woods Country Wines

Orange

(409) 883-5408

Pleasant Hill Winery

Brenham

(979) 830-8463

Poteet Country Winery

Poteet

(830) 276-8085

Red River Winery
Spring
(281) 288-9463

Sister Creek Vineyards
Sisterdale
(830) 324-6704

Slaughter Leftwich Vineyards
Austin
(512) 266-3331

Spicewood Vineyards
Spicewood
(830) 693-5328

Ste. Genevieve Wines
Fort Stockton
(915) 395-2417

Texas Hills Vineyard
Johnson City
(830) 868-2321

Val Verde Winery
Del Rio
(830) 775-9714

Wimberley Valley Winery
Driftwood
(512) 847-2592

Woodrose Winery
Stonewall
(830) 644-2111

(This list is subject to change as new wineries open. Check the GO TEXAN website at www.GOTEXAN.org and follow the links to TDA's Texas wine website for the most up-to-date contact information for Texas wineries.)

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Texas Wine Marketing Research Institute, Lubbock



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