Cold Climate Grape Varieties From Eastern U.S. Breeding Programs

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FPS has stepped up its efforts in recent years to acquire and add to the collection a variety of the most important cold-hardy grape varieties and make them available as disease-tested stock to our nursery, grower and winery customers for use in cold climate growing regions of the U.S.

Planning is in progress at FPS to move the most important cold-season varieties into its new Next Generation block, in which all source vines have been put through shoot tip tissue culture as presumptive treatment for crown gall, a disease of particular concern in cold-climate growing regions. Though only a portion of the selections planted in the Next Generation block to date have been tested for crown gall, the plan is to eventually screen all Next Generation selections for crown gall.

In addition to the traditional cold-hardy varieties that have long been available from the FPS collection, including Catawba, Chardonnay, Concord, Himrod, Isabella, New York Muscat, Niagara and Riesling, a newer group of interspecific hybrids are being developed by breeders at Cornell University and University of Minnesota especially suited to thrive in cold climate regions. Many of these varieties have been added to the FPS collection over the last few years. Included in this article are descriptions of two leading breeding programs in the Eastern U.S. with a focus on cold-climate breeding, along with information about their promising varieties, and references to information about other eastern U.S. research centers that focus on cold-climate viticulture.

CORNELL-GENEVA GRAPEVINE BREEDING AND GENETICS PROGRAM

Currently led by grape breeder and professor Bruce Reisch, the Cornell breeding program at the New York Agricultural Experiment Station in Geneva has used interspecific hybridization to select wine grapes with cold hardiness, high yield, disease resistance and high wine quality. Some of their earlier successful releases include ‘Cayuga White,’ ‘Melody,’ ‘Chardondel,’ ‘Marquis,’ and ‘Traminette,’ the latter three of which are patented and all of which are currently available as disease-tested Foundation stock from FPS. The characteristics of these five cultivars are described in greater detail in the 2004 FPS Grape Program Newsletter, October 2004, which can be viewed online at: http://fps.ucdavis.edu/WebsitePDFs/Newsletters&Publications/GrapeNewsletterOct2004.pdf, pp. 5 and 15.

The next group of Cornell varieties, developed and tested by Bruce Reisch and Cornell enology professor Thomas Henick-Kling and released in 2006, were ‘Noiret’™, ‘Corot noir’™ and ‘Valvin Muscat’™. This trio of Cornell-patented and trademarked varieties offered distinct improvements in the varietal options available to cold-climate grape growers. These three varieties are also available as disease-tested Foundation-status stock from FPS. Their release and detailed descriptions were profiled in the 2006 FPS Grape Program Newsletter, available online at http://fps.ucdavis.edu/WebsitePDFs/Newsletters&Publications/GrapeNewsletterNov2006.pdf, pp. 14-15.

Another Cornell red wine grape variety—GR7 (Geneva Red 7, released in 2003)—was submitted to the FPS program in 2006 for disease testing and inclusion in the FPS collection. Disease testing was successfully completed for GR7 in late 2007, and provisionally-registered source vines were planted in the FPS Foundation Vineyard in Spring 2008. Though not patented, GR7 is proprietary to Cornell University, and those requesting material must sign a Cornell “grape grower’s agreement”—nurseries must be licensed and collect royalties on sales.

A short description of GR7 (FPS 01) from the Cornell breeding program Website states “GR7 (Geneva Red 7)—A cross of ‘Buffalo’ x ‘Baco noir’, GR7 is a highly vigorous, highly productive and winter hardy grapevine, with moderate resistance to diseases. It makes dark red wines with a classical hybrid aroma, with better tannin structure than Baco noir and De Chaunac…It has a place in traditional red hybrid blended wines, and is already in limited commercial production.”

Information about all Cornell releases, as well as links to additional resources and information on cold-climate varieties and viticulture, is available at http://www.nysaes.cornell.edu/hort/faculty/reisch/grapeinfo.html#breed.
UNIVERSITY OF MINNESOTA COLD HARDY GRAPE BREEDING PROGRAM

The University of Minnesota initiated its breeding program for wine grapes in the mid-1980’s and, in 2000, completed a state-of-the-art enology lab and research winery. The goal of the program is to develop high quality, cold hardy, and disease resistant wine and table grape cultivars. In its ten acres of research vineyards with approximately 10,000 experimental vines, seedlings are produced each year using a diverse genetic base that includes classic Vitis vinifera cultivars, quality French hybrids, and cold hardy, disease-resistant selections based on Vitis riparia, Minnesota’s native grape. Over 1,000 vines are planted each year and subjected to high standards of evaluation. Currently over 100 advanced selections are being tested, as well as over 400 cultivars and selections from other breeding programs. In addition to cold hardiness and disease resistance, viticultural traits such as productivity, cluster size, growth habit, bud break, and ripening times are evaluated.

In the period from 1996 through 2006, the U of M breeding program developed and released four cold-hardy, productive, moderate- to highly-disease resistant wine grape varieties—Frontenac, Frontenac gris, La Crescent and Marquette—the latter three of which were submitted to the FPS program by U of M Horticulture Research Center scientist Peter Hemstad in March 2006.

The original material submitted to FPS successfully completed disease testing in late 2007. Provisionally-registered source vines of Frontenac gris, La Crescent and Marquette were planted in the FPS Foundation Vineyard in Spring 2008, and mist propagated plants (MPPs) can now be requested from FPS on a custom order basis. Because all three varieties are patented, FPS may supply material only to official licensees. To inquire about licensing, please contact James Rhodes at the University of Minnesota Technology Commercialization Office by email at rhode086@umn.edu or by phone at 612-624-0550. Grapevines may also be obtained from licensed nurseries, a list of which may be viewed online at http://www.grapes.umn.edu/nurseries.html.

The following descriptions of the three U of M-patented varieties included in the FPS collection are excerpted from the breeding program website at http://www.grapes.umn.edu, from which additional information about the varieties may also be obtained.

Frontenac gris (FPS 01) — According to the U of M website, this is a single-bud mutation of the University of Minnesota’s red wine cultivar ‘Frontenac’ that produces gray fruit and amber-colored juice. The authors describe Frontenac gris as reflecting the best characteristics of its parents, V. riparia 89 and the French hybrid Landot 4511. This vine has borne a full crop after temperatures as low as -33ºF, and is very disease resistant, with near-immunity to downy mildew. It is a consistently heavy producer, with small berries in medium to large clusters. Arching canes and minimal tendrils provide easy training and pruning to simplify vine management. In Minnesota, Frontenac gris ripens in late mid-season and is a good sugar producer with 24-25° Brix not uncommon.

Propagation of Frontenac gris has increased rapidly since its introduction in 2003. The U of M website describes Frontenac gris wines as presenting “aromas of peach and apricot with hints of enticing citrus and tropical fruit. A brilliant balance of fruit and acidity creates lively, refreshing wines. Unique and complex flavors make this an excellent grape for table, dessert, and ice wines.”

La Crescent (FPS 01) — This white wine grape came from a cross of St. Pepin and a Swenson selection from V. riparia x Muscat Hamburg. According to the U of M website, trunks have survived at -36º F. Moderately disease resistant, the leaves sometimes exhibit downy mildew. La Crescent propagation has increased rapidly since its introduction in 2002.

The U of M website description states “La Crescent’s intense nose of apricot, peach, and citrus lends itself to superior quality off-dry or sweet white wines. The grape’s high acidity provides good structure for excellent dessert or late-harvest style wines.”
**Marquette (FPS 01)** – Marquette is a cousin of Frontenac and grandson of Pinot noir. This red wine variety originated from a cross of MN 1094, a complex hybrid of *V. riparia*, *V. vinifera*, and other *Vitis* species, with Ravat 262. The researchers at the University of Minnesota report that resistance to downy mildew, powdery mildew, and black rot has been very good, and that the open, orderly growth habit makes vine canopy management efficient. Marquette was officially introduced in 2006, and vines are in very high demand and short commercial supply.

The U of M website describes finished wines from Marquette as “complex, with attractive ruby color, pronounced tannins, and desirable notes of cherry, berry, black pepper, and spice on both nose and palate.”

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**Additional Eastern U.S. Information Sources on Cold-Season Varieties and Viticulture**

- Missouri State University  
  [http://mtngrv.missouristate.edu/mvec/index.htm](http://mtngrv.missouristate.edu/mvec/index.htm)
- North Carolina State University  
  [http://www.ces.ncsu.edu/resources/winegrape](http://www.ces.ncsu.edu/resources/winegrape)
- Northwest Berry & Grape Information Center  
  [http://berrygrape.oregonstate.edu](http://berrygrape.oregonstate.edu)
- Penn State University  
  [http://winegrape.cas.psu.edu](http://winegrape.cas.psu.edu)
- University of Vermont  
  [http://pss.uvm.edu/grape/Horticulture](http://pss.uvm.edu/grape/Horticulture)
- USDA-ARS Cold Hardy Grape Collection  
  [http://www.ars.usda.gov/AboutUs/docs.htm?docid=6245](http://www.ars.usda.gov/AboutUs/docs.htm?docid=6245)