W 895-E

SELECTING GRAPES FOR RESIDENTIAL PRODUCTION IN TENNESSEE

Natalie Bumgarner, UT Residential and Consumer Horticulture Extension Specialist, Department of Plant Sciences
David Lockwood, Fruit Crop Specialist, Department of Plant Sciences
Melody Rose, UT Extension Agent, Greene County
Gregg Upchurch, UT Extension Agent, Cumberland County

Growing table and wine grapes in your own backyard can be rewarding. However, grapes are a long-term investment requiring crop knowledge and detailed management for good production and fruit quality. So, it is important for the home grower to understand some key points about different grapes and their suitability for residential growing in the southeast. Selecting the right grape requires understanding of grape types and varieties (cultivars), climate requirements and knowledge of management practices such as timely and consistent pruning, training, fertilization, and pest and disease management.

Many home fruit growers are interested in growing grapes for wine. However, humid southeast climates are much more challenging for traditional wine grapes than the western U.S. American and French-American hybrid grapes are better suited to survive both Tennessee winters and growing season diseases as well as being more productive. Muscadines also are an option in warmer parts of the state.

After choosing the type of grape, selecting cultivars with resistance to common diseases is important to enable successful crop harvests. Resistance should be used in conjunction with good cultural practices and a carefully managed spray program. Recent breeding efforts are providing access to more disease resistant cultivars, but all grapes require dedicated attention to pruning, training, and disease control for high quality crops. It is important to note that resistance does not mean immunity!

SELECTING THE BEST SITE

Site selection is critical, but residential siting options can be limited. Try to consider the following:

- Grapes require locations with full sun to support plant productivity and health.
- Planting on a site that is higher in elevation than immediate surroundings will provide some protection during mild frost events because cold air can drain away from the plants.
- Eastern facing sites are ideal to support leaf drying early in the day to lower disease risk.
- Soils should be well-drained, both on the surface and internally.
- Soils should offer a minimum rooting depth of 30 to 36 inches for vines. Shallow soils are more prone to drought and waterlogging. Roots close to the soil surface are more prone to cold injury over the winter months. Vines on shallow soils will be smaller, weaker, less productive and shorter-lived.
- Soil pH should be between 6.0 and 6.5.
- Highly fertile soils are not desirable for grape growing, as they promote excess vine vigor and excess shading within the canopy resulting in increased disease pressure, poorer fruit color and lower soluble solids levels in the fruit.

SELECTING GRAPES FOR TENNESSEE CLIMATES

The four types of grapes commonly grown in the United States are:

- European bunch grapes (*Vitis vinifera*)- are used most commonly in wine production. Many seedless table grapes are also *V. vinifera*. Lack of sufficient cold hardiness, disease and pest susceptibility and low yield potential makes them poor choices for Tennessee home growers.
- American bunch grapes (*V. labrusca, V. aestivalis*) are commonly used as table grapes as well as for juice, jelly, and some wines.
- French-American hybrids are *V. vinifera* crossed with one or more of the American bunch grapes. This hybridizing means they have fewer pest and climate limitations for our region than European bunch grapes. Both American bunch and French-American hybrids offer more opportunities for success for residential growers for home wine or table grape growing.
- Muscadine (*V. rotundifolia*) grapes are the fourth type and are native to the southeastern U.S. Due to their small cluster size, they are not considered to be bunch grapes. They often have larger berries and tend to ripen later in the fall than most bunch grape cultivars. However, in Tennessee, cold injury during winter can damage muscadines across much of the eastern and northern/higher elevation parts of the state.

Table 1. Comparison of key traits for different types of grapes.

	European bunch (*v. vinifera*)	**American bunch (*V. labrusca, V. aestivalis)***	**French American hybrids**	**Muscadines (*V. rotundifolia*)**
Cold Tolerance: The ability of dormant grapevine tissues to survive cold temperatures during autumn and winter is often expressed as the temperature that causes mortality of 50% of primary buds in mid-winter. However, this cold tolerance does not necessarily protect from future injury due to drastic temperature fluctuations Tennessee experiences.	Winter hardiness is an issue limiting production in TN.	Good winter hardiness for Tennessee climates.		Winter hardy in southern parts of TN. Vines can be killed back if temperatures drop below 10°F.
Plant characteristics (growth, bearing, pest susceptibility): Phylloxera (*Daktulosphaira vitifoliae*) is an aphid-like insect native to North America that is parasitic to Vitis species. Pierce's disease (*Xylella fastidiosa*) is a bacterial disease spread by leaf-hopper insects that can kill vines and reduce production. It is mainly an issue in the warmer southern growing regions.	Not recommended for homeowners in TN because winter hardiness is a concern in parts of Tennessee. Disease issues are also a threat. Grafting is needed to avoid Phylloxera. Susceptible to Pierce's disease in areas where an issue.	Good winter hardiness with later spring bud break. Species native to the northeast US often do not show resistance to Pierce's disease. Diligent disease management is still required.	Better winter hardiness than *V. vinifera*, so best home wine grape option for TN. Increasing range of pest and disease resistances. Pierce's disease has been an issue on some cultivars and close disease management is still required.	Not usually susceptible to Pierce's disease, downy mildew, or botrytis bunch rot. Can suffer from powdery mildew, bitter rot, and black rot. Larger vines require wider spacing. Thicker skin and native origin reduce disease risk, so low spray management is more possible.
Grafting and rootstock use:	Grafted plants are used to provide resistance to the insect pest Phylloxera and some nematodes.	Usually grown on their own root system. However, some cultivars grown on grafted rootstocks can benefit from increased vigor. Many newer hybrids are being recommended grown on rootstocks.		
Pollination requirement:	Self-pollinating			Some cultivars have perfect flowers. Others have female flowers requiring cultivars with perfect flowers for pollination.
Fruit characteristics and uses: Fruit can be seeded or seedless. Additionally, skins can easily separate from pulp (slipskin) or be more difficult to separate (non-slipskin).	Under appropriate climates, these grapes are desired for the highest quality wines due to their sugar/acid balance. These grapes are typically seeded.	Used for juice, jelly, table, and some wines. Produce distinctive (often termed foxy as *V. labrusca* are known as fox grapes) and flavorful juice. Usually slipskin.	Properly managed, these grapes are used in the making of high-quality wine as well as fresh eating and juice. Can be seedless or seeded and slipskin or non-slipskin.	Larger individual grapes with typically thicker skin, and musky flavor/aroma. Cultivars for wine usually have smaller fruit, while fresh eating cultivars have larger fruit with more tender skin.

Table 2. Bunch Grape Wine Cultivars in Tennessee (*V. labrusca, V. aestivalis, V. vitus hybrids*)

Green shading represents cultivars which may reduce disease issues or enable fewer sprays and lead to a higher opportunity for success (less difficult to produce well). Yellow shading represents cultivars with more disease susceptibility, while red shading represents cultivars with disease susceptibility or cultural needs that will often lead to poor success in residential production in Tennessee. These colors should be interpreted as general guidelines as all cultivars have not been trialed in Tennessee.

Name	Type	Cultivar Description	Fruit Uses	Difficulty	Harvest season
Arandell	Hybrid	A dark red fruited grape released by Cornell in 2013 from their low/no spray trials. Medium vigor vine that can be grown on its own roots, but grafting can increase yield. Moderately winter hardy. Good resistance to powdery mildew, downy mildew, and botrytis. Moderate resistance to black rot. Moderate cluster size. Suggested only for trial due to recent introduction. Local grower feedback suggests grafting is useful and wine quality is variable.	Wine (red)	Moderate	Mid
Aromella	Hybrid	A relatively recent white wine grape release with good productivity and aromatic qualities more similar to muscat. 'Traminette' is a parent. Usually grown on its own roots and are very winter hardy. Medium resistance to common leaf diseases but botrytis can be an issue even though loose clusters slow spread. Suggested only for trial due to recent introduction.	Wine (white)	Moderate	Mid
Catawba	American	Red, medium-sized berries with a good aroma. Vigorous and reasonably hardy cultivar that has been in use since the early to mid-1800s. Good heat tolerance. May actually be a naturally occurring hybrid of *V. labrusca x vinifera*. Leaves tend to be susceptible to fungal diseases.	Juice, wine (red), table	Moderate	Mid-Late
Cayuga White	Hybrid	Pale green grapes in large clusters on vigorous, hardy vines. Medium to large berries on large clusters. 1970s release from Cornell breeding program. Local growers suggest it can be sensitive to the growing environment.	Wine (white)	Moderate	Mid
Chambourcin	Hybrid	Main French-American hybrid used for red wine production. Bluish grape on a moderate vigor vine that benefits from short spur pruning and can benefit from grafting. Good resistance to some fruit rots and leaf diseases. Local growers report good tolerance to downy mildew but challenges with birds.	Wine (red)	Moderate	Late
Chardonel	Hybrid	Chardonnay x Seyval Blanc cross released from Cornell program in the 1990s that produces a yellow/green fruit. Productive and hardy vine.	Wine (white)	Moderate	Late
Corot Noir	Hybrid	A red grape with good productivity and slight susceptibility to common leaf and fruit diseases. Generally grown on its own roots. Developed in Cornell breeding program. Budbreak is relatively late and hardiness is reported to be good in comparison to other French American hybrids. May be challenging in Tennessee climates.	Wine (red)	Moderate	Mid
Cynthiana (Norton)	American	Small blue to black berries in small clusters on hardy vines. Cultivar is likely from a native species called V. aestivalis that may have hybridized with *V. vinifera*. Reported to have good leaf disease tolerance and may have some Pierce's disease resistance. Not high producing but can make good quality wine.	Wine (red)	Low	Late
Delaware	American	Small blue fruit on hardy vines that tend to grow slowly. The fruit flavor is mild and can be used as a dessert-type grape or more commonly in wine. Mild flavor for a *V. labrusca*. Good management is required for optimum yields. Grafting can improve performance.	Table, wine (red)	Moderate	Early-Mid
Enchantment	Hybrid	A release from U. of Arkansas in 2016. This red grape has red flesh as opposed to white flesh. Wine quality has been described as Vinifera-like. Suggested only for trial due to recent introduction.	Wine (red)	Moderate	Early-Mid
Fredonia	American	Blue to black Concord type seeded grape with a very good flavor and quality from the 1900s. Large fruit has a unique flavor. Has good cold hardiness but careful management is needed to maintain yield.	Table, juice, wine (red)	Moderate	Early
Niagara	American	Golden/white large fruit with low acidity on large clusters that can be vigorous and productive. One of the few native grapes commonly used in the eastern wine industry. Good cold hardiness and heat tolerance. Can have issues with black rot.	Table, juice, wine (white)	Moderate	Mid-Late
Noiret	Hybrid	A red grape with moderate resistance to leaf diseases and bunch rot. Can be a good alternative to Chambourcin. Developed in Cornell breeding program. Winter hardiness is similar to other hybrids such as Cayuga White. Grafting can increase vigor and lifespan.	Wine (red)	Moderate	Early-Mid
Opportunity	Hybrid	A green to white grape cultivar released from U. of Arkansas in 2016. Likely to have some resistance to powdery and downy mildew. Tight clusters that can be suceptible to fruit rot. Suggested only for trial due to recent introduction.	Wine (white)	Moderate	Mid
Seyval Blanc	Hybrid	Yellow fruit on a moderately vigorous vine that can benefit from grafting. Produces many buds, which can lead to overcropping because secondary buds are also fruitful. Moderately cold hardy with large, tight bunches can be susceptible to fruit rots.	Wine (white)	Moderate	Early
Steuben	American	Large blue fruit on medium to large, compact clusters. Fruit is very round with an interesting flavor and aroma that is commonly used in rose wines. Vines are hardy, productive, and vigorous. Released by Cornell in the 1940s.	Table, juice, wine (red)	Moderate	Early- Mid
Sunbelt	American	Concord type dark blue grape that is earlier and more even ripening but may not be as productive. Vines are hardy with good vigor and leaf cover. The tougher skins may reduce bird damage. Very good all-purpose for home production. 1990s release from the University of Arkansas.	Table, juice, jelly, wine (red)	Low	Mid

Table 2. Bunch Grape Wine Cultivars in Tennessee (*V. labrusca, V. aestivalis, V. vitus hybrids*) CONTINUED.

Green shading represents cultivars which may reduce disease issues or enable fewer sprays and lead to a higher opportunity for success (less difficult to produce well). Yellow shading represents cultivars with more disease susceptibility, while red shading represents cultivars with disease susceptibility or cultural needs that will often lead to poor success in residential production in Tennessee. These colors should be interpreted as general guidelines as all cultivars have not been trialed in Tennessee.

Traminette	Hybrid	White fruited grape with moderate foliage and fruit resistance to powdery mildew, black rot and botrytis. Yields are very good with high fruit quality. Hybrid developed in Cornell breeding program. Good cold hardiness and a later bud break to avoid spring frosts. Local growers suggest that grafting is best to protect from phylloxera.	Wine (white)	Moderate	Mid-Late
Villard Blanc	Hybrid	Green to yellow berries in loose clusters. Vine with some resistance to Pierce's disease. Large loose clusters. Spur pruning is suggested. In use since the 1930s.	Wine (white)	Moderate	Late
Vidal Blanc	Hybrid	Yellow fruit on a productive and cold hardy vine with a late bud break. Yields tend to be good but thinning may be required to prevent overcropping. Has been noted to be susceptible to Pierce's disease.	Wine (white)	Moderate	Late
Cultivars not recommended for growing in TN due to difficulty in management: - Concord, though quite popular since the 1950s, is not recommended for our region due to uneven ripening habit. - Merlot, Cabernet (sp) Franc, Cabernet Sauvignon and other common *V. vinifera* cultivars due to disease and climate limitations.					

Table 3. Bunch Table Grape Cultivars in Tennessee (*V. labrusca, V. aestivalis,* hybrids)

Table Grapes are grown to be consumed while fresh. They have less acidity and sugar than wine grapes. Eastern table grapes are hybrids of European and American grapes more adapted to our humid climates. Some grape varieties such as Niagara, Delaware, and Sunbelt are considered to be suited for wines, processing, and fresh eating and were described above. Table grapes are often differentiated from wine grapes by having larger berries and a lack of seeds. Many table grapes are non-slipskin but a few are slipskin as denoted below.

Green shading represents cultivars which may reduce disease issues or enable fewer sprays and lead to a higher opportunity for success (less difficult to produce well). Yellow shading represents cultivars with more disease susceptibility, while red shading represents cultivars with disease susceptibility or cultural needs that will often lead to poor success in residential production in Tennessee. These colors should be interpreted as general guidelines as all cultivars have not been trialed in Tennessee.

Name	Type	Cultivar Description	Difficulty	Harvest season
Everest	Hybrid	Seedless dark blue Concord type table grape with very large fruit on large clusters developed primarily for fresh eating. Released from Cornell in 2018 with American and Japanese grape parentage. Moderate resistance to powdery and downy mildew. Very good cold hardiness. Suggested only for trial due to recent introduction.	Low	Mid
Faith	Hybrid	This is a blue to red seedless grape from the U. of Arkansas breeding program in 2012. The large fruit is non-slipskin with good crispness on a vine that is vigorous and has good yield.	Moderate	Early-Mid
Gratitude	Hybrid	A green seedless grape that has a very crisp texture and is non-slipskin. The fruit is oval/elliptical for a nice visual appeal. Reported to have medium vigor and good yields and winter hardiness should be observed. Released from the U. of Arkansas breeding program in 2012.	Moderate	Mid
Hope	Hybrid	A light green seedless grape with a fruity flavor that has a soft texture and is non-slipskin. The fruit is oval/elliptical for a nice visual appeal. Reported to have medium vigor and good yields. Released from the U. of Arkansas breeding program in 2012.	Moderate	Mid
Joy	Hybrid	A dark red to blue grape with medium sized clusters and berries with a nice fruity flavor and soft texture. Released from the U. of Arkansas breeding program in 2012.	Moderate	Early-Mid
Jupiter	Hybrid	Red to blue seedless (has some seed traces) berries in medium to large clusters with mild flavor somewhat similar to muscat. Non-slipskin fruit with a moderately crisp texture that does not crack easily. Hardy plants with moderate vigor. University of Arkansas released in 1990s.	Moderate	Early-Mid
Mars	Hybrid	Blue seedless berries that are medium-sized and sweet. Thick slipskin berries can hold well on the vine. Vines can be so vigorous they often overbear, so thinning may be needed. Late blooms can sometimes escape spring frost damage. Can perform well in humid areas and reported to be disease resistant. University of Arkansas release from the 1980s.	Low	Mid
Marquis	Hybrid	White seedless, round fruit is slipskin and high quality on a productive vine. Skin can be tough but does soften as fruit ripens. Good taste and cold hardiness and well-suited to home production. Typically grown on its own roots. 1990s release from Cornell.	Moderate	Early- Mid
Neptune	Hybrid	Large green to white fruit with good flavor are produced on large and loose clusters. Vine has moderate vigor and is reported to be relatively disease resistant and hardy. Released by the Univ. of Arkansas.	Moderate	Mid
Reliance	Hybrid	This cultivar produces a red seedless grape that is relatively small with good flavor. The fruit is slipskin with a relatively thin skin that can crack. Vines are cold hardy with moderate vigor and some resistance to diseases. Released by the University of Arkansas.	Low	Early

Table 3. Bunch Table Grape Cultivars in Tennessee (*V. labrusca, V. aestivalis,* hybrids) CONTINUED

Green shading represents cultivars which may reduce disease issues or enable fewer sprays and lead to a higher opportunity for success (less difficult to produce well). Yellow shading represents cultivars with more disease susceptibility, while red shading represents cultivars with disease susceptibility or cultural needs that will often lead to poor success in residential production in Tennessee. These colors should be interpreted as general guidelines as all cultivars have not been trialed in Tennessee.

Thomcord	Hybrid	This is a seedless blue non slipskin grape developed by the USDA as a cross between Thompson Seedless and Concord. The fruit is mild and sweet with a good flavor. Reported to be productive in hot and humid areas but recommended for trial only at this time due to recent introduction.	Moderate	Late
Vanessa	Hybrid	This blue to red seedless grape is a non slipskin fruit that is large with good sweetness. It has been reported to be resistant to cracking as well as winter hardy and disease resistant.	Low	Early
Venus	Hybrid	Blue to black slipskin that performs well in southern climates. There is a flavor tendency toward muscat and while seedless it can have traces. Moderate vigor and some disease resistance is reported. University of Arkansas release from the 1970s.	Moderate	Early

Table 4. Muscadine Grape Cultivars in Tennessee (*V. roundtifolia*)

Green shading represents cultivars which may reduce disease issues or enable fewer sprays and lead to a higher opportunity for success as long as they are grown in climatic regions of Tennessee appropriate for muscadines. Yellow shading represents cultivars with more disease susceptibility or lower productivity that will often lead to poor success in residential production in Tennessee. These colors should be interpreted as general guidelines as all cultivars have not been trialed in Tennessee.

Name	Cultivar Description	Difficulty	Fruit Uses	Pollination notes	Harvest season
Carlos	Bronze fruit is small to medium in size. Commonly used for wine and juice. Skin can be tough and bitter, which limits fresh eating. Some issues with fruit rots. Most commonly grown muscadine wine grape in Tennessee. Good cold hardiness when fully dormant but early budbreak can lead to spring frost damage.	Low	Wine, juice	Self-fertile	Late
Doreen	Bronze fruit is small to medium in size that is rather oblong shaped. Vigorous and productive with reported good disease resistance and cold hardiness.	Low	Wine, juice	Self-fertile	Mid-Late
Noble	Dark red fruit is small to medium in size. This is a very common cultivar for wine and juice. Good cold hardiness. Reported as productive and disease resistant.	Low	Wine, juice	Self-fertile	Mid
Nesbitt	Dark fruit that is large in size. Bred in North Carolina. Fruit ripens over several weeks and is commonly used for fresh eating. Reasonably cold hardiness. Reported as disease resistant with low fruit rots. Skin can be tough. Good option for home growing.	Low	Table	Self-fertile	Mid-Late
Paulk	Recently (2017) released red fruited cultivar from the University of Georgia. The parents are 'Supreme' and 'Tara' and the fruit is reported to be large and of good quality with good yield capacity. Suggested for trial only as little is known about performance in Tennessee.		Table	Self-fertile	Mid
Ruby Crisp	Red fruited cultivar with very good taste, very high sugar levels and low muscadine aroma. Non-slipskin with a texture more similar to bunch grapes. Good for home production with high yields. Some berry rots. Relatively new release from University of Georgia breeding program. Suggested only for trial due to recent introduction.	Low	Table	Self-fertile	Mid
Scuppernong	Bronze fruited cultivar that is the oldest named muscadine (sometimes confusingly used to describe all bronze muscadines). Not recommended due to the many better, newer options with higher yield potential. Female flowered.	Moderate	Wine, juice	Female	Mid
Summit	Bronze to slightly pink fruit is large. Commonly used for fresh eating and may be considered a replacement for Fry. Good winter hardiness. Reported to have reasonable disease resistance and have lower fruit rot than Fry.	Low	Table	Female	Mid
Tara	Large bronze-fruited cultivar with good flavor and sweetness and a dry stem scar. Yields are usually high. Reported to have good fruit rot resistance.	Low	Table, juice, wine	Self-fertile	Early
Triumph	Bronze to pink fruit is medium in size with good flavor, sugar content and texture. Commonly used for fresh eating. Good cold hardiness and high yields. Reported as disease resistant.	Low	Table	Self-fertile	Early

REFERENCES

Cultivar information from recent Extension publications in the southeast was used to develop these tables.

https://smallfruits.org/files/2020/03/2020-Muscadine-Integrated-Management-Guide.pdf

https://grapes.ces.ncsu.edu/popular-muscadine-cultivars-in-north-carolina/

https://muscadines.caes.uga.edu/cultivars.html

REFERENCES (CONTINUED)

Cultivar information from recent Extension publications in the southeast was used to develop these tables.

http://www.hort.cornell.edu/reisch/grapegenetics/grapeinfo.html

Extension videos/resources on home vineyards:

Home vineyard pruning overview: https://youtu.be/TKi8fdjAF0o

Cane renewal pruning demo: https://youtu.be/5bNytonoEh4

Spur pruning demo: https://youtu.be/5DYPkCzhx9Q

Potential Suppliers:

UT Extension list of suppliers by cultivar for a range of fruit crops: tiny.utk.edu/FruitSupplierList

UTIA.TENNESSEE.EDU

Real. Life. Solutions.™

W 895-E 01/25 24-0146 Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development. University of Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating. UT Extension provides equal opportunities in programs and employment.