

Annual Report 2007

Evaluation of Wine Grape Cultivars and Selections for a Cool Maritime Climate

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Summary

In 2007 the Growing Degree Days (GDD) at WSU Mount Vernon NWREC were recorded at 1499, below the average range [compared to 1600 in 2006, 1727 in 2005 and 1817 in 2004]. At Everson 1684 GDD were recorded [compared to 1948 in 2006, 1867 in 2005 and 2075 in 2004] using Avatel data logging units.

Trial results to date support the proposition that high quality wine grapes can be grown in western Washington even at some of the coolest sites, provided that a careful choice of the appropriate cultivars and rootstocks is made for each site. In the coolest areas (1600 GDD and below), red cultivars such as Pinot Noir Precocé and Agria have ripened and produced good wines. Other early red cultivars that look promising include Garanoir, Rondo and Zweigelt. When grown on rootstocks, juice analysis has shown brix and acid values well in the range for successful wine making. An interesting new wine is being made for the first time from the early red variety Muscat of Norway. Good early ripening white cultivars are Sigerrebe, Burmunk, and Madeleine Angevine when grafted onto rootstocks. Preliminary results also show Ortega ripening at low heat unit levels.

In mesoclimates with 1600-1900 GDD, in addition to the earliest ripening cultivars noted above, Iskorcka, Pinot Gris (Ruhlander, cl. 146), Auxerrois, and Optima are promising whites. Among the reds, Regent (for organic growers), St. Laurent (on rootstocks), Zweigelt, Agria, and several early Pinot Noir clones should be considered. On warmer sites in the Puget Sound region (above 1900 GDD) Gruner Veltliner, Pinot Gris and Sauvignon Blanc look promising, as well as Dolcetto, all Pinot Noir clones and Dornfelder among the reds.

Methods

Data collection as harvest season approaches consists of sampling of fruit for laboratory analysis of the juice to determine brix, pH and titratable acid. Berry sampling is done by taking berries from clusters on each plant for a sample of 30 berries. At harvest, yield of the plot is weighed and juice samples are collected for analysis as the grapes are being crushed.

Trial categories

1. Cultivar Trials

The trial initiated in 2000 presently consists of 23 cultivars, selections, and clones with emphasis on red wine production (see Appendix, Table 1). Plot design is a randomized block of 3 replications, with 5 plants per replication.

In 2004 an advanced cultivar trial on selected rootstocks was begun at WSU Mount Vernon NWREC consisting of 3 replications, with 5 plants per replication: Rootstocks are Millardet et de Grasset 101-14 and Couderc 3309. Cultivars are Garanoir, Madeleine Angevine, Optima, Ortega, Pinot Gris [Ruhlander clone], Pinot Gris clone 146, Regent, Schonburger, Siegerrebe and Sylvaner. Aim of this trial is to see if the rootstocks already tested with Pinot Noir 2A will enhance the ripening of other cultivars.

2. Cultivar screening

Certain selected cultivars are screened to determine if they should be added to the main replicated trial. Most of the plants are self rooted and some are grafted on selected rootstocks where available. The pretest consists of 3 plants per cultivar, non-replicated.

3. Rootstock Trial

The rootstock trial was downsized in 2004 from 7 rootstocks to the 3 best performing rootstocks (from data and observations 2001-2003). It now consists of Pinot Noir 2A grafted on Couderc 3309, Millardet et de Grasset 420A and Millardet et de Grasset 101-14 plus a self rooted control. Replications consist of five plants on each rootstock, replicated five times at the WSU Mount Vernon NWREC plot, with the exception of the self rooted control at WSU Mount Vernon NWREC which is replicated only 3 times.

4. Cultural Studies

1. *Spacing* – In 2004, a vine spacing trial was initiated, consisting of replicated plots at 8' spacing between rows, with in-row spacing at 4', 6', 8' and 10' to evaluate the effect of various spacings on vine vigor, canopy management, production efficiency and overall vine balance. Cultivars included in the trial are Agria, Dornfelder, Pinot Noir 777 and Zweigelt. Vines are grafted on rootstocks Couderc 3309 and Millardet et de Grasset 101-14.
2. *Smart-Dyson training system* – In 2004 a trial row was selected in the Pinot Noir rootstock block and trained in the Scott-Henry system. This training system was revised in 2005, with cordons used instead of cane pruning in order to maintain vigor in the lower section of the vine. This spur pruned variant of the Scott-Henry system is referred to as "Smart-Dyson." The pruning system has been continued in 2006 and 2007. The row was compared with a control row which was trained in the standard Vertical Shoot Positioning (VSP) system.

Results

1. Cultivar trials

Data from 2007 are shown below. Only certain cultivars were harvested for wine making, due to budget considerations. Data from the trial at Everson was not collected, since cold damage to the vines occurred in several plots.

Table 1. Cultivar trial, WSU Mount Vernon NWREC – Sample date, average brix, pH, and titratable acid, (W=white)

Cv.	Test Date	Brix	pH	% T.A.
Siegerrebe (W)	25 Sept	18.8	3.48	0.47
Madeline Angevine (W)	27 Sept	17.2	3.08	0.83
Burmunk (W)	27 Sept	21.4	3.09	0.85
Pinot Noir Precoce /3309	5 Oct	20.6	3.39	0.60
Pinot Noir Precoce /101-14	5 Oct	20.4	3.39	0.66
Schonburger (W)	9 Oct	18.8	3.48	0.60
Pinot Noir Precoce / self	13 Oct	20.8	3.53	0.69
Agria / rootstock	13 Oct	18.4	3.63	0.66
Ortega (W)	24 Oct	20.6	3.15	0.81
Optima (W)	24 Oct	20.2	2.99	0.99
Auxerrois cl. 22 (W)	24 Oct	17.6	3.02	0.83
Iskorka (W)	24 Oct	20.6	2.98	0.99
Sylvaner (W)	24 Oct	16.6	2.92	1.07
Pinot Gris [Ruhlander] (W)	24 Oct	20.6	2.93	1.13
Kerner (W)	24 Oct	20.4	2.82	1.56
Dornfelder	26 Oct	14.4	3.06	0.80
Zweigelt	26 Oct	18.2	3.02	0.83
Muscat of Norway	26 Oct	19.0	3.06	0.84
Pinot Noir 777	26 Oct	19.8	3.12	1.08
St. Laurent	26 Oct	18.2	3.07	1.14
Rondo	26 Oct	19.4	3.12	1.17

In the variety/rootstock trial, a measured 15 foot row length was harvested from each of 4 cultivars grafted to Couderc 3309 rootstock, which had a heavier set. The fruit was weighed to determine yield, and juice samples taken at crushing were analyzed to determine wine making parameters.

Table 2. Cultivar and rootstock trial, WSU Mount Vernon NWREC – average brix, pH, titratable acid, and yield.

Cultivar	brix	pH	T. Acid	Yield (lbs/plot)*	Yield (T/A)
Dornfelder	14.4	3.06	0.8	70.0	12.7
Zweigelt	18.2	3.02	0.83	72.4	13.0
Agria	19.0	3.19	0.94	30.8	5.6
Pinot Noir 777	20.2	3.42	0.98	19.1	3.5

*(15 ft.measured row length)

3. Rootstock Trial

The trial of Pinot Noir clone 2a on various rootstocks was harvested on October 25, 2007. Juice samples were taken and analyzed at that time.

Table 3. Pinot Noir clone 2A grafted to selected rootstocks, WSU Mount Vernon NWREC – average brix, pH, titratable acid, and yield

Rootstock	brix	pH	T. Acid	Yield (lbs/plot)	Yield (T/A)*
101-14	18.9	3.03	1.22	17.3	1.6
420A	18.5	3.04	1.22	32.1	2.9
C3309	18.8	3.02	1.27	29.6	2.7
Self rooted	18.1	2.94	1.51	24.7	2.2

*based on 8 ft. x 6 ft. spacing

4. Cultural Studies

1. *Spacing* – Data not collected.

2. *Smart-Dyson training system* – Yield from the plots trained to the Smart-Dyson system was notably higher (50.6%) compared the standard VSP training system. Average yield per plot in the Smart-Dyson row was 43.6 lbs./plot compared to 20.4 lbs/plot for the adjacent row pruned in the VSP method. Juice samples from the Smart-Dyson plots were not collected.

Discussion

Evaluations of the wines produced from 2002–2006, and including the current 2007 harvest, have shown a number of promising cultivars suited for commercial production. For mesoclimates in the higher heat ranges of maritime western Washington, the number of cultivars available for selection increases. Based on the results of the trial to date, a number of new vineyards are being established in the Puget Sound region. New acquisitions continue to be added to the pretest to increase the varietal selections available in each mesoclimate. In addition, cultural practices are also being tested that have potential to improve the efficiency and reduce the cost of vineyard management, as well as promote wine quality.

Comparison of yields from 15 feet of measured row length from vines of the same planting year (Table 2) gives an indication of the potential production from some of the newer recommended cultivars. Crop load adjusted earlier in the season should increase fruit quality, and needs further study.

In the Pinot Noir rootstock trial, results showed that the values for titratable acid in all the Pinot Noir 2A plots were unacceptable for general wine making, due to the cold year with very low recorded heat levels. However, the crop was still acceptable for producing sparkling wine, which is being done in cooperation with a local wine maker. The difference between the self rooted plants and those grafted to rootstocks remained clearly evident in the significantly lower titratable acid of the grafted plants compared to the own rooted plants (Table 3). This emphasizes the importance of selecting the earlier ripening Pinot Noir clones for cooler sites.

Recommendations

Results of the trials to date have clearly shown that high quality wine grapes can be grown in western Washington, given careful choice of the appropriate cultivars and rootstocks, matched to a specific site. Certain rootstocks enhance ripening so that some cultivars when grafted on these rootstocks can potentially ripen at lower GDD levels than own-rooted plants of the same variety. Based on current trials, the variety guidelines for planting have been updated (Table 4). We are still studying the effects of these rootstocks on the different cultivars, so keep in mind that the information below is a guideline not a rule. Cultivars grafted on rootstocks can sometimes mature successfully in areas with lower GDD depending on the specific variety and rootstocks, soil conditions and other factors.

Table 4. Variety guidelines according to Growing Degree Days¹

(W=white wine variety, R=red wine variety)

Under 1600 GDD	1600–1900 GDD	Above 1900 GDD
Pinot Noir Precoce (R) Garanoir (R) Leon Millot (R) Muscat of Norway (R) Siegerrebe (W) <i>When available:</i> Rondo (R) Burmunk (W)	Pinot Noir cl. 667 (R) Pinot Noir cl. 777 (R) Pinot Noir cl. 115 (R) Agria (R) Regent (R) Zwiagelt (R) Marechal Foch (R) St. Laurent (R) Pinot Gris [Ruhlander] (W) Madeleine Angevine (W) Muller-Thurgau (W) Iskorka (W) Ortega (W) Optima (W) Sylvaner (W) Auxerrois Blanc (W) <i>When available:</i> Golubok (R) <i>Also everything in left column</i>	Pinot Noir [all clones] (R) Dornfelder (R) Dunkelfelder (R) Gamaret (R) Dolcetto (R) Chardonnay cl. 76 (W) Sauvignon Blanc (W) Kerner [Kernling] (W) Red Traminer (W) Gruner Veltliner (W) <i>Also everything in left columns</i>

¹Revised from Bulletin EB 2001, Growing Wine Grapes in Maritime Western Washington, Moulton and King, 2005.

At the coolest sites be careful in choosing which cultivars to plant to achieve consistent ripening. Remember that grafting vines to an appropriate rootstock will increase the chances of ripening a specific variety.

In some of the coolest sites, such as WSU Mount Vernon NWREC (1600 GDD and below), several cultivars have produced very good wines with unique qualities. **Pinot Noir Precoce** has performed very well in these conditions even with own-rooted plants. Grafting this variety to a rootstock such as Millardet et de Grasset 101-14 or Couderc 3309, which have been shown to promote earlier ripening in the WSU Mount Vernon NWREC trials, will expand its possibilities even further. **Leon Millot** is an early red variety that has potential for organic production due to its good disease resistance. **Auxerrois** on rootstock performed well in 2007; although the brix was relatively low, acids were also low, suggesting that a good quality wine can be produced even in these cool seasons.

In the intermediate sites from 1600–1900 GDD **Agria**, a *teinturier* red variety with distinctive berry flavored juice, is productive and also adapts to the coolest sites when grafted on selected rootstocks. **Regent** has good disease resistance, which suggests its use in organic plantings.

On warmer sites in the Puget Sound region (above 1900 GDD) several cultivars have stood out in the current trials. In addition to earlier cultivars listed above, **Gruener Veltliner**, **Kerner**, and certain clones of **Sauvignon Blanc** (white) have performed very well and should be considered as future possibilities. Included among the red wine cultivars for warmer sites are all **Pinot Noir** clones, **Dolcetto**, and **Dornfelder**.

For more information and detailed recommendations on culture and suitable cultivars, see [EB2001, Growing Wine Grapes in Maritime Western Washington](#), December 2005.

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Appendix – Cultivars/Selections and Rootstocks on trial

Table 1. Main variety evaluation 2007 (3 replications)

* = Mount Vernon only, ** = Everson only

Agria Auxerrois cl 22Gm* Burmunk* Chardonnay 76* Dornfelder Gamaret**	Garanoir Golubok* Iskorka* Kerner Muscat of Norway* Optima*	Pinot Noir 23 Pinot Noir 115 Pinot Noir 667 Pinot Noir 777 Pinot Noir Precoce* Pinot Pommard*	Regent Rondo* Schonberger Sylvaner* Zweigelt
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Table 2. Pretest, 2007 (3 plants per cultivar, self rooted except as noted, non-replicated)

* = Mount Vernon only, ** = Everson only

Aligote** Auxerrois cl. 22 Auxerrois / Riparia Chardonnay 76 / 101-14 Dolcetto** Gamaret Goesji Zumalos / 3309 Gruner Veltliner / 101-14 Heroldrebe / 3309 Italian Merlot / 3309 Kekoyelve Kerner Kerner / 101-14 Lagrein** Aligote**	Leon Millot** Madeleine Angevine Malbec** Muller Thurgau Muscat of Norway Optima Ortega Perle of Csaba Phoenix Pinot Gris [Ruhlander] Pinot Noir 115 / Riparia Pinot Noir 777 / 44-53M Pinot Pommard / Riparia Pitos	Plai* Red Traminer Red Traminer / 3309 Red Traminer / 5B Regner* Reisland / 101-14 Riesling Muscat / 3309 Sauvignon Blanc 01 / 420A Sauvignon Blanc Musque / 3309 Siegerrebe Siewiernyl / 330Malbec**
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Table 3. Pinot Noir Rootstock Trial (5 replications, control 3 replications, planted 2000)

Pinot Noir 2A self rooted (control) Pinot Noir 2A/Couderc 3309

Pinot Noir 2A/Millardet et de Grasset 101-14 Pinot Noir 2A/Millardet et de Grasset 420A

SUPPLEMENTAL PINOT NOIR CLONES (3 replications each, planted 2004)

Pinot Pommard/Couderc 3309
Pinot Noir Precoce/Couderc 3309
Pinot Noir Precoce
/Millardet et de Grasset 101-14
Pinot Noir 23/Millardet et de Grasset 101-14

Pinot Noir 667/Millardet et de Grasset 101-14
Pinot Noir 115/Millardet et de Grasset 101-14
Pinot Noir 777/Millardet et de Grasset 101-14

Table 4. Replicated Spacing Trial (spacing between plants at 4', 6', 8', 10')

Agria/Couderc 3309
Agria/ Millardet et de Grasset 101-14
Dornfelder/Couderc 3309

Pinot Noir 777/Couderc 3309
Zweigelt/Couderc 3309
Zweigelt/ Millardet et de Grasset 101-14

Table 5. Variety & Rootstock Trial (3 replications, rootstocks Couderc 3309 and Millardet et de Grasset 101-14)

Garanoir
Madeleine Angevine
Optima Ortega

Pinot Gris [Ruhlander]
Pinot Gris #146 Regent

Schoenburger
Siegerrebe Sylvaner