

Organic Vineyard Establishment: Trellis and Planting Stock Considerations

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The primary differences between establishing an organic and a conventional vineyard are the requirements for non-treated wood posts for all trellising, including end posts, the need for organic planting stock, and the use of only organic-approved fertilizers and pesticides. This article provides an overview of planting stock considerations and trellis system supplies for establishing an organic vineyard. For questions regarding organic certification and regulations, contact your certifier. For a version of this handout that includes a sample worksheet of establishment costs, see our website <http://maritimefruit.wsu.edu/Grapes.html>.

Planting Stock

In certified organic production, organic perennial planting stock must be used unless it is documented to be commercially unavailable. Planting stock is considered organic when it has been grown for at least one full year under organic management. Grapes usually enter full harvest production in the third year after establishment. For organic growers who are certified by the Washington State Department of Agriculture (WSDA) Organic Food Program, refer to the *WSDA Seed, Annual Seedling and Planting Stock Guidelines* at http://agr.wa.gov/FoodAnimal/Organic/docs/3000_seed_planting_stock_factsht_8.09.pdf.

Grafted grape plants are recommended to protect against pests such as phylloxera, and selected rootstocks can provide earlier ripening in western Washington, which can be an advantage in a region where relatively low summer temperatures delay ripening. Grafted grape vines should be ordered two years prior to planting to allow plenty of time for the propagator to graft and establish the plants. Green-grafted plants are generally ordered one year prior to vineyard establishment and are less expensive to purchase, but may exhibit lower graft survival.

Trellis Systems

Most growers find it easier to plant new vines before installing the trellis system. Field work is easier before the wires and posts are in place, and support stakes can be driven closer to vines. The US National Organic Program (NOP) standards prohibit the use of wood treated with arsenate or other prohibited materials (e.g. creosote) for new installations or replacement purposes. Treated wood in existing trellis systems that are certified to National Organic Standards (N.O.S) is allowed, but replacement wood must not be treated.

End posts. End posts provide the main support for the trellis wire, and are the most costly component of an organic vineyard trellis system due to the strength and size needed to construct a long-lasting trellis system. End posts should be at least six inches in diameter, set three feet deep or more, and be well braced to resist shifting caused by stresses on the trellis system. The bracing methods and the depth to which posts are set will vary somewhat depending on the soil character and land contour. See “Constructing a Vineyard Trellis” below in the References, which contains diagrams of typical systems. In the WSU Mount Vernon NWREC organic grape block, end posts are nine feet long and sunk three feet into the ground at an angle of 30° from

vertical. The brace wire is perpendicular to the ground and held by earth anchors 36 inches long with a six inch helix.

End posts can be made from a number of trees that produce durable wood even when untreated. Oregon State University, Corvallis compared the durability of various types of posts in a long-term study comparing untreated posts from a number of tree varieties, including western juniper, black locust, osage orange, redwood, Pacific yew, Oregon white oak, and several species of cedar, fir, pine, and hemlock. The results of this study can be seen at *Service Life of Treated and Untreated Fence Posts* (1999; Morrell, Miller, and Schneider) http://juniper.oregonstate.edu/bibliography/documents/phpKKcnVf_post-farm.pdf.



Figure 1. Drilling postholes for end posts

We selected **juniper** for the end posts at the WSU Mount Vernon NWREC organic grape block (Figure 1) because it is available in the PNW area, and is highly durable with natural resistance to decay (reported to last 30+ years in tests, longer than any other untreated western species). In addition, it shrinks and swells less than many other PNW species, and has unique bending properties.

Trellis posts: There are several types of metal posts used in vineyards, and all those

described here are allowed in organic vineyards.

The *Mannwerks* post (Figure 2) features cold-formed hot rolled steel with minimum tensile strength of 65,000 psi, and a minimum yield point of 50,000 psi. These posts are designed to be gentle on mechanical harvesters, extremely stable in soil, and user friendly.

Rib back posts (Figure 3) are 9 feet long and consist of three pounds of steel per foot. The 3/8 inch diameter holes run the entire rib length of the stake every 2 inches. Commonly used as an end post option, rib back posts are ideally suited for rocky or hardpan soil conditions.

Diamond back posts (Figure 4) can be used as end posts since the diamond shape provides the strength needed for end posts, and the rounded edges are easy on mechanical harvesters.

Fencing T-posts (Figure 5) can be used in vineyards for trellising, but are not as popular as some other types. Although inexpensive and available in various lengths, they require installation of wire clips to support the wires, which is an additional expense and effort.

Rolled Edge Vertical Line posts (Figure 6) were used as in-row support posts at the WSU Mount Vernon NWREC organic grape block. The standard post is eight feet long, 13 gauge, and self-colored. for a natural 'wood' look in the vineyard, and avoids any concern with wood preservatives. Heavier duty 12 gauge posts are available for areas of high wind conditions, or trellis systems that will carry an extra heavy load. Side notches make wire placement easy, and require no clips for installation, reducing expense and labor. These posts are well suited for mechanical harvesters.



Figure 2.

Figure 3.

Figure 4.

Figure 5.

Figure 6.

Support stakes: Support stakes are needed for each vine during the establishment years, and are placed in the vineyard when vines are planted. Bamboo stakes are often used for the first two years or until vines reach the fruiting wire, after which they can be removed. Steel support stakes are long-lasting and have attachment points for easy wire installation.

EARTH ANCHORS

Anchors used to brace the end posts should be of high quality steel with a center or offset eye and helix plate. Angle and depth of setting depends on the method of bracing and on soil type. Install anchors in line with the wire, so the offset eye is just above the ground. Install anchors by hand using a rod, crow bar, or length of pipe. If the ground is very hard, dig a hole to a depth about ½ the length of the anchor, then turn the rest of the way by hand. Earth anchor adaptors can be used on post hole augers for mechanical installation (Figures 7 and 8).



Figure 7. Setting post anchors



Figure 8. Drilling in post anchors

WIRE

For trellis construction, use 9 – 12 gauge, tempered, high-tensile wire adapted to vineyard uses; it resists rust and stretching better than galvanized wire. Standard vineyard trellis systems include

one low irrigation wire (about 15 inches above ground level), one fruiting wire (28 inches above ground level), and two to three pairs of catch wires (each spaced from 1 to 2 feet apart).

Fasteners: Two commonly used types of wire fasteners are the *crimping sleeve* and the *gripper*. Inexpensive crimping sleeves are effective for splicing wires, requiring only a crimping tool, and in-row spool type wire tighteners to adjust wire tension. A gripper splices smooth wire up to six times faster than traditional methods for joining smooth wire. Inside the gripper, each wire moves in only one direction, passing over high precision gear-tooth rollers. The moment any load is applied in the opposite direction, the rollers bite, locking the wire. Recommended for in-line splices, loop anchoring and repairs on trellis lines up to 500 ft. long, this system requires a gripper tensioning tool to pull the wire effectively through the fastener to the required tension.



Figure 9. Organic wine grape vineyard at WSU Mount Vernon NWREC, August 2009.

RESOURCES

Constructing a Vineyard Trellis. Presentation, Iowa Grape Growers Conference, January 26, 2002. <http://viticulture.hort.iastate.edu/info/pdf/domototrellis.pdf>

WSDA Organic Food Program, organic@agr.wa.gov, 360-902-1805.

WSU Vineweb: Organic Viticulture Resources

<http://winegrapes.wsu.edu/organic.html>

WSU Mount Vernon NWREC Organic Grape Vineyard Trial

<http://maritimefruit.wsu.edu/Grapes.html>

SAMPLE WORKSHEET

Cost¹ for establishing 3 acre Organic Wine Grape vineyard @ WSU Mount Vernon NWREC			
ITEM	SUPPLIER	QUANTITY	COST
Fertilizer			
Gypsum (pelletized)	Wilbur Ellis Company	2400 pounds	\$755.67
Fishbone Meal	Wilbur Ellis Company	450 pounds	\$287.27
Wood posts – Juniper, 9’	Linde Vineyard Supply	150	\$1,567.50
Earth anchors for end posts	Linde Vineyard Supply	150	\$660.00
Rolled edge steel vertical line post	Linde Vineyard Supply	440	\$2,131.20
Gripple fasteners & tool	Linde Vineyard Supply	1 tool + fasteners	\$599.25
Trellis wire, 12.5 gauge	Wilson Irrigation Supply	3900 ft.	\$1,011.15
Bamboo plant stakes	Wilson Irrigation Supply	2500	\$488.65
Clips for bamboo stakes to wire	Wilson Irrigation Supply	2500	\$172.20
Wax milk cartons (plant protectors)	Wilson Irrigation Supply	1/2 gallon size - 2100	\$115.50
PVC pipe - mainline	Ferguson Irrigation & Waterworks	680 feet	\$439.09
Fittings/connectors/valves, as needed	Ferguson Irrigation & Waterworks	various	\$531.44
Fertilizer injector + suction line	Larson Irrigation, Inc.	1 Mazzei injector	\$105.33
Drip tube ² , fittings, connectors	Larson Irrigation, Inc.	13,000 ft.	\$1,102.53
Pressure reducing valve	Larson Irrigation, Inc.	1 valve	\$200.00
Backflow device	WSU MV NWREC	1 backflow preventer	\$300.00
Equipment rental (trencher)	Birch Equipment Rental	1 day @ \$250 per day	\$270.50
Custom post digging (end posts)	Lil Scoop Bobcat	4 hrs @ \$175/hr	\$700.00
Cover crop, seed @ 300 lbs/A	Pleasant Valley Farm Supply		\$502.03
Grape plants - green grafted ³	Cloud Mountain Farms	1,890	\$6,519.17
Total Cost of Vineyard Supplies			\$18,458.48

¹Prices as of spring 2009

² Drip tube: 18 mm, 0.55 gph, 24 inch spacing

³Cultivars ‘Pinot Noir Precoce’ (1,050) and ‘Madeleine Angevine (840) grafted on Couderc 3309