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Daniel Cooley

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Sonia Schloemann

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Development of a Research and Education Program for Small-scale, Sustainable Viticulture and Enology in Massachusetts

Daniel Cooley, William Coli, Sonia Schloemann, Justine Vanden Heuvel, Duane Greene, Wesley Autio, Jon Clements, Ann Averill, Craig Hollingsworth, Frank Caruso, Hilary Sandler, and Jochen Weiss

Department of Plant, Soil, & Insect Sciences, Department of Food Science, and UMass Cranberry Experiment Station, University of Massachusetts

Over the past two decades, enterprising growers have begun to produce high-quality wines in Massachusetts and other parts of southern New England. These growers have shown that small-scale wine production can thrive in the state, thanks to an understanding that Massachusetts is not climatically different from many established grape regions in the world, an improvement in cultivars, and an increasing demand for both wine and locally produced crops.

Grapes offer agriculture in Massachusetts a high-value crop with unique, local appeal. Existing vineyards primarily sit along the Commonwealth's southeast coast, but grape production could be extended inland to include the Connecticut River Valley. Expanding grape production could provide more stand-alone vineyards, or provide another crop for diversified farms generating a number of opportunities. Diversifying crops spreads risk; if one crop fails, another can still succeed. Done properly, wine production attracts people to farms, giving wholesale businesses a means of entering direct marketing quickly. Teamed with beautiful scenery and other farm products, wineries can increase tourism in rural communities. Bringing people to farms and showing them the nature in agriculture can increase awareness of agriculture's contribution to the local environment and quality of life. In these ways, grapes benefit not only the farmers who grow them, but the community as a whole.

Getting started in viticulture is very expensive, and most growers are too close to the financial edge to risk such investment without assurance that they will succeed. They need to see that viticulture can work, and they need to be assured that they will have technical support and research to help them develop their businesses. Helping Massachusetts growers tap the potential of viticulture requires a three-pronged approach: developing an organizational infrastructure of growers and technical specialists to support wine production in Massachusetts; developing new approaches to growing wine grapes that will consistently produce high-quality wines; and developing expertise in small-scale enology.

Establishing Vineyard Research Blocks at the UMass Cold Spring Orchard

There are multiple objectives included in this project. Among them are the establishment of vineyard research blocks for the purpose of both showing growers the standard production methods for growing wine grapes (e.g., training, trellising, pruning, etc.) and for studying management practices tailored for production in our climate and soil conditions (e.g., cane girdling, cluster thinning, etc.).

Two blocks were planted in Spring 2005. Each consists of 12 rows, 160 feet long, spaced 10 feet apart, with vines spaced at 8 feet apart in the row. One block

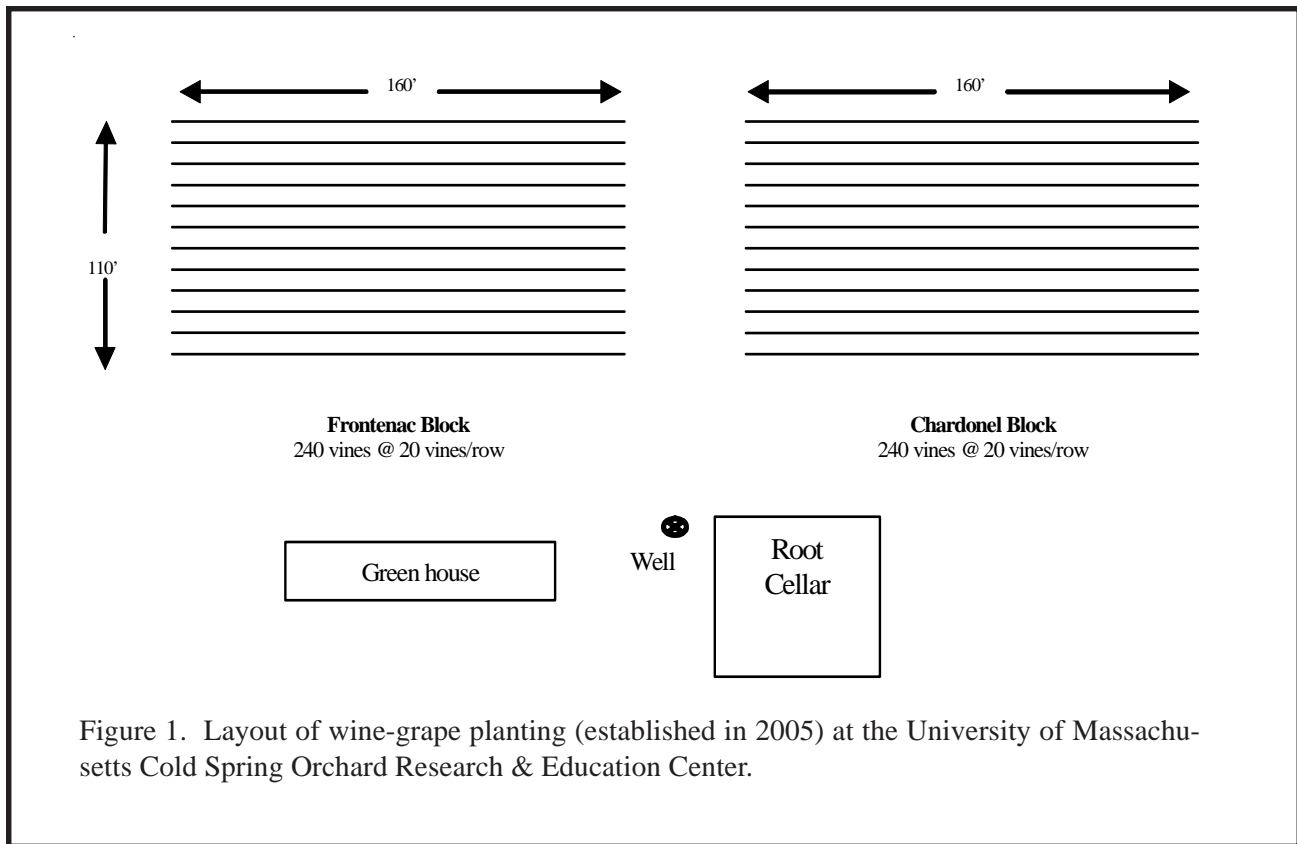


Figure 1. Layout of wine-grape planting (established in 2005) at the University of Massachusetts Cold Spring Orchard Research & Education Center.

is own-rooted (not grafted) Frontenac, vines purchased from Lincoln Peak Vineyard and Nursery in New Haven, VT (www.lincolnpeakvineyard.com). The other is Chardonnay grafted on 3309 root stock purchased from Double A Vineyards in Fredonia NY (www.doubleavineyards.com).

More vines of Frontenac are growing in MN than of any other variety, due to overall viticultural performance and excellent wine quality. Frontenac is a very cold-hardy vine and has borne a full crop after temperatures as low as -30°F . The small, black berries are produced on medium to large clusters that are usually slightly loose. As a result, berry splitting and bunch rot have been rare, even in wet years. Frontenac has been a consistently heavy producer and sometimes requires cluster thinning. Frontenac is vigorous and usually becomes established quickly. Typical spacing on fertile soils would be about 8 feet between vines. Best results to date have been obtained from training Frontenac to an upper cordon system with canes. Frontenac produces only a moderate number of tendrils,

which facilitates vine management. Frontenac ripens in late midseason, and it is important to let the fruit hang long enough to fully mature, to reduce the acidity to workable levels. This is less of a problem when Frontenac is grown under warmer conditions. Fortunately, the pH does not often rise to dangerous levels. Frontenac is a good sugar producer with 24-25 $^{\circ}\text{Brix}$ not uncommon. Frontenac wine typically has a pleasant cherry aroma with berry and plum evident in many cases. The herbaceousness of its wild riparia background is almost entirely absent. The color is usually a garnet red, but can become excessively dark with long periods of skin time. Malolactic fermentation is essential to reduce the wine's high acidity. Tannin levels are usually relatively low. Frontenac is very disease-resistant, with good resistance to powdery mildew and near-immunity to downy.

Chardonnay is a late ripening white wine grape which can produce a high quality wine with varietal character. Chardonnay is distinguished by its superior wine quality combined with high productivity and cold

hardiness superior to its acclaimed parent, Chardonnay. It is the fourth wine grape cultivar to be named by the New York State Agricultural Experiment Station and follows the release of Cayuga White (Einset and Robinson, 1972), Horizon (Reisch et al., 1983), and Melody (Reisch et al., 1986). Chardonel resulted from the cross, Seyval x Chardonnay, made in 1953. Fruit were first observed in 1958 and the original vine was propagated in 1960 under the number NY-45010. In later testing it was re-named GW-9 (Geneva White 9) for ease of identification in cooperatively run yield trials. The vine was initially described as a vigorous and productive green grape with large clusters. Chardonel vines are moderately winter hardy at Geneva but trunk injury is occasionally a problem. It is considerably hardier than Chardonnay and nearly as winter hardy as its Seyval parent. In Michigan, it is rated as hardier than Seyval and Vidal blanc. Trunks of Chardonel are susceptible to damage from low temperatures which may cause trunk splitting or provoke crown gall disease. Flowers of Chardonel are perfect and self-fertile with medium late bloom following late bud-break. Clusters are shouldered and medium-large (0.44 lbs.), averaging 1.6 clusters per shoot. Very little crop is borne on lateral shoots and cluster thinning is required only infrequently. The

amber berries are medium sized and spherical. Chardonel ripens between October 1 and 15 in New York and Michigan. Soluble solids concentration and titratable acidity of juice are usually higher than for Cayuga White. Wines, which were first made in 1966, have been described as pleasant and delicate with light fruitiness. In some years, the wine is slightly grassy. The wine has good body and very little of the flavor characteristics of interspecific hybrid grapes. Chardonel, when harvested at the appropriate stage, may have potential for sparkling wine production because it retains a good acid balance during ripening. At Geneva, wines have been rated good to excellent in taste panels. Foliage and fruit are moderately susceptible to powdery mildew (*Uncinula necator* [Schw.] Burr.), downy mildew (*Plasmopara viticola* [Berk. and Curt.] Berl. & de Toni), and botrytis bunch rot (*Botrytis cinerea* Pers.). Since the foliage is not susceptible to sulfur injury, powdery mildew can be controlled with sulfur applications.

Special Note

Please see this article on the UMass Fruit Advisor (<http://www.umass.edu/fruitadvisor/>) for color pictures of discussed varieties.



Frontenac

Origin: MN 89 x Landot 4511; U of M, 1996.

Uses: Red wine.



Chardonnay

Origin: 'Seyval' x 'Chardonnay'; NYSAES 1987

Uses: white wine

