

# Table Grape Production

David W. Lockwood

Plant Sciences

Univ. of Tennessee

# What is a “Table Grape?” (Wikipedia)

- Grapes most sold as table grapes are:
  - Sultana (Thompson Seedless), Flame, Muscat, Almeria and Concord
- Primary use is for fresh consumption
- May have other uses:
  - Raisins
  - Juice
  - Wine
  - Other processing

# Table Grapes



- Thin skin so that you can easily bite into them
- no seeds or very small seeds
- focus with wine grapes is producing a smaller number of high-quality grapes,
- higher yield is a major goal for table grapes.

# Table Grapes

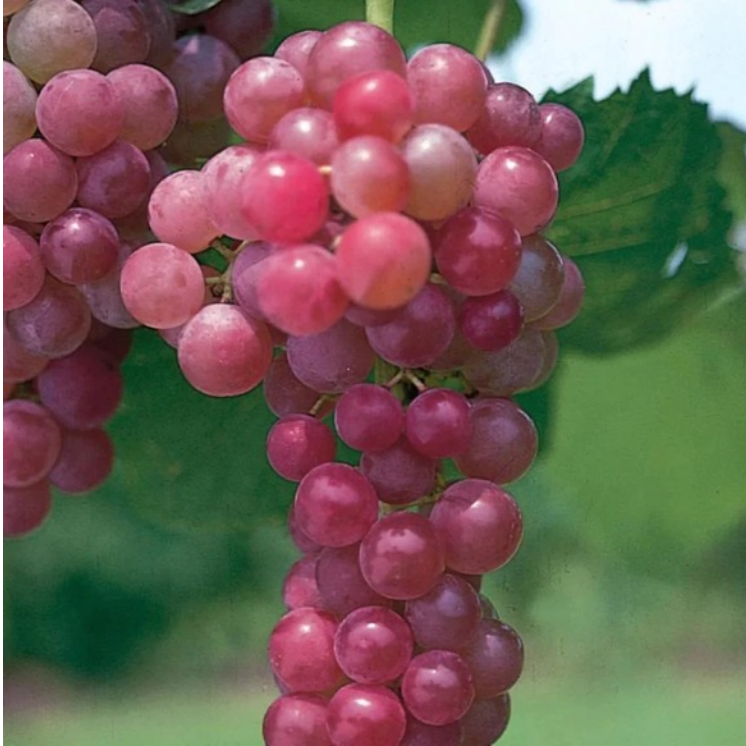
- Most table grape production worldwide is based on *Vitis vinifera*
  - this species lacks the cold hardiness and disease resistance that makes growing it viable in most states east of the Rocky Mountains.
- Eastern table grapes are interspecific hybrids of *V. vinifera* and another American grape species, most often *Vitis labrusca*.
  - *Vitis labrusca* grapes have a pulp that does not adhere to the skins (slipskin)
    - most well-known *V. labrusca* cultivar is 'Concord'
  - berry texture is not crisp and is very different than that *V. vinifera* table grape cultivars.

# Thompson Seedless Grape

- *Vitis vinifera*
- Most widely planted white table grape grown in California
  - >10,000 ha grown for table grape use in CA
- Most versatile grape variety
  - ~ 70% for raisins
  - ~ 14.5% for table
  - ~ 14% for wine, juice, distillation
  - ~ 1.5% for canning



# Flame Seedless



- The Flame Seedless (*Vitis vinifera*)
  - hybrid of Thompson Seedless, Cardinal, and several other *Vitis vinifera* cultivars
  - heavy-bearing table grape cultivar
  - keeps well in storage
  - produces large clusters of medium-large red grapes with a sweet flavor.
  - Vigorous vine
    - requires a long growing season

# Table vs. Wine Grapes

- Table:

- Larger berries
- May be seedless
- Thicker pulp
- Thinner skins
- Not as sweet
- Often non-slipskin

- Wine:

- Small berries
- Many seeds
- Thicker skins
- Higher juice content
- Slipskin

Table grapes and wine grapes may be the same variety.  
Table grapes are often harvested earlier than wine grapes.

# Slipskin vs. non-slipskin berries

- Slipskin:
  - Skin of the berry separates readily from the pulp when ripe.
  - Tends to be more juicy
- Non-slipskin:
  - Skin of berry adheres to the pulp.
  - Pulp may be firm, crunchy



# How do you get seedless fruit?

## **Parthenocarpy**

- Development of a fruit without of the ovule
  - Banana
  - Some figs
  - Some persimmons

## **Stenospermocarpy**

- Production of abortive incompletely developed seeds with normal development of the berry



# Seed Traces in Grapes

- Degree of seedlessness varies among seedless varieties
  - Most have seed traces that:
    - Vary in size from very small to large & noticeable
    - Vary in hardness of seed coats
  - Climate affects seed trace size
    - Concord Seedless produces fully developed seeds in warm years



# Wine vs. Table Grape Trellising

## Wine grapes

- grown with vertical trellises which help to manage the foliage and grape exposure to the sun
  - helps to concentrate the flavor by its growth
  - managing vine vigor is very important

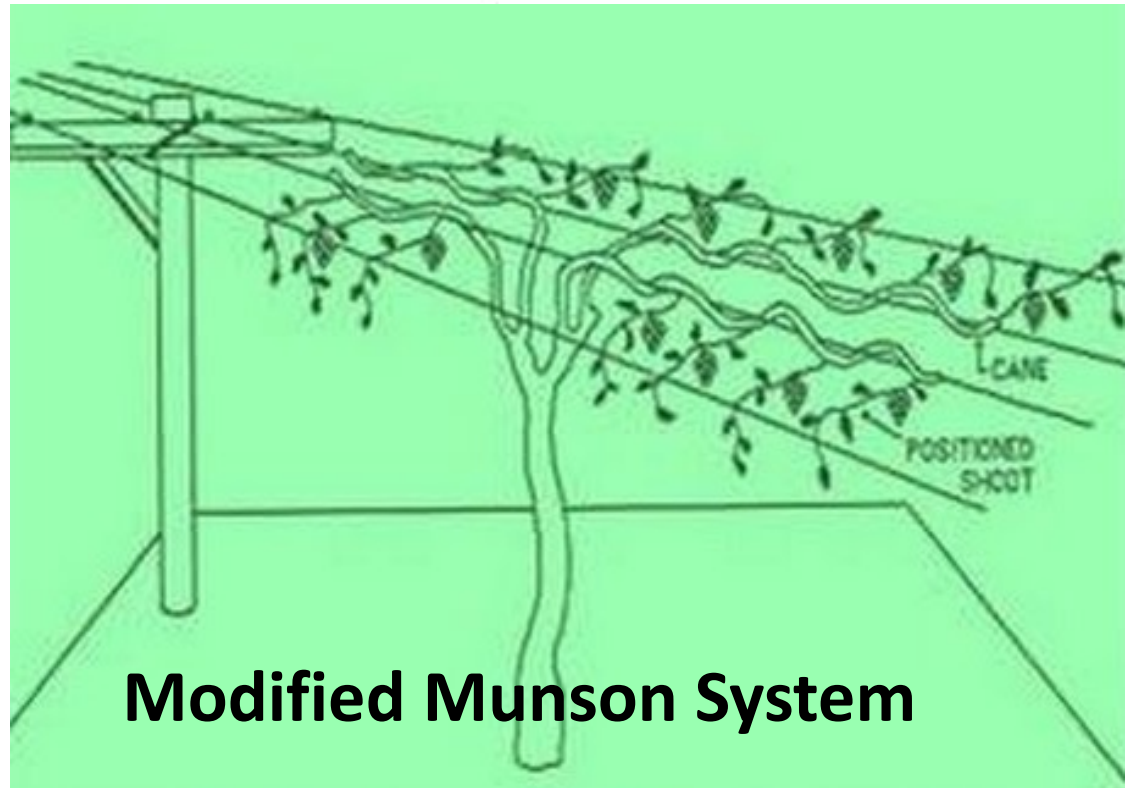
## Table Grapes

- grown in a way to minimize clusters from touching other clusters, stems or leaves.
- A trellis system that lets the grapes hang independently is better for producing ideal table grapes.

# Training Systems for Table Grapes



- Uniform exposure to sunlight, air circulation, spray penetration
- Clusters do not rub against vine or trellis
- Ease of management



# Table Grape Varieties

## Seeded

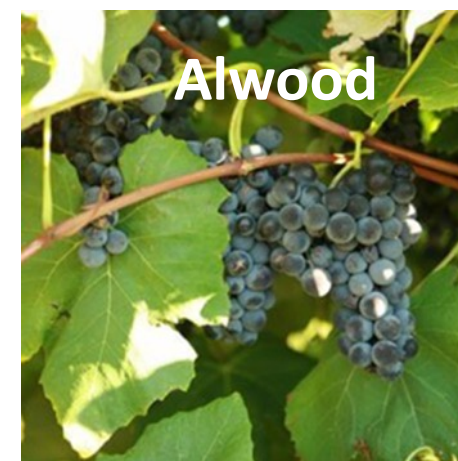
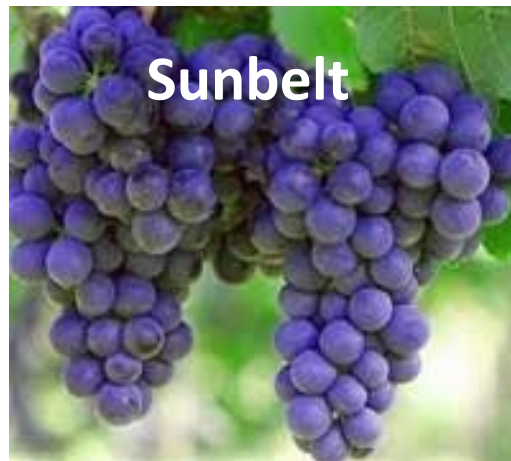
- Concord and Sunbelt (B)
- Buffalo (B)
- Catawba (R)
- Delaware (R)
- Fredonia B)
- Golden Muscat (W)
- Niagara (W)

## Seedless

- Concord Seedless (B)
- Marquis (W)
- Venus (B)
- Reliance (P)
- Mars (B)
- Saturn (R)
- Faith (B)
- Hope (G)
- Gratitude (W)
- Joy (B)

# American Bunch Grapes: Concord types

- **Alwood:** similar to Concord, larger berries, productive, above average disease resistance
- **Concord:** blue fruit, vigorous vines, productive, medium-size clusters, uneven ripening in clusters
- **Fredonia:** early Concord-type, ripens ~ 2 weeks earlier, table & wine
- **Sunbelt:** Concord-type, productive, more uniform ripening in clusters, recommended as a replacement for Concord



# American Bunch

- **Catawba:** purple-red fruit, med. Large clusters, spicy flavored, widely used for sparkling wines
- **Cayuga White:** American hybrid, very productive, light green fruit, good disease resistance
- **Cynthiana (Norton):** small to medium clusters having small to medium grapes, fair disease resistance, high acidity in fruit, red wine



# American Bunch

**Niagara:** light green fruit, attractive, productive, vigorous vines, foxy flavor, large slipskin berries

**Noiret:** American hybrid Steuben X Chancellor, red wine

**Steuben:** medium to large clusters, medium size berries, spicy flavor





# Muscadine Grapes

- Carlos: bronze, self-fertile, vigorous, high yields, medium size fruit, cold hardy, disease resistant
- Doreen: self-fertile, bronze, vigorous vines, productive
- Magnolia: bronze fruit, self-fertile, high yields, good sugar level, wet picking scar, relatively cold tolerant



# Muscadine Grapes

- Nesbitt: black, self-fertile, mid to late season ripening
- Tara: bronze fruit, self-fertile, early ripening, dry stem scar, good fruit rot resistance, high yields



# Muscadine Grapes

- Noble: black fruit, self-fertile, high yields, good sugar levels in fruit, disease resistant
- Scuppernong: bronze fruit, female flowers, cold hardy, midseason ripening



# Seedless Grapes

- **Marquis:** from Cornell, greenish-white fruit, productive, large clusters with large spherical berries, melting texture, slipskin, excellent flavor
- **Vanessa:** from Minnesota, red fruit, medium size clusters, firm flesh



# Seedless Grapes

- Joy: Univ. of AR, blue fruit, non-slipskin, thin skin, fruity flavor
- Jupiter: Univ. of AR, large clusters of large, reddish-brown berries with a mild muscat flavor, non-slipskin, crisp flesh texture
- Neptune: Univ. of AR, large, attractive conical clusters with yellow-green non-slipskin berries having a moderately thick skin



# Seedless Grapes

- **Faith:** Univ. of AR, blue fruit, non-slipskin, early maturing
- **Gratitude:** Univ. of AR, green berries, non-slipskin, thin skin, flavor neutral (similar to most *V. vinifera* varieties)
- **Hope:** Univ. of AR, green fruit, fruit flavor, high yields, non-slipskin, moderate vigor



# Do grapes last longer if stored on the stem?

Short answer: Yes. Grapes spoil faster once they're plucked off the stem. This is because removing the stem leaves a hole in the grape's skin. Here's how to make sure your grapes are fresh:

Step 1: Only remove them from the stem once you're ready to eat them.

Step 2: Make sure the stems are still firm, not mushy.

Step 3: Purchase grapes when they are in season, which is **during the fall**.

The fresher you buy them, the longer they'll last.

- **Store grape boxes immediately:**

- 30 – 32 F with 90 – 95 percent relative humidity.
- Do not store grapes near a cooling unit's direct air path to avoid accelerated dehydration.
  - good air circulation is one of the best ways to keep grapes in optimum condition
    - When buying in volume, gently stack grape boxes in the cooler so that air can circulate around them rather than directly on them.
- Like most berries, grapes tend to absorb odors. Try to avoid storing them next to green onions and leeks.
- Never store or display grapes where they will come in direct contact with water, ice or iced products, as the moisture will decrease their shelf life.



# The best ways to store your grapes:

- Place them, unwashed, into an airtight container and put them in your refrigerator.
  - can last for just over a week
- Storing your grapes in the back of the fridge, where the air is colder, can go a long way to help.
- Best way to store them, though, is to freeze them
  - can last much longer this way and are still quite versatile
  - make excellent ice cubes for a fun, fruity cool down
  - can also be added to fruit salads or eaten as snacks.
  - Freezing and thawing fruit can change its texture, so it's best to use them while they're still frozen.



# Compassion



- Newest seedless grape in the series of table grapes from Arkansas.
- Attractive green berry with a notably firm, crisp texture.
- Exquisite fruity flavor includes some aspects of muscat.
- Non-slipskin, typically without traces of seeds.
- Vines are moderate in vigor with consistent production and overall vine adaptation.
- \*Propagation of this variety is prohibited by law\*

# Faith



- Blue, non-slipskin, seedless grape
- Ripens early, late July to early August in Arkansas.
- Largely neutral flavor with slight fruity flavor in some observations.
- Berries average 4 g, and cluster weight ranges from 150 to 250 g, medium in size.
- Soluble solids content averages 19% and skin is edible. Fruit cracking was usually not found after summer rainfall during ripening or at maturity.
- Vines usually have moderate vigor and yield and exhibit good cold hardiness in Arkansas.
- Should complement 'Jupiter' for the early local market for table grapes.
- Negative aspects include:
  - uneven set of berries in some years resulting in reduced cluster fill,
  - occasional seed traces that can harden in some years
  - slight skin astringency noted occasionally.

# Gratitude



- Exceptional crisp texture
- Seedless, green (white) berries.
- Berry weight averages 3.5 g and clusters can weigh up to 500 g.
- Harvest is usually late August in central Arkansas
- Moderate yields.
- Skin is very thin
- No seed traces were found most years.
- Soluble solids content averages 19%.
- Flavor is neutral, similar to *Vitis vinifera* table grapes.
- Fruit cracking was not observed, an exceptional characteristic for a crisp, thin-skinned variety grown in an area with rainfall near maturity and harvest.
- Clusters are usually very tight.
- Negative characteristics include:
  - occasional winter injury to vines
  - tight cluster fill.

# Hope



- White (green) seedless non-slipskin grape
- Fruity flavor
- High yields. Berries average 3 g.
- Seed traces are seldom seen.
- Soluble solids content averages 19%
- Texture is soft.
- Only slight fruit cracking was seen following rainfall.
- Harvest usually August 20th in central Arkansas.
- Clusters are usually very tight and range from 300 to 330 g.
- Yields were usually 35 to 50 lb/vine.
- Vines are moderate in vigor.
- Negative observations:
  - excessively tight clusters
  - moderately thick skin.

# Joy



- Blue, non-skinskin, seedless grape
- Exceptional fruity flavor.
- Skin is very thin
- Fruit cracking during rainy periods near or at harvest has rarely been seen.
- Berry weight averages 3 g
- Clusters weight is usually near 300 g.
- Average harvest date August 11th in Arkansas.
- Vine yield moderate to high
- Vines have moderate vigor along with consistently good vine health.
- Shortcomings include:
  - a very soft texture,
  - occasional variable berry set resulting in some “shot” berries
  - shatter of ripe berries at maturity noted in some years
  - Occasional hard seed traces

# Jupiter



- Reddish-blue colored, non-slipskin seedless grape
- Mild Muscat flavor. It is a non-slipskin
- Crisp flesh texture.
- Skins relatively thin
- Fruit cracking is not common.
- Relatively large individual berries& clusters
- Yields may run as high as 10+ tons per acre
- May occasionally produce a noticeable, soft seed trace.
- Vine is moderately vigorous
- Has moderate resistance to common fungal diseases.
- One of the hardier Arkansas cultivars.



# Mars



- Reddish-blue colored, slipskin seedless grape with a foxy flavor (a flavor often associated with *Vitis labrusca* grapes).
- Berries are medium in size.
- Skins are thick
- Fruit cracking is seldom a problem.
- Yields can be 10 or more tons per acre.
- Extremely cold hardy V
- Very vigorous growth habit.
- Most disease resistant of the Arkansas cultivars.

# Neptune



- Seedless, non-slip-skin white grape
- Has a fruity flavor, but is not foxy.
- Clusters fairly large and loose enough to deter much bunch rot.
- Berry size is medium
- Yields are moderate, in the 5 tons per acre range.
- Moderate cold hardiness is for a table grape.
- Vine vigor medium to low vigor
- Fruit is resistant to cracking, which can be a problem on other cultivars in years where rainfall during harvest is present.

# Reliance



- Red, seedless cultivar
- Very cold hardy in the northern United States
- Very good, fruity flavor
- Fruit color may vary from year to year
- Very susceptible to fruit cracking near harvest because of its thin skin
- Berries are small to medium in size with medium to large clusters.
- Seed traces are almost never found
- Yields moderate
- Vine vigor is moderate and it has moderate resistance to common fungal diseases.

# Saturn



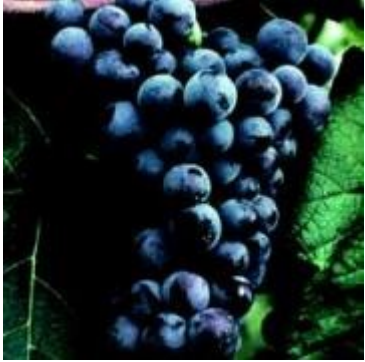
- Red, seedless, non-slipskin cultivar
- Strong fruity flavor
- Crisp flesh
- Stores well
- Has some issues with cold hardiness and disease susceptibility that limit its commercial viability
- Berry size medium with medium to large clusters.
- Yields low to moderate (around 4 tons per acre)

# Venus



- Mostly seedless, slip-skin, dark-colored grape
  - has a foxy, Muscat flavor
  - attractive clusters
  - reliable producer
  - Berries medium in size
  - Clusters are medium to large in size and tightly packed
  - Berries often have a noticeable seed trace.
  - Yields can be high, up to 10 tons per acre for ‘Venus’.
  - Vine is moderately cold hardy and has a moderate vigor
  - Has some resistance to common fungal diseases.

# Sunbelt



- Parentage of 'Sunbelt' is Concord O.P. (open pollinated).
- Often referred to as the "Southern Concord"
- Blue juice grape that is very similar to 'Concord'
  - displays even ripening under hot conditions.
  - Taste and growth habit are very similar to 'Concord'.
  - Berries are seeded and large.
  - Clusters tend to be small. Yields low to moderate (4 to 5 tons per acre)
  - Vine displays good cold hardiness and moderate vigor
  - Moderate to high resistance to common fungal diseases

# Marquis



- Mid-season, white, slipskin seedless
- Developed at Cornell University, patented in 1999
- Large fruits, large clusters
- excellent flavor
- good winter hardiness
- primarily grown for use as a table grape, but is also known to produce a delicate white wine.
- Woody, deciduous, upright to slightly trailing vine
- Blooms mid-season
- Ripens late mid-season
- Ripe fruit is characterized as having a very mild labrusca character, later ripening into a richer fruity American flavor.

# Vanessa



- Developed by the Horticultural Research Institute of Ontario in 1965
- Vines are vigorous & moderately productive
- Medium-sized clusters
- Fruit deep red berries with moderate bloom,
- Firm flesh
- Crisp texture
- Flavor is mildly aromatic but not of Labrusca type
- Considered among the best of red seedless grapes.



# Canadice



- Canadice produces compact clusters with medium size, pink to light red seedless berries. A slipskin variety with tender and edible skin with a distinct but not overpoweringly labrusca flavor

# Concord Seedless



- A sport of Concord
- Clusters and berries smaller than Concord.
- Fruit matures earlier than Concord
- Good flavor  
Perfect for pies and preserves.

# Einsett Seedless



- Einset Seedless produces medium-sized clusters with oval, bright red berries with a light waxy bloom. Tender to firm flesh with Labrusca and strawberry character, medium-sized soft seed remnant is not usually noticeable.

# Glenora



- Glenora is a high quality seedless variety that produces medium-sized blue berries with mild and pleasant flavor

