

## Annual Report 2005

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

G.A. Moulton and J. King

#### Summary

In 2005 the weather conditions were within the normal range from the beginning of April to the end of October. Early in the year the months of January and February were unusually warm, then this period was followed by cool wet weather in April, May and June. July, August and September were warm and dry, and October was within the normal 40-year average for temperature and precipitation. Vines trained to the VSP and Scott-Henry systems had clusters exposed early, approximately 2 weeks after berry set, and suffered little or no rot at either the Mount Vernon or the Everson locations. At the Mount Vernon site 1727 Growing Degree Days (GDD) were recorded and 1867 GDD at Everson using Avatel data logging units (to October 31, 2005).

A full crop was produced from many of the trial plots at Mount Vernon and Everson. However, certain varieties sustained damage from early bunch stem necrosis (EBSN) and toward the end of the harvest there was also some loss of crop due to bird damage. In the main replicated plots, cultivars vinified in 2005 included varietal wines from both red and white wine cultivars, as well as several white wine blends. This includes the wine from the replicated Pinot Noir rootstock trial, which was also used for cultural studies.

After seeing results of the rootstock trials in 2002 and 2003, new planting in 2004 included additions to the pretest and an advanced (replicated) cultivar trial grafted to one of the 3 promising rootstocks. This trial includes standards like Madeleine Angevine, Siegerrebe and several Pinot Noir clones, along with promising cultivars from the pretest and main trial. Most of these were planted in spring 2004, but were moved in fall 2004 and should begin fruiting in 2006, and data will be collected if funding is maintained. Aim of this trial is to see whether the rootstock effects observed in Pinot Noir 2A will also carry over to other varieties. A spacing trial including several of the promising cultivars grafted onto two different rootstocks was also established and preliminary harvest data from the trial is anticipated in 2006.

Collecting and analyzing harvest data and producing wines for evaluation continued in 2005. Cooperation of area winemakers is engaged in the post-harvest evaluation of varieties suitable for wine production (see Discussion & Recommendations, below.) Evaluation of previous vintages of 2003 and 2004 is continuing, and the 2005 wine crop is in process of vinification.

#### Methods

Data collection in this trial consists primarily of weekly sampling of fruit as harvest season approaches, and laboratory analysis of the juice to determine brix, pH and titratable acid. Berry sampling is done by taking 10 berries from each plant for a sample of 50 berries from each 5-plant replicated plot in the rootstock and cultivar trials. Each plot is replicated 3 times. (In the pretest plots with only 3 plants per cultivar, berry samples are collected from all 3 plants.) At harvest, yield of the plot is weighed and juice samples are collected for analysis as the grapes are being crushed.

#### Project categories

##### 1. Cultivar Trials

The trial initiated in 2000 presently consists of about 25 cultivars, selections, and clones with predominant emphasis on red wine production (see Appendix, **Table 1**). Plot design is a randomized block of 3 replications, with 5 plants per replication. At the Mount Vernon site, row spacing is 10' rows with 6' between plants. At Everson the spacing is 9' rows with 5' between plants, and 10 cultivars are included in the replicated trial.

In 2004 an advanced cultivar trial on selected rootstocks was begun at Mount Vernon consisting of 3 replications, with 5 plants per replication, spaced in 8' rows with 5' between plants: Rootstocks are Millardet et de Grasset 101-14 and Coudrec 3309. Cultivars are Agria, Dornfelder, Dunkelfelder, Garanoir, Leon Millot, Madeleine Angevine, Optima, Ortega, Pinot Gris [Ruhlander clone], Pinot Noir 777, Regent, Reichensteiner, Schonburger, Siegerrebe and Sylvaner, all of which have performed well at the trial sites. Additional plantings in the rootstock block include several more Pinot Noir clones and Pinot types on the rootstocks Coudrec 3309 and Millardet et de Grasset 101-14.

##### 2. Pretest

The pretest (see Appendix, **Table 2**) screens potential cultivars, to determine if they should be added to the main replicated trial, from which varietal wines can be produced for evaluation. The pretest consists of 3 plants per cultivar, replicated once. Promising grapes from the pretest will be multiplied, replicated and added to the main trial.

##### 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 the 3 most promising rootstocks (Coudrec 3309, Millardet et de Grasset 420A and Millardet et de Grasset 101-14) plus a self rooted control. Each rootstock is evaluated for its effect in terms of maturity, yield, and quality compared with self rooted plants. Replications consist of five plants on each rootstock, replicated three times at the Everson plot and five times at the Mount Vernon plot (see Appendix, **Table 3**).

#### 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. This planting was relocated in the fall of 2004. Cultivars included in the trial are Agria, Dornfelder, Dunkelfelder, Pinot Noir 777 and Zweigelt.
2. *Scott-Henry training system* – In 2004 a trial row was selected in the Pinot Noir rootstock block and trained in the Scott-Henry (S-H) system. This training system was maintained in 2005 but cordons were used instead of cane pruning in order to maintain vigor in the lower section of the vine. This spur pruned Scott-Henry system is sometimes referred to as "Smart-Dyson." Fruit from this row was compared with the control row which was trained in the standard Vertical Shoot Positioning (VSP) system.
3. *Ethrel application* – To test the effect of Ethrel application in mid season as an aid in canopy management, a trial row was selected in the Pinot Noir rootstock block and material applied to the canopy area by backpack sprayer. On July 13, 2005 an application of 300 ppm (approx. 100gal/A) was made to the test row, applied only to the leafy canopy. This row was compared with the control row which did not receive any Ethrel applications.

## Results

### 1. Cultivar trials

Harvest dates are based on laboratory analysis of juice samples collected as described in Methods, (above.) Some variation has been noted between the results of analysis from pre-harvest juice samples and the juice samples collected and analyzed as the grapes are being crushed. (See Table 7, below, for an example.)

**Table 1. Cultivar trial, Mount Vernon - Harvest date, average brix, pH and percent titratable acid, in harvest order (W=white)**

Cultivar	Harvest	avg brix	pH	% t. acid
Schonburger (W)	Sept 22	17.2	2.88	0.71
Burmunk (W)	Sept 22	19.3	3.19	0.73
Iskorka (W)	Sept 22	20.8	3.05	0.86
Pinot Noir Precoce	Sept 29	21.3	3.31	0.81
Agria	Sept 29	20.0	3.39	0.95
Rondo	Oct 5	20.8	3.29	1.02
Garanoir	Oct 11	19.1	3.65	0.63
Zweigelt	Oct 11	21.1	3.58	0.81
Dornfelder	Oct 11	18.0	3.58	0.90
Auxerrois cl. 22 (W)	Oct 11	18.0	3.57	0.92
Sylvaner (W)	Oct 11	16.0	3.52	0.98
Regent	Oct 11	22.6	3.69	1.07
Golubok	Oct 11	21.0	3.65	1.31

**Table 2. Cultivar trial, Everson - Harvest date, average brix, pH and percent titratable acid, in harvest order (W=white)**

Cultivar	Harvest	avg brix	pH	% t. acid
Schonburger (W)	Sept 22	20.0	3.15	0.75
Agria	Sept 30	20.0	3.28	0.63
Garanoir	Oct 11	20.0	3.32	0.59
Dunkelfelder	Oct 11	19.1	3.21	0.86
Regent	Oct 11	22.4	3.32	0.78
St. Laurent	Oct 11	20.0	3.09	0.85
Zweigelt	Oct 11	19.0	3.09	0.83
Dornfelder	Oct 11	18.0	3.11	0.87
Gamaret	Oct 11	18.6	2.93	1.04
Kerner (W)	Oct 11	20.0	2.83	1.31

### 2. Pretest

Harvest data from the pretest (3 plants/plot) 2005 are shown below.

**Table 3. Pretest cultivars, Mount Vernon – Harvest date, brix and titratable acid (in harvest order, R = red wine cultivar)**

Cultivar	Harvest	avg brix	pH	% t. acid
Siegerrebe	Sept 22	22.6	3.62	0.54
Ortega	Sept 22	21.0	3.20	0.89
Optima	Sept 30	16.6	3.17	1.02
Madeleine Angevine	Sept 30	19.1	3.39	0.77

Muscat of Norway (R)	Sept 30	17.6	3.24	0.71
Leon Millot (R)	Oct 11	18.7	3.75	0.74
Pinot Noir 115 (R)	Oct 11	19.8	3.71	0.80
Reichensteiner	Oct 11	22.0	3.67	0.86
Pinot Noir 777 (R)	Oct 11	19.8	3.68	0.93
Pinot Gris [Ruhlander]	Oct 11	20.2	3.53	0.98
Muller-Thurgau	Oct 11	18.6	3.42	0.99
Pinot Pommard/Riparia (R)	Oct 11	18.1	3.61	1.17
Chardonnay 76	Oct 11	18.8	3.52	1.19
Plai (R)	Oct 11	17.6	3.57	1.25
Kerner	Oct 11	19.0	3.41	1.58

**Table 4. Pretest cultivars, Everson – Harvest date, brix and titratable acid (in harvest order, R = red wine cultivar)**

Cultivar	Harvest	avg brix	pH	% t. acid
Siegerrebe	Sept 22	23.6	3.47	0.49
Ortega	Sept 22	22.2	3.50	0.78
Optima	Sept 30	20.0	2.96	0.88
Madeleine Angevine	Sept 30	20.7	3.02	0.78
Leon Millot (R)	Oct 11	19.1	3.39	0.74
Reichensteiner	Oct 11	21.2	3.12	0.80
Muller-Thurgau	Oct 11	18.8	3.06	0.86
Red Traminer	Oct 11	22.6	3.30	0.92
Sylvaner	Oct 11	17.6	3.06	0.92
Dolcetto (R)	Oct 11	18.6	3.10	0.95
Pinot Gris [Ruhlander]	Oct 11	21.8	3.16	0.96
Chardonnay 76	Oct 11	21.2	3.06	1.07
Aligote	Oct 11	15.6	3.02	1.07
Gamay Beaujolais (R)	Oct 11	16.2	3.00	1.17
Gamay Rouge (R)	Oct 11	17.0	3.04	1.21
Lagrein (R)	Oct 11	16.0	2.97	1.41
Baco 1 (R)	Oct 11	21.8	2.75	1.68

Most of the cultivars and selections in the pretest produced enough fruit for evaluation in 2004, and several of them yielded enough for wine making in either single varietals or blends, when crops from Mount Vernon and Everson plots were combined. Some varieties lost most of their fruit due to the physiological disorder EBSN (see Discussion for detailed remarks.) Cultivars were evaluated for their performance, and those that did not do well were scheduled for discard.

### 3. Rootstock Trial

The Pinot Noir trial was harvested on October 11, 2005. Juice samples were taken and analyzed with results shown below.

**Table 5. Rootstock trial – Mount Vernon 10/11/05 – Average brix, pH and, titratable acid (in ascending order by titratable acid)**

Rootstock	brix	pH	% t.a.
420A	20.0 a	3.64 a	0.94 c
101-14	18.7 a	3.55 ab	1.10 cb
C3309	18.9 a	3.53 ab	1.18 b
self rooted	18.6 a	3.45 b	1.42 a

**Table 6. Rootstock trial - Everson 10/11/05 – Average brix, pH and, titratable acid (in ascending order by titratable acid)**

Rootstock	brix	pH	% t.a.
101-14	19.5 a	3.16 a	0.87 a
420A	19.9 a	3.13 a	0.92 a
C3309	19.9 a	3.09 a	1.00 a
self rooted	19.7 a	3.04 a	1.07 a

**Table 7. Comparison of average brix, pH and, titratable acid** for Pinot Noir 2A pre-harvest test (all plots averaged) with juice tested at harvest pressing

Juice test	brix	pH	% t.a.
Mount Vernon – pre harvest average	19.1	3.55	1.11
Mount Vernon – juice pressed	20.6	3.04	1.13
Everson – pre harvest average	19.8	3.11	0.96
Everson – juice pressed	20.8	3.60	0.99

#### 4. Cultural Studies

1. *Spacing* – Though some fruit was produced in these plots in 2005, it was insufficient to provide data of any significance.
2. *Scott-Henry Training System* - Comparison of pre-harvest juice tests between the row trained to the Scott-Henry system and the adjacent row trained to a VSP system showed no significant differences in brix, pH or percent titratable acid.
3. *Ethrel application* – Ethrel applications were made in July and August and observations taken of the subsequent vine growth to compare treated and untreated rows. Due to lack of funds for data collection, no direct measurement (e.g. pruning weights) was taken. Observation indicated, however, that there was a visible reduction in shoot development in treated versus non-treated plants.

## Discussion

In the In the rootstock trial at Mount Vernon, juice samples from Pinot Noir 2a grafted on Millardet et de Grasset 101-14, Millardet et de Grasset 420A and Coudrec 3309 rootstocks had significantly lower TA levels than samples from self rooted plants. Values for pH showed a significant difference between the plants grafted to 420A and self-rooted plants, though differences in pH were not significant for 101-14 and C3309. Differences in brix were not statistically significant though tending to indicate higher brix in the grafted plants than the self-rooted plants. Overall the results from 2005 are consistent with data from previous years in showing that these 3 rootstocks are effective in advancing maturity of Pinot Noir compared to self rooted plants.

Data from the Everson rootstock trial indicated the same trend as in Mount Vernon but did not reach levels of statistical significance. Since Everson is a warmer site than Mount Vernon, the data suggest that selection and use of specific rootstocks to advance fruit maturity is more crucial in sites where heat levels are marginal.

Comparison of the average values from pre-harvest fruit samples with values for juice tested at pressing (Table 7, above) shows that pre-harvest test samples under-reported the brix compared with the juice analyzed from the harvest pressing, in both the Mount Vernon and Everson samples. Values for titratable acid were also somewhat under-reported.

Cultural experiments carried out in the Pinot Noir trial plot in 2005 included evaluation of one row converted from the standard Vertical Shoot Positioning (VSP) system to the Scott-Henry system described above. No significant differences in juice composition were seen in 2005 (data not shown) and any difference in yield could not be quantified due to bird damage in some plot areas.

Use of Ethrel applications in July was also tested for its effect on reduction of shoot growth. A reduction in top growth of new shoots was observed in the canopy of the treated rows. This suggests that use of Ethrel applications in canopy management has some potential for saving of labor and expense by reducing the amount of hedging etc. needed in the canopy. A second application at veraison may advance fruit maturity, an effect that has been observed with its use in other countries, e.g. New Zealand.

Cultural trials involving variations in vine spacing have not yet begun fruiting so no data was available from that portion of the trial.

## 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 varieties and rootstocks, and selection of a good site. For more information and detailed recommendations on culture and suitable varieties, see [EB2001, Growing Wine Grapes in Maritime Western Washington](#), December 2005.

## Acknowledgements

Support for this project in 2005 has been provided by the Northwest Center for Small Fruit Research. The help and participation of cooperators and volunteers in harvesting and winemaking is gratefully acknowledged.

## Appendix – Cultivars/Selections and Rootstocks on trial

**Table 1. Main variety evaluation 2005 (\* = Mount Vernon only, \*\* = Everson only)**

Agria	Garanoir	Pinot Noir 23	Rondo*
Auxerrois cl. 22 GM*	Golubok*	Pinot Noir 115	Schonburger
Burmunk*	Iskorka (54-36-33)*	Pinot Noir 667	St. Laurent
Chardonnay 76*	Kerner	Pinot Noir 777	Sylvaner*
Dornfelder	Muscat of Norway*	Pinot Pommard*	Zweigelt
Dunkelfelder	Nero*	Pinot Noir Precoce*	
Gamaret**	Optima*	Regent	

**Table 2. Pretest, 2005 (\* = Mount Vernon only, \*\* = Everson only)**

Aligote**	Gruner Veltliner	Malbec**	Pinot Noir 777**	Reisland
Auxerrois cl. 22 Gm**	i 31-67*	Muller Thurgau	Pinot Noir Dijon 113*	Rubin Tairofsky*
Baco 1**	Kerner**	Optima	Pinot Noir Precoce**	Saperavi
Bianca*	Lagrein**	Ortega	Pitos	Sauvignon Blanc 01
Chardonnay 76**	Laurot*	Perle of Csaba	Plai*	Sauvignon Blanc Musque
Dolcetto**	Leon Millot	Petra [SK 77-5/3]*	Rani Riesling*	Siegerrebe
Gamay Chaudenay*	Liza [SK 77-12/6]*	Phoenix	Red Traminer*	Sylvaner**
Gamay Freaux*	Madeleine Angevine	Pinot Gris [Ruhlander]	Regner*	
Gamay Rouge*	Madeleine Sylvaner*	Pinot Noir 115**	Reichensteiner	

**Table 3. Rootstock Trial (Pinot Noir 2A)**

Control - own root	Couderc 3309	Millardet et de Grasset 101-14	Millardet et de Grasset 420A
--------------------	--------------	--------------------------------	------------------------------

**Supplemental Pinot Noir clones (3 replications each, planted 2004)**

Pinot Pommard/Couderc 3309	Pinot Noir Precoce/Millardet et de Grasset 101-14	Pinot Noir 777/Millardet et de Grasset 101-14
Pinot Noir Precoce/Couderc 3309	Pinot Noir 23/Millardet et de Grasset 101-14	Pinot Noir 115/Millardet et de Grasset 101-14
	Pinot Noir 667/Millardet et de Grasset 101-14	

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

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

**Table 5. Replicated Variety & Rootstock Trial (Rootstocks Couderc 3309 and Millardet et de Grasset 101-14)**

Garanoir	Ortega	Schonburger
Leon Millot	Pinot Gris [Ruhlander]	Siegerrebe
Madeleine Angevine	Regent	Sylvaner
Optima	Reichensteiner	