Vintage 2008: Umpqua Valley Reference Vineyard Report

Summary:
The cool climate conditions observed prior to and during the early part of the 2008 vintage resulted from a colder than normal North Pacific Ocean coupled with La Niña conditions in the tropical Pacific. Overall a relatively cold late winter took us into a very cool spring with March and April temperatures across the state anywhere from 2-4°F below normal. The month of May followed with a ten day spell of extreme heat with days as much as 20-25°F above normal (temperatures > 100°F). June through September provided normal swings between warm and cool periods but was punctuated by a frost/freeze event in mid-October like never seen before in many locations throughout the western U.S., but which was less severe in the Umpqua than elsewhere. Rainfall during the growing season was 40-60% less than normal, but with some rain during the ripening period in late September and early October. Growing degree-day totals averaged 2243 for the nine reference vineyards (less than 2005 but more than 2007) with a range of over 800 degree-days driven mostly by variations in elevation. Phenological timing of the observed varieties started off delayed by 2-4 weeks but ended up near average. Due to the late and highly variable early vintage weather, fruit composition in mid-September was behind the development seen in past years. However, the weather from mid-September to mid-October cooperated and provided conditions that appear to have allowed most growers to reach average harvest composition levels and normal yields.

Project Overview:
The goals of the project were to set up a suite of reference vineyards that monitor temperature, phenology, and composition of important varieties grown in the Umpqua Valley AVA. The purpose of the research is to provide an in depth look at spatial variations in important weather, plant, and yield parameters in the region.

During 2003-04 nine reference vineyards were established across a north-south transect throughout the Umpqua Valley AVA at elevations ranging from 335 ft to 1154 ft (642 ft average). The spatial and elevation makeup of the reference vineyards is intended to capture a range of site variability typically found in the Umpqua Valley.

The initial varieties chosen for the trial plantings (in 2003-04) were Tempranillo clone 01, Tempranillo clone 02, Syrah clone 01, Grenache clone 04, Malbec clone 04, and Viognier clone 01. During 2004-05, Pinot Noir (Pommard clone), Pinot Gris (clone 2), and Riesling (Wente clone) where added to the trial. These trial plantings are in various stages of development with four locations contributing observations from the fourth leaf of the plantings. However, due to the time needed for growth, the project participants decided to monitor phenology and composition of five existing varieties: Pinot Noir, Pinot Gris, Syrah, Tempranillo, and Merlot. While not all of the reference vineyards have every interim variety, those chosen provide a reasonable suite of variety/site combinations that can be monitored as the trial plants become more established.

To measure temperature at each site, HOBO® H8 Pro-Temperature Loggers were installed at each of the reference vineyards. The sensors record at 15 minute intervals and the data is collected from each site just after the growing season is over (after Oct 31). The temperature data is then aggregated to hourly and daily average, maximum, and minimum values and finally summarized by site for the dormant (Nov 1 – Mar 31) and growing season (Apr 1 – Oct 31).

Phenological observations for bud break, flowering, véraison, and harvest for the interim varieties are submitted by each reference vineyard. The phenological data is then examined for average dates and intervals between dates for the entire region and by variety.

For composition information, varietal samples are taken on September 13th each year from the interim varieties observed (this year was the third year the trial varieties were also sampled in the same manner). The date was chosen as it represents a "snapshot" of fruit maturity that is not dependent on the subjective determination of ripeness for a given wine style. This date also represents an estimated mid-point of the véraison to harvest period leaving roughly 2-4 weeks before picking. One hundred berry samples are collected and then analyzed for °Brix, titratable acidity, pH, and berry weights using standard industry methods. From the sampling, a report is sent out during the last week of September to all members of the Umpqua Valley Winegrowers Association. In addition, the reference vineyards submit harvest composition at the end of the season (°Brix, titratable acidity, pH, and yields). In most cases the data came from the wineries where the fruit was processed, while in other cases the values came from field observations. Therefore, the harvest composition data is not as consistent in terms of measuring techniques or devices. The composition data are then summarized by region and variety.

Results:

Regional Climate

The winter of 2007-08 (November 1 through March 31) was characterized by much cooler than normal conditions throughout the region that resulted from a colder than normal North Pacific Ocean coupled with La Niña conditions in the tropical Pacific. For Roseburg, the winter was 2.5 degrees cooler than average with the coldest conditions occurring in late November and late January into early February (Figure 1). From mid-February there was a period of generally warmer than average temperatures that lasted through early March, then a substantially colder than normal March and the first half of April, followed by a brief warm period in mid-April and then a cooler period that lasted until the first week of May. While not a cold as the Rogue Valley, the nighttime temperatures reached into the low 30s throughout much of April. May 15-20 brought the highest heat spikes of the summer with daytime temperatures as much as 24 degrees above normal (temperatures > 100°F) and was the highest temperatures observed in May in the region over the last 10 years. Temperatures from May through the end of August fluctuated between broad cool and warm periods that were moderate to slightly above normal with fewer heat spikes as compared to the last few years (Figure 1)

A delayed bud break started in the third and fourth weeks of April, followed by a late bloom during the third week of June. The period leading up to véraison was moderate with a small heat spike preceding the region-wide average date (see more in the phenology section that follows). Véraison was followed by a cool start to the month of September with temperature departures of up to 12 degrees below normal after which the rest of September was moderately warmer than normal. The second week of October saw the near ideal conditions come to an end with temperatures that dropped into the upper 20s to the low 30s, roughly 12 degrees below normal. During October 9-12, temperatures from British Columbia all the way to Paso Robles reached record lows for that early in the fall and, while the Umpqua Valley was not as cold as other locations, records were set in the region. During the growing season daily temperature departures observed at the Roseburg weather station were -0.4°F cooler than the 1971-2000 climate normals and near the average of the last 5 years. The growing season ended up with April, June, and October being below normal, and May, July, August, and September above normal (not shown). Of the four main wine growing regions in

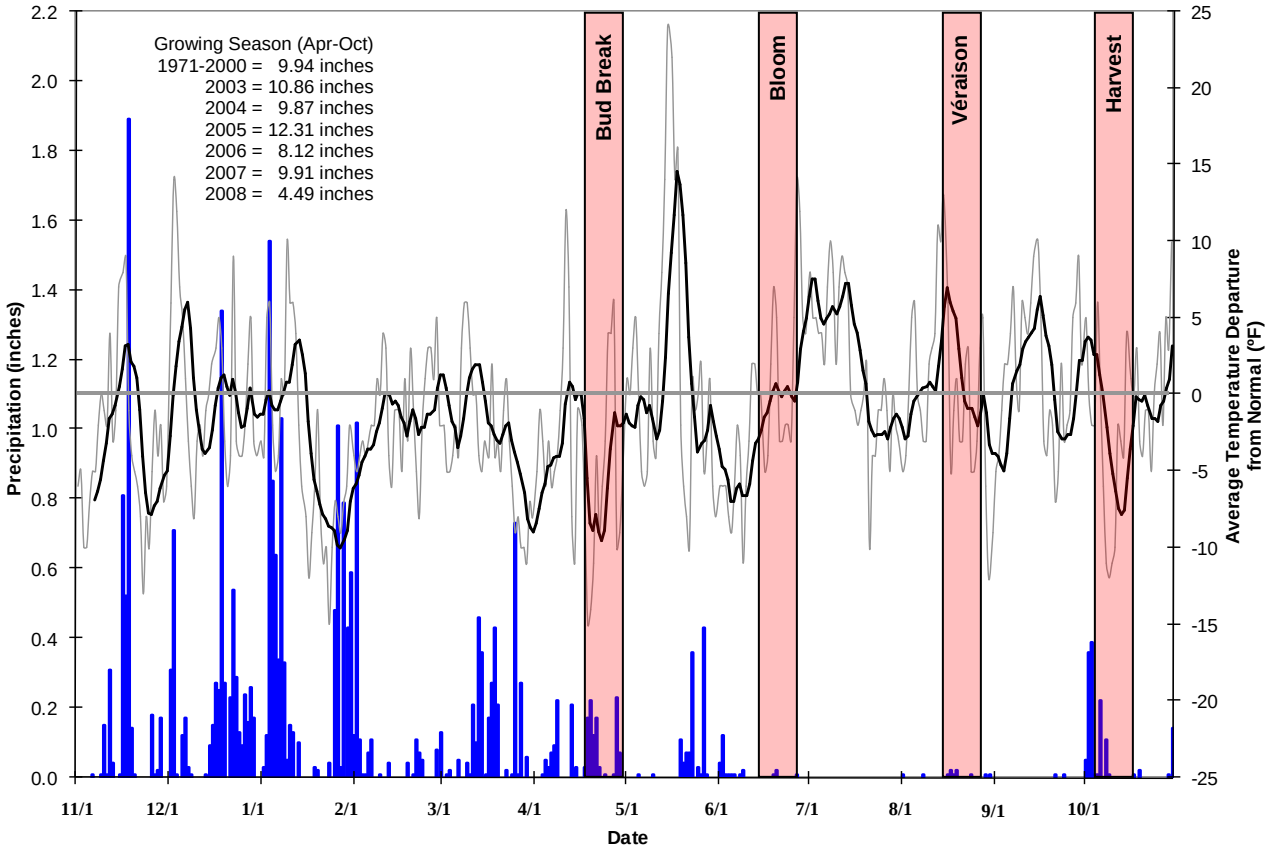

Figure 1 – Daily average temperature departures from normal and precipitation for November 1, 2007 to October 31, 2008 from the Roseburg weather station. The vertical red bars represent the variation in region-wide average phenology (see text for more details). The long-term average is derived from the 1971-2000 climate normals.

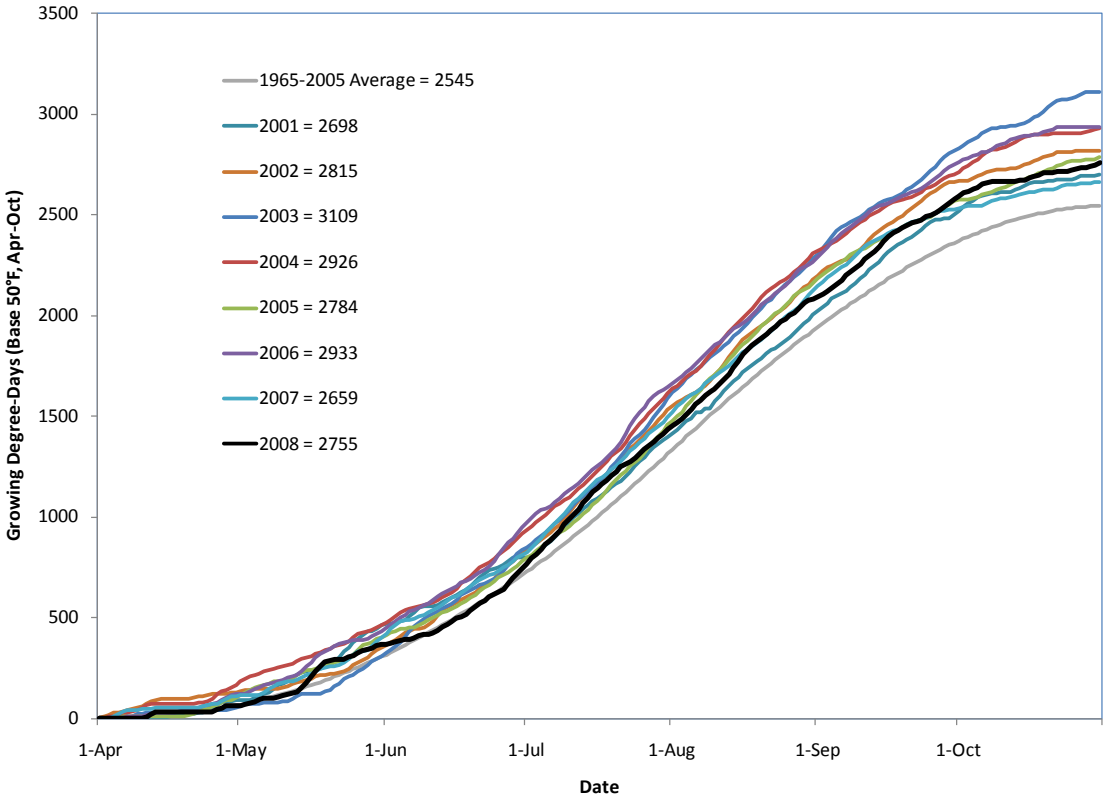

Figure 2 – Growing degree-day accumulation during April-October 2008 from the Roseburg weather station (base 50°F). The long-term average is derived from the 1971-2000 climate normals.

Oregon (Willamette, Rogue, and Umpqua valleys and eastern Oregon), the Umpqua Valley was warmer than the Willamette Valley and eastern Oregon and slightly cooler than the Rogue Valley for the 2008 vintage.

Rainfall from November through March was similar to the long term average for Roseburg (+0.49 inches), but was concentrated into five main rain periods that saw days with precipitation amounts greater than one inch. The growing season (Apr-Oct) saw rainfall amounts that were 55% below normal at 4.49 inches for the Roseburg weather station (Figure 1). For the first time in many years there was very little rainfall in the bloom period and it was followed by a dry period through véraison and the end of September. October started with over an inch of total rainfall during the first week followed by the cold snap during October 9-12, but little precipitation the rest of the month.

From a degree-day standpoint the spring started off much delayed and did not reach 100 degree-days until mid-May, which is over a month later than normal (Figure 2). The remainder of the summer was near normal in terms of degree-day accumulation and resulted in 2755 degree-days (April 1st through October 31st using a base of 50°F with no upper cut-off) observed at the Roseburg weather station (2627 at the Medford Agri-Met station in Jacksonville). This value is more than the 1965-2005 period of record average for Roseburg, but slightly cooler than the average of the last seven years (Figure 2). The 2008 growing season degree-days ended up very similar to the 2001 and 2007 vintages.

Reference Vineyard Climate Observations:

Dormant Period

The winter conditions of 2007-08 (Nov 1 through Mar 31) observed at the nine references were similar to those observed at Roseburg (see above) with variations coming from site characteristics and relative locations. Overall, the winter was 2-3 degrees cooler than the prior winter in terms of average and maximum temperatures, but similar in terms average minimum temperatures (Table 1). The nine sites observed in the Umpqua also varied more in terms of maximum temperatures than minimum temperatures during the winter, becoming very consistent over the study period. The absolute low temperatures for the reference vineyards during the winter reached into the upper teens during the third week of January with the lowest observation being 16.4°F. The number of days below 32°F, averaged across all reference vineyards was 52 with a range of 39 to 64 due to elevation, which was similar to the prior winter but significantly more than the first few years of the project.

Table 1 – Reference vineyard dormant period (November 1-March 31) climate characteristics for 2007-08.

Variable	*Mean*	*Standard Deviation*	*Maximum*	*Minimum*
Average Temperature (°F)	40.9	0.5	41.5	39.8
Average Maximum Temperature (°F)	49.6	1.3	52.0	48.0
Average Minimum Temperature (°F)	34.7	0.5	35.4	34.0
# of Days < 32°F	52	9.6	64	39

Growing Season

The 2008 growing season average degree-day accumulation from the nine sites was 2243 with a standard deviation of 252 units (Table 2). Maximum accumulation was 2521 degree-days while the minimum was 1717 degree-days. Average growing season temperatures ranged from 56.8 to 62.0°F, while average maximum temperatures ranged from 72.1 to 78.7°F and average minimum

temperatures from 45.3 to 46.7°F. The variation in site maximum temperatures was three times greater than that for minimum temperatures (standard deviation of 0.6 vs. 2.2°F), which is similar to past years. Growing season temperature extremes summarized from the reference vineyards saw the normal number of summertime heat spikes, with three main periods (mid-May, late June-early July,

Table 2 – Reference vineyard growing season temperature characteristics (April-October 2008).

Variable	*Mean-Median*	*Standard Deviation*	*Maximum*	*Minimum*
Growing Degree Days (base 50°F with no upper cut-off)	2243	252	2521	1717
Average Temperature (°F)	59.7	1.5	62.0	56.8
Average Maximum Temperature (°F)	76.7	2.2	78.7	72.1
# of Days > 95°F	19	9	31	7
Average Minimum Temperature (°F)	46.0	0.5	46.7	45.3
# of Days < 32°F	7	2.2	10	4
Last Spring Frost	Apr-20	7 days	May-9	Apr-19
First Fall Frost	Oct-11	0.5 days	Oct-12	Oct-11

Frost dates are given as the median date.

and mid-August). The absolute maximum temperature observed of 107.2°F occurred on August 16th. Site differences were clearly seen in absolute maximum temperatures with a range of nearly 10°F over the reference vineyards. The number of days over 95°F averaged 19, but ranged from 7 to 31 (note that in a normal year, the Roseburg weather station observes 27).

In terms of minimum temperatures and frost frequency, the 2008 growing season saw absolute minimum temperatures dip into the lower 20s in early April and upper 20s and low 30s in mid-April at the majority of the sites. The absolute lowest temperature during the growing season was 24.2°F in the first week of April. The fall frost/freeze observed across the western US in mid-October saw temperatures drop to 27-31°F in the reference vineyards, much more moderate than the low 20s seen elsewhere. Overall the average number of days during the growing season below 32°F was 7, with a range from 4 to 10 (Table 2). During the periods of the coolest nighttime temperatures in April and October, the range between the reference vineyards was less than 2.0°F. The median last spring frost date was April 20th for the reference vineyards with the earliest occurring on April 19th (most locations) and the latest on May 9th at two locations (Table 2). The first fall frosts came within a two day period in the mid-October event, with an average of October 11th.

Comparison to Previous Years

Comparing the four dormant periods during the study period shows that 2007-08 was cooler on average, with relatively lower absolute minimum temperatures and the same number of days below 32°F as experienced during the prior winter (Table 3). For the growing season, 2008 was 100 heat units higher than 2007, but below the five year average of 2357 growing degree-days observed over the locations (Table 3). For 2008 the lower degree-days were mostly a result of the cool April, cool last three weeks of October, and lower average minimum temperatures during the vintage. The range in degree-day values between reference vineyards was ~800 units, which has ranged from 700-900 over the period of study. During the 2008 growing season, the reference vineyards experienced average absolute maximum temperatures, but a slightly higher number of days above 95°F compared to the prior vintages. The 2008 vintage also saw greater frost potential with a lower absolute minimum and more days below 32°F. The average and absolute last spring frosts in 2008 were both

later than the five year average, while the first fall frost date averages and absolute date were earlier (Table 3).

Table 3 – Reference vineyard climate comparisons across the dormant (November 1–March 31) and growing seasons (April 1-October 31) for each year of the project.

Season/Variable	*Year or Period*					
Dormant Season	***2003-04***	***2004-05***	***2005-06***	***2006-07***	***2007-08***	***Average***
Average Temperature (°F)	NA	43.7	42.3	42.7	40.9	42.4
Minimum Temperature (°F)	NA	23.3	16.0	15.9	16.4	17.9
# of Days < 32°F	NA	34	32	52	52	43
Growing Season	***2004***	***2005***	***2006***	***2007***	***2008***	***Average***
Growing Degree-Days	2636	2302	2458	2144	2243	2357
Maximum Temperature (°F)	107.7	106.7	110.2	103.7	107.2	107.1
# of Days > 95°F	17	10	24	11	19	16
Minimum Temperature (°F)	33.9	30.1	23.3	28.5	24.2	28.0
# of Days < 32°F	0	2	4	2	7	3
Last Spring Frost	Apr-1*	Apr-14	Mar-27	Apr-20	May-9	17-Apr
First Fall Frost	Nov-5	Nov-4	Oct-26	Oct-27	Oct-11	27-Oct

The maximum and minimum temperatures are the absolute values recorded for the entire region for that year. Frost dates are the absolute latest and earliest observed over the entire region for that year. Note that the last spring frost in 2004 is from the Roseburg KQEN station observation, which correlates reasonably well with the reference vineyard sites in other years.

Phenology

Summarizing phenological observations across all varieties (including both the interim and trial varieties) and the region shows a median bud break of April 22nd with 16 day variation indicating high site/variety variation (Table 4). Bud break was observed as early as April 1st and as late as May 6th across the sites. Bloom averaged June 23rd with a range from June 16th to July 6th across the reference vineyards and all varieties. Véraison averaged August 19th occurring over a month long window from August 10th to September 11th, again indicating the high site/variety differences. Harvest dates occurred from September 30th to November 1st, with a median of October 15th (Table 4). Across the interim varieties, the phenological observations reveal minor to moderate differences in bud break, flowering, and véraison. Contrary to prior years, harvest dates showed low variation due largely in part to the frost/freeze event in mid-October. The median bud break dates were reasonably similar across the varieties, with Syrah the latest at April 28th. Median flowering dates were also fairly consistent across the varieties being earliest for Pinot Gris (June 21st) and latest for Syrah (June 27th). The median véraison dates occurred during mid to late August with Tempranillo the earliest (August 14th) and Pinot Noir the latest the latest (August 20th).

While harvest dates by variety tend to be more widely spread out over time (Table 4) due to grower or winemaker flavor, composition, or style characteristics, this year was less so due to the frost/freeze event in mid-October which resulted in more fruit coming in over a shorter period of time. On average, Merlot was brought in the earliest of the varieties (October 9th) while Syrah was the latest harvested (October 18th).

For the trial varieties third year of phenological data, bud break events varied by 10 days with Grenache the earliest (April 18th) and Syrah the latest (April 27th) (Table 4). Bloom across the trial varieties and sites occurred over a seven day window from June 21st (Pinot Noir and Pinot Gris) to

Table 4 – Umpqua Valley reference vineyard phenological dates for 2008. The data come from 35-45 observations for each event; however note that some of the varieties are only observed at a few sites.

Variety	*Bud Break*	*Flowering*	*Véraison*	*Harvest*
Average for all Varieties				
Median	4/22	6/23	8/19	10/15
Standard Deviation	8 days	6 days	9 days	9 days
Maximum	5/6	7/6	9/11	11/1
Minimum	4/1	6/14	8/10	9/30
Interim Varieties				
Merlot				
Median	4/22	6/22	8/17	10/9
Standard Deviation	8 days	8 days	8 days	6 days
Pinot Gris				
Median	4/25	6/21	8/15	10/11
Standard Deviation	6 days	5 days	11 days	6 days
Pinot Noir				
Median	4/22	6/23	8/20	10/12
Standard Deviation	10 days	7 days	10 days	8 days
Syrah				
Median	4/28	6/27	8/19	10/18
Standard Deviation	6 days	5 days	7 days	7 days
Tempranillo				
Median	4/21	6/24	8/14	10/14
Standard Deviation	11 days	6 days	6 days	9 days
Trial Varieties				
Grenache Clone 4				
Median	4/18	6/28	8/28	10/19
Standard Deviation	5 days	5 days	10 days	5 days
Malbec Clone 4				
Median	4/21	6/22	8/24	10/17
Standard Deviation	5 days	5 days	8 days	7 days
Pinot Gris 3				
Median	4/23	6/21	8/15	10/9
Standard Deviation	5 days	5 days	9 days	6 days
Pinot Noir Pommard				
Median	4/20	6/21	8/15	10/9
Standard Deviation	5 days	5 days	7 days	11 days
Riesling Wente				
Median	4/25	6/22	8/22	10/28
Standard Deviation	6 days	5 days	9 days	6 days
Syrah Clone 1				
Median	4/27	6/27	8/19	10/18
Standard Deviation	6 days	5 days	7 days	10 days
Tempranillo Clone 1				
Median	4/22	6/25	8/15	10/25
Standard Deviation	10 days	7 days	7 days	8 days
Tempranillo Clone 2				
Median	4/21	6/22	8/14	10/22
Standard Deviation	10 days	7 days	6 days	10 days
Viognier 1				
Median	4/28	6/24	8/30	10/19
Standard Deviation	8 days	4 days	10 days	6 days

June 28th for Grenache. Observations for véraison varied by 16 days with the Tempranillo clones, Pinot Noir, and Pinot Gris the earliest (August 14-15) while Viognier was the latest (August 30th). Harvest dates for the trial varieties come from fewer observations due to the low volume of the crop (some sites did not harvest the fruit), however the numbers indicate that Pinot Noir and Pinot Gris were the earliest (October 9th), while Riesling was the latest (October 28th).

Interval lengths between phenological events (an important measure of vine and berry development timing) show that during 2008 bud break to flowering was 64 days on average; that flowering to véraison was 59 days on average; and that véraison to harvest was 55 days on average (Table 5). The intervals had a 6-10 day variation across both sites and varieties. The overall median bud break to harvest period was 174 days with some varieties requiring as few as 155 days (Tempranillo clone 1), while others needed over 200 days (Grenache).

Table 5 – Umpqua Valley reference vineyard average intervals between phenological dates for 2008.

Interval	*Median*	*Standard Deviation*	*Maximum*	*Minimum*
Bud Break to Flowering	64 days	6 days	77 days	53 days
Flowering to Véraison	59 days	6 days	79 days	53 days
Véraison to Harvest	55 days	10 days	68 days	36 days
Bud Break to Harvest	174 days	11 days	201 days	155 days

Comparison to Previous Years

During the five years of the project bud break has averaged April 11th with a seven day variation across the vintages, sites, and varieties (Table 6). The 2008 growing season experienced a bud break that was later than average, but the same as the delayed bud break in 2006. Bloom has averaged June 12th over the time period with +/- six day variation and 2008 experienced the latest average bloom date over the five years. While véraison has exhibited a relatively large variation across vintages, varieties and sites (9 days), the average dates have been reasonably consistent for the five years of the project, with the exception of 2008 when it was five days later than average (August 14th on average, Table 6). Harvest dates also show large vintage, site, and variety variation (9-12 days) but have occurred on average within the first ten days of October each year, being six days later than average in 2008.

The bud break to flowering interval has ranged from 54 to 76 days during the last five years, with a median of 64 days (the same as 2008) and varying nine days across vintages, sites, and varieties (Table 6). The length of time between flowering and véraison was 59 days in 2008, five days less than the average and has been fairly consistent from year to year. While the véraison to harvest period has varied 10-15 days across sites and varieties, on average it has been 54 days with little variation over the five vintages. The median bud break to harvest period in the Umpqua Valley has been 179 days, varying by +/- 12 days due to site or variety differences, although vintage differences have been as much as 20 days (2008 vs. 2005; Table 6).

Table 6 – Reference vineyard average phenology comparisons for each year of the project.

Region	*2004*	*2005*	*2006*	*2007*	*2008*	*Average*
Bud Break						
Median	4/1	4/2	4/22	4/9	4/22	4/11
Standard Deviation	7 days	11 days	4 days	7 days	8 days	7 days
Flowering						
Median	6/5	6/13	6/14	6/9	6/23	6/12
Standard Deviation	5 days	7 days	5 days	7 days	6 days	6 days
Véraison						
Median	8/13	8/14	8/14	8/12	8/19	8/14
Standard Deviation	7 days	10 days	9 days	9 days	9 days	9 days
Harvest						
Median	10/5	10/10	10/8	10/7	10/15	10/9
Standard Deviation	9 days	12 days	9 days	10 days	9 days	10 days
Bud Break to Flowering						
Median	65 days	76 days	54 days	61 days	64 days	64 days
Standard Deviation	7 days	14 days	6 days	8 days	6 days	8 days
Flowering to Véraison						
Median	68 days	61 days	62 days	63 days	59 days	63 days
Standard Deviation	6 days	8 days	8 days	8 days	6 days	7 days
Véraison to Harvest						
Median	55 days	51 days	51 days	56 days	55 days	54 days
Standard Deviation	11 days	15 days	10 days	11 days	10 days	11 days
Bud Break to Harvest						
Median	185 days	194 days	168 days	175 days	174 days	179 days
Standard Deviation	13 days	13 days	8 days	13 days	11 days	12 days

Composition

Fruit sampling on September 13, 2008 resulted in a "snapshot" of ripening parameters commonly observed by growers and winemakers. A total of 42 samples across all interim and trial varieties were collected and analyzed. °Brix levels averaged 18.2 across all of the samples with the highest °Brix values observed in Tempranillo (clone 1) and Pinot Noir (Pommard) and the lowest in Grenache (Table 7). Titratable acidity averaged 10.8 g/L with the highest values seen for Grenache, Riesling, Viognier, and Syrah while Pinot Noir, Pinot Gris, and Tempranillo (both clones) levels where the lowest. Average sample pH values were 3.01 with the highest values for Tempranillo (clone 1) to low values for Grenache, Riesling, and Syrah. Varietal berry weights (per 100 berries) averaged 135.6 grams with Pinot Noir, Pinot Gris, Riesling, and Viognier having the lowest weights and Tempranillo (both clones) and Grenache the highest weights. Across the varieties, Grenache and Riesling were clearly physiologically behind the other varieties (Table 7).

Harvest composition data submitted by growers or wineries (28-43 observations depending on the variable) indicate an average °Brix of 23.7 with a range of one °Brix over all of the varieties (Table 7). Tempranillo clone 2 and Pinot Gris were the lowest while Pinot Noir and Syrah were the highest. For the 2008 vintage titratable acidity averaged 6.8 g/L with a low of 5.4 g/L for Tempranillo clone 2 to a high of 9.5 g/L for Grenache. Harvest pH numbers averaged 3.42 with a spread of 0.58 from Merlot (3.50) to Grenache (3.17). Harvest yields averaged 2.5 tons per acre across all reference vineyards and all varieties. Lowest average yields were reported for Grenache (~1.0 tons/acre), while highest average yields where seen with Pinot Gris (~3.5-4.0 tons/acre).

Table 7 – Umpqua Valley reference vineyard °Brix, titratable acidity (TA, g/L), pH, and 100 berry weights (g) statistics from the sampling conducted on September 13, 2008 and from harvest numbers submitted. Note that in some cases the values come from small samples and should be considered carefully.

Variety(Clone)	*September 13th Sample*				*Harvest Numbers*			
	°Brix	*TA*	*pH*	*Weight*[1]	*°Brix*	*TA*	*pH*	*Yield*[2]
Average	**18.2**	**10.8**	**3.01**	**135.6**	**23.7**	**6.8**	**3.42**	**2.5**
Interim Varieties								
Merlot	17.8	10.9	2.97	120.7	24.1	7.3	3.50	2.5
Pinot Gris	18.7	8.9	3.00	113.3	23.1	6.5	3.35	4.0
Pinot Noir	18.7	9.7	3.01	109.7	23.7	7.0	3.42	1.8
Syrah	17.6	11.8	2.94	144.5	23.8	5.9	3.44	2.0
Tempranillo	19.3	8.0	3.21	176.0	23.9	6.0	3.48	2.5
Trial Varieties								
Grenache (4)	16.7	14.4	2.82	141.7	24.0	9.5	3.17	1.0
Malbec (4)	18.9	10.9	3.03	130.1	23.4	6.3	3.44	2.6
Pinot Gris (3)	18.7	8.7	3.04	100.7	23.3	5.9	3.38	3.5
Pinot Noir (P)	19.7	8.5	3.08	112.6	24.2	6.5	3.43	2.3
Riesling (W)	18.5	13.2	2.85	97.9	23.8	5.5	3.37	2.4
Syrah (1)	17.7	9.9	2.98	142.5	24.1	5.9	3.44	2.0
Tempranillo (1)	19.5	8.0	3.29	179.3	24.0	8.2	3.49	2.5
Tempranillo (2)	17.2	7.9	3.16	172.6	23.2	5.4	3.47	2.6
Viognier (1)	17.6	10.6	3.04	122.3	24.0	7.1	3.35	3.2

[1] Weight of 100 berries, [2] Tons per acre (however yields not applicable for trial varieties)
Note that the number of vineyards with viable trial vine fruit is only three and that the samples come from the 4th leaf.

Comparison to Previous Years

Composition differences between years have consistently been significantly higher for the sampling than harvest values, indicating the potential for growers to achieve similar composition at harvest across a range of sites (Tables 8 and 9). For the sampling conducted on September 13th, this vintage exhibited the lowest °Brix, highest TA, and lowest pH of the five years (Table 8). °Brix has averaged 19.9 over the five years while TA values from the sampling have averaged 8.3 g/L and pH levels have averaged of 3.06 over the time period. Average 2008 fruit weights where much closer to the study period average than the other parameters with weights varying by roughly 10 grams per 100 berries during the five years, averaging 140.4 g (Table 8).

Table 8 – Comparison of the overall ripening sample values (interim and trial varieties) for the five years of the project.

Parameter	*Ripening Sample*					
	2004	*2005*	*2006*	*2007*	*2008*	*Average*
°Brix	20.2	20.0	20.6	20.6	18.2	19.9
TA (g/L)	7.1	7.9	7.1	8.8	10.8	8.3
pH	3.05	3.06	3.09	3.08	3.01	3.06
Weight (g and t/a)	142.2	136.4	144.0	143.6	135.6	140.4

Contrary to the sampling values above, harvest numbers appear to have reached near normal values compared to the last five years (Table 9). While the five years were different in terms of heat accumulation (Table 3) and phenological timing (Table 6), composition levels appeared to have reached similar values over the time period. The one exception is for °Brix, where the 2007 and 2008 vintages were lower than the previous years. What is interesting is that in 2007 the samples showed fruit that was more ahead than in 2008, but that 2008 ended up very similar due to a better ripening period in late September and into October. The 2008 vintage ended up with average TA and pH values compared to the five years of the study, while yields appear to have been slightly less than the last two vintages but near the five year average.

Table 9 - Comparison of the overall harvest composition values (interim and trial varieties) for the five years of the project.

Parameter	*Harvest Numbers*					
	2004	*2005*	*2006*	*2007*	*2008*	*Average*
°Brix	24.1	24.0	24.4	23.5	23.7	23.9
TA (g/L)	6.6	6.9	6.5	7.1	6.8	6.8
pH	3.50	3.38	3.46	3.33	3.42	3.42
Weight (g and t/a)	1.7	2.4	2.8	2.8	2.5	2.4

Conclusions and Future Issues

The 2008 vintage will be remembered as one of the latest starting vintages of the last 10-15 years in Southern Oregon with bud break occurring generally during the last ten days of April and even into the first few days of May. A very cool spring was followed by an equally wild swing to extreme heat in mid-May then a moderate growing season with few heat spikes and relatively low heat accumulation, punctuated by the earliest and lowest freeze on record in mid-October. Overall the vine phenology started off 2-4 weeks behind with a gradual catching up over the season to near normal late season events. In spite of the cool start and erratic weather, fruit composition in mid-September saw only slightly lower °Brix, higher TA, relatively low pH, and average weights. Furthermore, even after an abrupt end to the season by the extreme cold in mid-October, harvest composition values and yields appear to have reached average levels over the five years of the study.

The fifth year of the project has added to a longitudinal set of climate, phenology, and compositional information for the Umpqua Valley AVA. This is the second year that the initial varieties chosen for the trial plantings have contributed to the information in terms of phenology and composition. These varieties include Tempranillo clone 01, Tempranillo clone 02, Syrah clone 01, Grenache clone 04, Malbec clone 04, and Viognier clone 01. Furthermore fourth leaf data from Pinot Noir (Pommard clone), Pinot Gris (clone 2), and Riesling (Wente clone) are being accumulated as well.

Funding for the 2009 vintage (sixth year) has been obtained and proposals will be submitted for subsequent years with the hope that the project and the potential understanding it can provide will continue. In the meantime, the following items are being addressed and/or planned:

- An overview presentation will be given at an Umpqua Valley Winegrowers Association meeting soon after the first of the year (see email announcements from the association for further details).
- The results will also be used to provide a Southern Oregon component to the Oregon Wine Industry Symposium's "Vintage Overview" February 23-25, 2009 in Eugene.

The first five years of this project have provided seasonal and spatial overviews of climate for the Umpqua Valley AVA. In addition, observations of phenology and composition have helped establish and document the regional and site similarities and differences for the area. The project is intended to be a long-term collaborative effort that better documents and develops a sound understanding of some of the most important factors that influence high quality grape and wine production. As time unfolds the information will provide more insights into the potential and character that are Southern Oregon wines.

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