

USU Grape Growing Resources

Grape Trellising and Training Basics
Filmed: May/June, River Block and Mike Pace

Grape Vine Management
Filmed: May/June, Mike Pace, and River Block

PRUNING & TRAINING GRAPES

Grape Varieties for Utah
Filmed: May/June, Mike Pace, and River Block

Utah State University Extension YouTube Channel

General Information

- Deep rooted (2' - 5')
- Relatively tolerant of saline soils
- Woody vine can live for many years
- Need strong, permanent support
- Low fertilizer input
 - 0.7 ounces of N/plant/year (30 pounds n/acre)
 - May need chelated iron

Grapes: Types

Vitis vinifera

- European wine and table grape
- Characteristics
 - Semi-Hardy
 - Non-slip skin (clingskin)
- Popular varieties
 - 'Thompson Seedless'
 - 'Black Corinth'
 - 'Zinfandel'
 - 'Tokay'
 - 'Chardonnay'
 - 'Reisling'

Thompson Seedless grape. Picture by Julie Knittel

Grapes: Types

Vitis labrusca

- American bunch grape
- Characteristics
 - Hardy
 - Slip skin
- Popular varieties
 - 'Concord'
 - 'Delaware'
 - 'Himrod'
 - 'Niagara'

Concord grape. Picture by Julie Knittel

Grapes: Types

French/American Hybrids

- *V. vinifera* x American species
- Characteristics
 - Hardy
 - Insect/disease resistant
 - Some are slip skin
- Popular varieties
 - Reliance
 - Jupiter
 - Vanessa
 - Valiant
 - Canadice

'Jupiter'

Hardy (Hybrid) Wine Grapes

- AKA non-vinifera wines
 - Some have some vinifera genetics
- Black sheep of wine
- Crossings of different grape species
 - *V. labrusca*, *V. riparia*, *V. rupestris*, *V. aestivalis*
- Used for their hardiness and phylloxera resistance
- Can make good wines
 - marketing



Frontenac grape. Picture by Julie Knittel

Hardy (Hybrid) Wine Grapes

- Examples:
 - Marquette – 2006 Minnesota
 - Frontenac – 1996 Minnesota
 - La Crosse – 1983 Swenson
 - Brianna – 1983 Swenson
 - Aromella – 2014 Cornell
 - Enchantment – 2016 Arkansas
 - Opportunity – 2016 Arkansas
- Breeding programs
 - University of Minnesota
 - Cornell University
 - University of Arkansas
 - Elmer Swenson (Wisconsin)

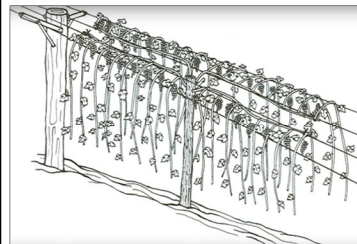


LaCrosse grape. Picture by Julie Knittel

Training Systems

- Most cold-hardy table grapes are best on a Munson or Modified Munson training system
- Most cold-hardy wine and juice grapes are best on a Top-Wire Cordon training system

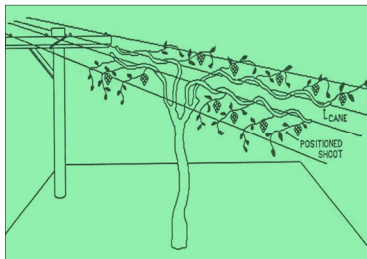
Modified Munson



Thomas Zabaddel, MSU

- Good for hand-harvested table grapes in temperate climates.
- Good light exposure
- Easy to spray
- Good cluster access for harvesting
- Must use long-cane pruning and not cordons/spurs to have this work for fresh fruit.
- High cost and effort to build a 3-dimensional trellis.
- Shoot positioning and tying is mandatory
- Can build adjustable outer wires that are positioned later in the season after the shoots are long enough to reach it.

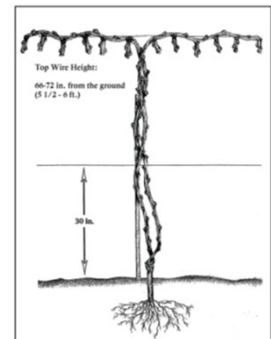
Modified Munson



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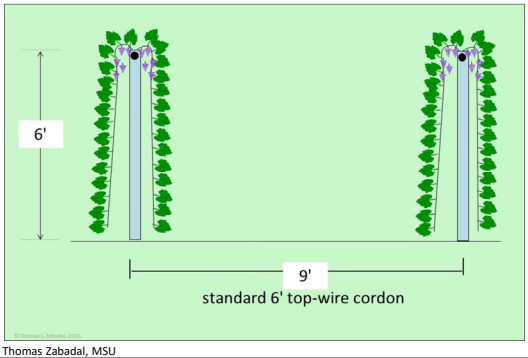
Top-Wire Cordon

- Popular for hybrid wine grapes and American juice grapes in cool climates
 - Procumbent cultivars
- Fruit and renewal zone at the top for max. maturity
- Typically used with short-cane (long spurs) pruning.
- Highly mechanizable.
- Not suitable for vineyards with frequent severe winter injury
 - takes a long time to reestablish the cordon.
- Strong trellis to keep the wire from sagging over time.
- Potential for over cropping since the renewal zone is at the top and it can become very fruitful,
 - Incomplete ripening



www.Doublevineyards.com

Top-Wire Cordon



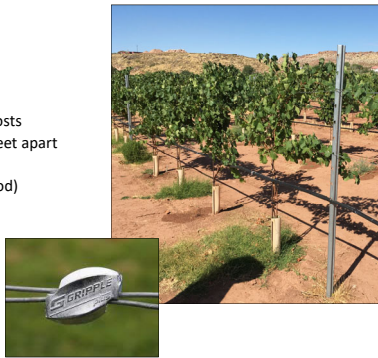
Trellis

- End posts 6"+ dia.
- 2-3 feet deep
- Ground anchors or bracing
- Line posts
- Crossarms?



Trellis

- Line posts
 - Set in rows between end posts
 - Every 3 plants or up to 21 feet apart
 - 2' deep
 - At least 3" in diameter (wood)
- Wire
 - High-tensile
 - 12.5 gauge or heavier
 - Tensioning system



Spacing

- Based on training style and plant vigor
- GENERALLY
 - Table, juice grapes
 - 8 foot in-row plant spacing
 - 8-9 feet between rows
 - Wine grapes
 - 3-6 feet in-row plant spacing
 - 8-9 feet between rows



Irrigation

- Grapes do well with drip
- Pipe hung on low wire
- Pre-installed emitters
- User-installed emitters
- Irrigated 2x/week for 90 minutes
 - Clay loam soil
 - More often, less time for sandy soil



Grape Cultivar Trial

- Replicated cultivar started in 2014
- Cold hardiness and harvest potential
- ½ acre planting in 4 parts
- Investigate many new hybrid table and wine grapes
- 21 cultivars presently in the trial



Grape Trial Results



Cultivar	# Planted	# Surviving Plants	Percent Survival
Alden	12	9	75
Aromella	9	8	89
Beta	14	14	100
Bluebell	15	12	80
Canadice	15	14	93
Concord	12	12	100
Delaware	14	7	50
Edelweiss	13	8	62
Frontenac	12	10	83
Himrod	13	12	92
Jupiter	14	14	100
La Crosse	10	10	100
Marquette	8	4	50
Marquis	16	16	100
Niagara	18	18	100
Reliance	15	14	93
Swenson Red	14	9	64
Thompson Seedless	11	8	73
Valiant	14	14	100

Grape Trial Results

Grape harvest data and characteristics summary. Harvest dates can be plus or minus up to 2 weeks from the average date due to seasonal variations.

Cultivar	Avg. Harvest Date	Crop load range (lbs./plant)			Estimated yields (lbs./acre) ¹	Fruit size (grams/berry)	Sugar content (%Brix)
		High	Low	Avg.			
Alden	Aug. 29	13.1	8.6	10.9	7,400	4.1	17.1
Aromella	Sept. 9	24.0	8.6	15.9	10,800	0.8	21.7
Beta	Sept. 1	13.6	12.6	13.1	8,900	1.2	25.2
Bluebell	Aug. 30	11.3	12	11.7	8,000	3.0	21.1
Canadice	Sept. 1	11.0	12.5	11.7	8,000	1.6	25.9
Concord	Sept. 22	16.2	10	12.9	8,800	2.9	22.5
Delaware	Sept. 6	9.3	12.3	10.8	7,400	1.0	24.7
Edelweiss	Sept. 1	8.9	7.4	8.1	5,500	1.9	19.2
Frontenac	Sept. 3	17.2	15.3	16.2	11,000	0.8	26.9
Himrod	Aug. 22	32.3	19.1	23.8	16,200	2.4	22.9
Jupiter	Sept. 9	25.3	15.3	21.0	14,300	3.8	23.3
La Crosse	Sept. 1	8.2	16	12.7	8,600	1.2	23.6
Marquette	Sept. 5	15.0	15.0	15.0	10,200	-	27.6
Marquis	Sept. 6	38.3	18.9	31.1	21,200	3.7	19.1
Niagara	Sept. 6	14.1	8.4	12.5	8,500	1.2	17.7
Reliance	Sept. 1	15.0	12.0	13.3	9,100	2.0	21.8
Swenson Red	Sept. 1	12.6	10	11.5	7,800	1.8	23.6
Thompson Seedless	Sept. 6	14.1	8.4	12.2	8,300	1.4	23.4
Valiant	Sept. 1	24.3	13.5	19.3	13,100	1.2	23.3

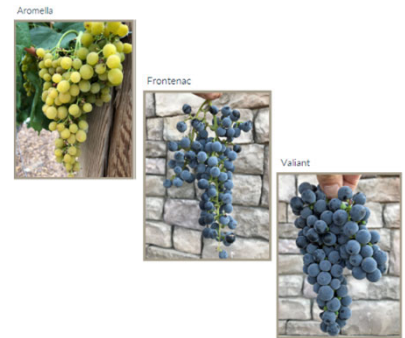
Top Producers

- Seedless Cultivars
 - Marquis – 31 lbs.
 - Himrod – 24 lbs.
 - Jupiter – 21 lbs.
- Marquis and Himrod would be good replacements for Thompson Seedless as they are hardier and more productive
- Jupiter has a long harvest window (about 3 weeks)



Top producers

- Seeded Cultivars
 - Aromella – 16 lbs.
 - Frontenac – 16 lbs.
 - Valiant – 19 lbs.



Didn't do so well

- Alden, Beta, Bluebell
 - Most problems with iron chlorosis
 - Bluebell was the worst
 - But had pretty good survival
- Swenson red
 - Five plants rapidly died during growing 2019 growing season
- Marquette, Delaware, and Edelweiss
 - Poor establishment and survival
 - 50%, 50%, and 62% respectively



Lowest Yields

- Alden – noted to be a vigorous plant
- Delaware – low vigor plant
- Edelweiss – noted to be a vigorous plant
- Swenson Red – noted to be a vigorous plant
- Not necessarily a problem, but they were for us
 - Increase/decrease vigor
 - Increase plant density?
 - Grow in better soil



Delaware grape cluster

General Annual Tasks

- Pruning
- Fertilizing
- Cane tying
- Cluster thinning and pruning (for table grapes)
- De-leafing around the clusters
- Harvesting
 - Similar to apples and pears
 - Mid August through September
- Pests and Disease Management

Development Costs

- Commercial wine grape growers
 - 30K/acre for trellis, plants, planting, drip irrigation system
- Half-Production in years 3-4
- Full production in years 5-6
 - If vigor is good
- Establishment costs vary a lot
 - Deer fencing
 - Plant density
 - Irrigation and ground prep requirements
 - Inflation

Development Costs

- \$5K for plants
- \$650 for end posts
- \$7K for line posts
- \$100 Wire hardware
- \$500 Wire
- \$2000 Drip pipe and emitters
- \$100 for Row Ball Valves
- \$5K Labor
- \$5K Ground Prep
- \$5K Deer fencing



Sales potential

- Have done limited testing at 2 farmers markets
 - Only tried selling seedless table grapes
 - About 20 pounds/crate
 - Grapes in crates
 - Were able to get about \$5 per pound



Pests and Diseases

- MAJOR PROBLEMS
 - Leafhopper
 - Birds
 - Herbicide Injury
 - Iron Deficiency
- MINOR PROBLEMS
 - Grape Leaf Skeletonizer
 - Powdery Mildew
 - Winter injury
 - Root rot

Leafhopper Injury



Bird Netting



- Birds are the most destructive pest we have
 - Deer are second
- We found bird netting most effective
 - Can be reused for several years

Herbicide Injury



Images by Essie Fallahi, University of Idaho

2,4-D injury

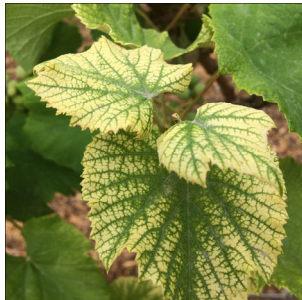


Image by Essie Fallahi, University of Idaho

Glyphosate injury

Iron Deficiency

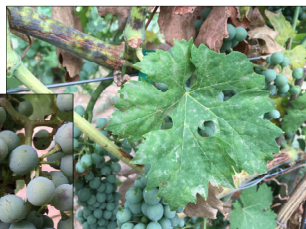
- Usually caused by
 - Compacted soil
 - Waterlogged soil
 - SOMETIMES by low iron in soil
- Herbicide injury can also make this worse



Grape Leaf Skeletonizer



Powdery Mildew



Winter Injury



Table grapes: thinning

- Remove all clusters in first 2 years
- Thin to two clusters per shoot
- Increases berry size, soluble solids, quality
- Just after fruit set
- Wine grapes are not thinned or shortened



Image by Essie Fallahi, University of Idaho

Shortening a cluster



Images by Essie Fallahi, University of Idaho

Why shorten a cluster?

Uncut cluster



Cluster that was cut and from a plant that was cluster-thinned



Images by Essie Fallahi, University of Idaho