

2011 GROWING SEASON UPDATE (JULY 5)

By Michelle Moyer, Viticulture Extension Specialist

By many accounts, 2011 has been a challenging year across the state. Patchy, yet severe, cold damage from the “Thanksgiving Freeze” in 2010 has many vineyards starting over, or at significantly reduced yields due to loss of the primary fruiting buds. This was followed by late-spring frost damage in some sites at the end of May. Finally, 2011 is lagging in growing degree day (GDD) accumulation (Table 1). Across the region, we are ranging 243 to 369 GDD units behind 2003, which was considered a warm year. We are ranging 35 to 128 GDD units behind 2010, which was considered a cool year.

Table 1: Growing Degree Day accumulation (base 50°F) from April 1 to July 4, for 2011, 2003 (warm year) and 2010 (cool year). All data was accessed from AgWeatherNet (AWN) (www.weather.wsu.edu).

AVA: Station	2011	2003 “Warm Year”	2010 “Cool-Year”
Puget Sound- Mt. Vernon	345	588	380
Rattlesnake Hills: Outlook	609	963	717
Yakima Valley: WSU-HQ	612	896	678
Lake Chelan: Chelan South	613	n/a	701
Walla Walla Valley: Walla Walla	628	918	689
Snipes Mountain: Port of Sunnyside	629	930	723
Columbia Gorge: Mary Hill	641	n/a	719
Wahluke Slope: Mattawa	708	1072	803
Red Mountain: Benton City	730	1099	822
Horse Heaven Hills: Paterson	738	1052	866

Bloom is slowly coming to an end in Eastern Washington, for both juice and wine grapes. As a historical reference, the average first bloom for Concord is June 1, indicating we are about 3-4 weeks behind “schedule” in most areas.

However, this means very little when speculating on fruit quality and when it will ripen. If you look closely at GDD in Fig. 1, the warm 2003 and cool 2010 growing seasons started similarly, but had drastically different endings. A warm spell in May initially separated the accumulation curves, but the really difference came in mid-July. It truly is the temperatures in July, August and September that can determine a vintage. It is too early to predict how and when grapes will ripen, as we cannot predict with sufficient accuracy how the weather will progress in these critical months.

If we compare 2011 to 2003 and 2010, we can calculate a “best” and “worst”-case scenario. From July 4 to Sept 15, 2003 accumulated 1653 GDD, totaling 2549 GDD; 2010 accumulated 1359 GDD, totaling 2037 GDD. If the current season accumulated the same GDD as in 2003 or 2010, it would place us at 2265 GDD and 1971 GDD by Sept 15, respectfully. In an “average” year, we would accumulate 1395 GDD (based on data from 1924-2010), which would place us at 2007 GDD for 2011. With an average daily accumulation of 14 GDD in September, we could be (at Sept 15) approximately 16 days ahead of 2010 if we have the best-case scenario of warm temperatures, 5 days behind of 2010 if we have the worst-

case scenario of cool temperatures, and 2 days behind 2010 if we have “average” temperatures. These forecasts were based on data from WSU-HQ only.

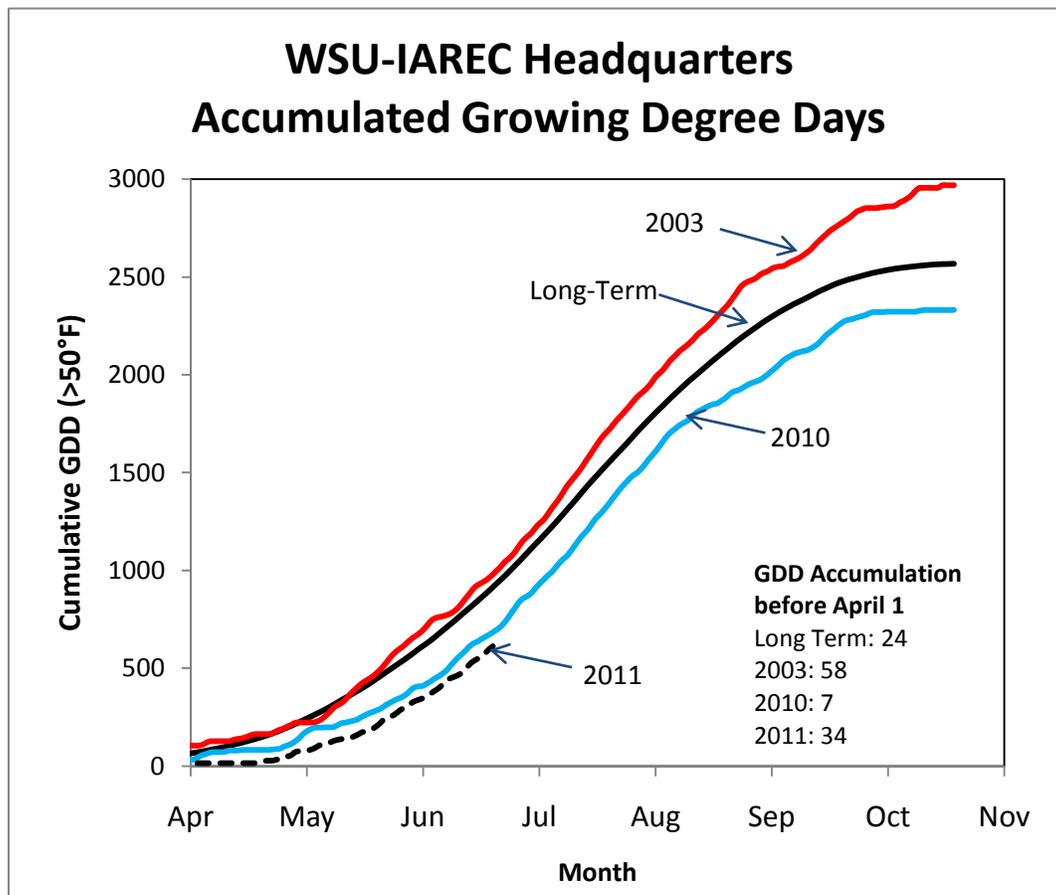


Figure 1- Accumulated growing degree days for the Yakima Valley AVA (WSU-HQ) for comparison reference. Graph updates are available at: www.wine.wsu.edu/research-extension/weather/growing-degree-days/.

Conclusion thus far: Should temperatures stay cool, the vintage may be delayed compared to last year. Even with a delay, we will have enough time to ripen fruit, as climate conditions in Eastern Washington are conducive to reach sufficient sugar content without the presence of unripe flavors. However, with cool vintages, this ripeness may not correspond to traditional harvest parameters vintners in the area are accustomed to, it therefore is important to harvest based on flavor development, not numbers. If cool temperatures persist, winemakers may have to adjust their practices as in 2010 to work with fruit that has more acidity (more malic acid) and lower pH. In 2010, these adjustments were often made by using malolactic fermentation (even in some wines where it was not typically used) and by doing small chemical deacidifications in the must and/or the wine. Information on chemical deacidification and malolactic fermentation is available at <http://wine.wsu.edu/research-extension> under “Articles”. More information on MLF workshops on July 12 and 14 is also available on the website.

Article was prepared with enological input from Dr. Thomas Henick-Kling, Director of Viticulture and Enology, WSU-TriCities.

[Click here to access WSU’s Growing Degree Day page for Viticulture](#)

CALCULATING GROWING DEGREE DAYS

Growing degree day units are automatically calculated for weather stations operated by AgWeatherNet. However, if you have your own station, you can calculate your site-specific GDD. Use the following equation:

$$\text{Growing Degree Day Unit (GDD)} = \frac{(T_{\max} + T_{\min})}{2} - \text{Base(usually 50F)}$$

Example: If the daytime high was 75°F, and the low was 45°F, then GDD for that day would be:

$$\text{Growing Degree Day Unit} = \frac{(75 + 45)}{2} - 50 = \mathbf{10 \text{ GDD}}$$

**Note: GDD units cannot be negative. If you have a negative number, then set its value to 0. For example: If the maximum temperature was 55°F, and the low was 40°F, then:

$$\text{Daily Growing Degree Unit} = \frac{(55 + 40)}{2} - 50 = \mathbf{-2.5 \text{ GDD} = 0 \text{ GDD}}$$

Accumulating GDD for a season is calculated by summing the GDDs from April 1 until October 31.

2011 Vintage Update: 19 July

By Michelle Moyer, Viticulture Extension Specialist, and Gary Grove, Plant Pathologist

Powdery Mildew and Botrytis Updates

Powdery Mildew (PM): Reports have been rolling in from around the state concerning emerging levels of powdery mildew on fruit clusters. The disease symptoms many are seeing now are a result of infections that happened 10+ days ago (perhaps as long as 21 days ago). This season's generally mild temperatures (highs in the 80's, lows in the 50-60's F), along with moderate humidity and cloudy conditions have created perfect conditions for powdery mildew infection and development. If you are seeing disease symptoms now, check your spray records for indications of exaggerated spray intervals earlier in the season (and take note for next year) or application at rates lower than specified on the product label. Slow pre-flowering development kept elongating clusters exposed in a state of susceptibility and extended spray intervals due to cool weather likely created gaps in disease management.

To clean up mildly infected fruit, an eradicant (such as a narrow-range petroleum oil or potassium bicarbonate) combined with a protectant is recommended. The compounds with eradicant activity are contact materials so thorough spray coverage is absolutely essential. Fruit with severe infections will likely not recover with an eradicant spray, as significant damage has already been made to the grapes, predisposing them to future rot problems. Be vigilant with your spray program. Make sure you are using proper rates, are getting good coverage, and making applications at appropriate intervals. Spray coverage and penetration is improved when combined with the viticulture techniques of shoot thinning and fruit-zone leaf removal. If you have a vineyard with significant levels of powdery mildew, avoid using fungicides that are in the high-risk categories for developing resistance. Our most resistant-prone fungicide group is the strobilurin / QoI class (Abound, Flint, Sovran, and Pristine). See our previous announcement regarding appropriate fungicides and their resistance risks:

<http://wine.wsu.edu/research-extension/2011/05/new-fungicides-for-grapevine-powdery-mildew-management-2011/>

Botrytis bunch rot (BBR): We are also still in a critical period *Botrytis* infection (bloom to bunch closure). Those fruit with existing PM infections also have an increased risk of developing BBR after véraison, due to microscopic damages powdery mildew has made to the developing berries. Due to the increased likelihood of a delayed harvest, keep latent *Botrytis* infections in-check now to avoid more significant problems post-véraison. See our previous announcement regarding BBR management:

<http://wine.wsu.edu/research-extension/2011/03/managing-botrytis-bunch-rot-in-2011/>.

With potential for showers during the next several days, and because we are nearing bunch closure (the last opportunity to get fungicide to the inner portions of clusters), using a fungicide with activity against BBR should be considered. A dual purpose fungicide (activity against PM and BBR) such as Inspire Super, Adament, and Pristine will provide protection against both diseases if applied at this stage. However, avoid the use of Adament or Pristine if mildew is already present, as they have a strobilurin component (see precautions above).

Disease Alerts: For those who are not aware, AgAlertz will send disease warnings directly to your phone or email. It is powered by WSU's AgWeatherNet. There are representative monitoring sites in most of

the AVA's, and the daily update of the relative risk of powdery mildew infection is invaluable. Though still in Beta form (forecast data has not been integrated yet), it will likely become a staple in your "Inbox". <http://www.agalertz.com>

We (Gary and I) also do updates and educational blurbs on the Viticulture and Enology Facebook site. For those with smartphones or regular internet access, this might be a good media choice to be connected to in order to receive timely updates. www.facebook.com/WSU.Vit.Enol.Ext

Growing Degree Day Update

The vintage is still holding steady- and behind- last year. Vines are generally through set on the East side, nearing bunch closure in some areas. Vines are into bloom on the West side. Below is the Growing Degree Day (GDD) chart for the Yakima Valley AVA (WSU-HQ at IAREC), highlighting this year, the long term average, and two representative warm (2003) and cool (2010) years. More information regarding specific GDD accumulation for each of the Washington AVAs is located at: <http://wine.wsu.edu/research-extension/weather/growing-degree-days/>

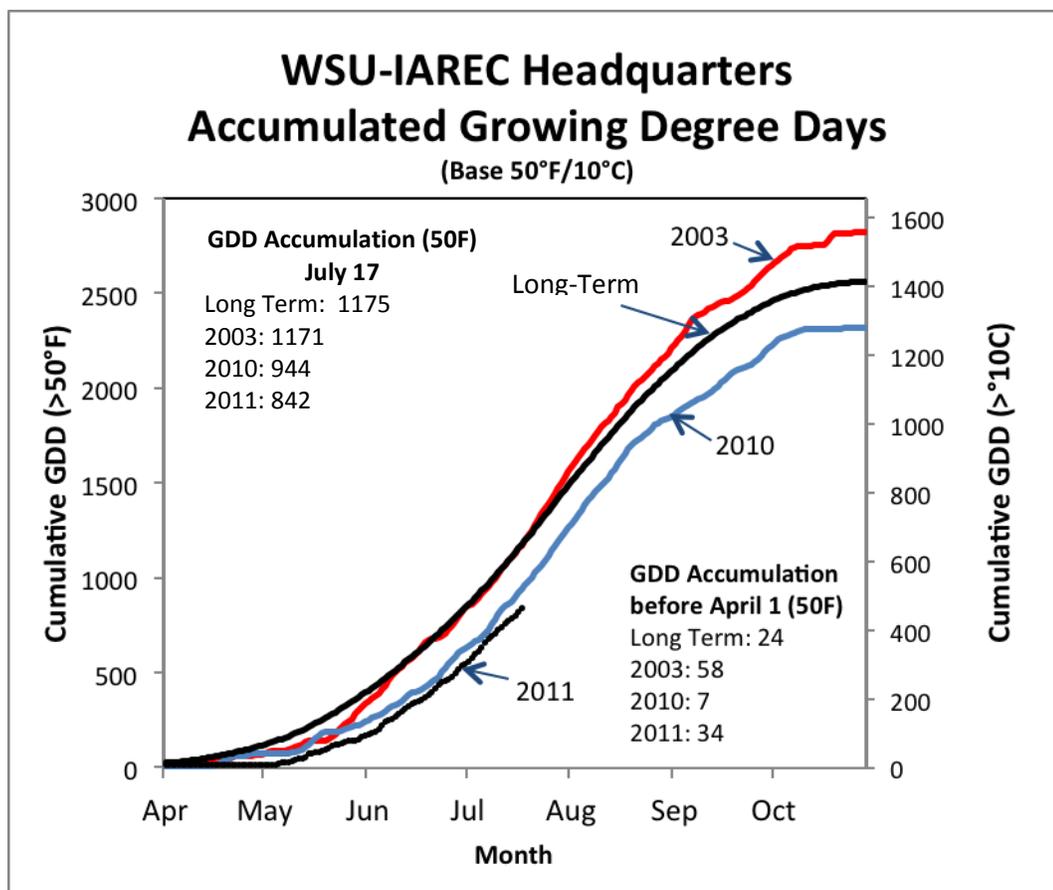


Figure 1- 2011 Growing Degree Day Accumulation for Yakima Valley. Temperature data is from AgWeatherNet at WSU and is sourced from the WSU-HQ weather station located at the Irrigated Agriculture Research and Extension Center in Prosser, WA.

2011 Vintage Update: 2 August

By Michelle Moyer, Viticulture Extension Specialist, and Gary Grove, Plant Pathologist

Powdery Mildew and Botrytis Updates

Powdery Mildew (PM): We are at or nearing the end of cluster susceptibility on the East Side and forecast temperatures are also reaching highs that help to reduce powdery mildew development. At this point, management should be focused on controlling build-up in the canopy. For the West Side, fruit are still in a susceptible stage of development, and management practices should be focused to control cluster infections. Forecast temperatures are still in the optimal range (65-85°F) for rapid disease development. Please see the below paragraph concerning eradication of powdery mildew if a minor loss in control has occurred.

As discussed in the last vintage review, attempts to “clean-up” fruit is really only possible on mild infections. For this, an eradicant (such as a narrow-range petroleum oil at 2% rates, or potassium bicarbonate if available) combined with a protective compound is recommended. The compounds with eradicant activity are contact materials so thorough spray coverage is essential. Fruit with severe infections will likely not recover with an eradicant spray, as significant damage has already been made to the berries, predisposing them to future rot problems. If you have a vineyard with significant levels of powdery mildew, avoid using fungicides in high-risk categories for developing resistance. Our most resistant-prone fungicide group is the strobilurin / QoI class (Abound, Flint, Sovran, and Pristine), the use of which should be avoided if PM is already present in the vineyard. See our previous announcement regarding appropriate use and rotation of fungicides and their resistance risks: <http://wine.wsu.edu/research-extension/2011/05/new-fungicides-for-grapevine-powdery-mildew-management-2011/>

Effective deployment of an eradicant fungicide could require a significant increase in spray volume. As always, spray coverage and penetration is improved when combined with the viticulture techniques of shoot thinning and fruit-zone leaf removal. However, for fruit that is developed beyond set, fruit-zone leaf removal should be approached with caution so as to avoid fruit sunburn.

Botrytis bunch rot (BBR): Forecast temperatures and precipitation for the East Side are unfavorable for BBR infections and we are nearing the end of the first infection window (flowering to bunch closure). This pre-bunch closure time is the last time that fungicide penetration into cluster interiors is possible. In addition, fruit with existing PM infections also have an increased risk of developing BBR after véraison, due to microscopic damages PM has made to the developing berries. Due to the increased likelihood of a delayed harvest, keep latent *Botrytis* infections in-check now to avoid more significant problems post-véraison. If you DO NOT (look closely) have PM in your vineyard, those choices for control include Flint, Pristine, Inspire Super, and Adament at highest labeled rates or tank mixes of Quintec, Procure, Rally, Elite, and others with Elevate, Scala, Vanguard, or Rovral. If PM is present in the vineyard and BBR is a concern, a good choice at this point would be a tank mix of an eradicant and Inspire Super. The ingredients in Inspire Super (difenconazole + cyprodinil) provide forward protection against both diseases and oil or potassium bicarbonate deal with the PM that may already be present.

West Side growers are still in a critical development stage for controlling BBR. Mild temperatures, heavy dew, and high humidity all favor infection. A dual purpose fungicides such as Inspire Super, Adament, and Pristine will provide **protection** against both PM and BBR if applied at this stage at the highest rates. However, avoid the use of Adament or Pristine if PM is already present, as they have a strobilurin component (see precautions above).

Updates and educational blurbs are also available on the Viticulture and Enology Facebook site. The Facebook medium also provides a more interactive approach to information transfer (www.facebook.com/WSU.Vit.Enol.Ext).

Growing Degree Day Update

The vintage is still holding steady- and behind- last year, with WSU-HQ 172 GDD (approximately 8 days) behind 2010, and 393 GDD (approximately 18 days) behind the long-term average. Forecast temperatures for the East Side indicate an average daily accumulation of 23 GDD for the next 10 days, and an average daily accumulation of 13 GDD for the West Side. Below is the Growing Degree Day (GDD) chart for the Yakima Valley AVA (WSU-HQ at IAREC), highlighting this year, the long term average, and two representative warm (2003) and cool (2010) years. More information regarding specific GDD accumulation for each of the Washington AVAs is located at: <http://wine.wsu.edu/research-extension/weather/growing-degree-days/>

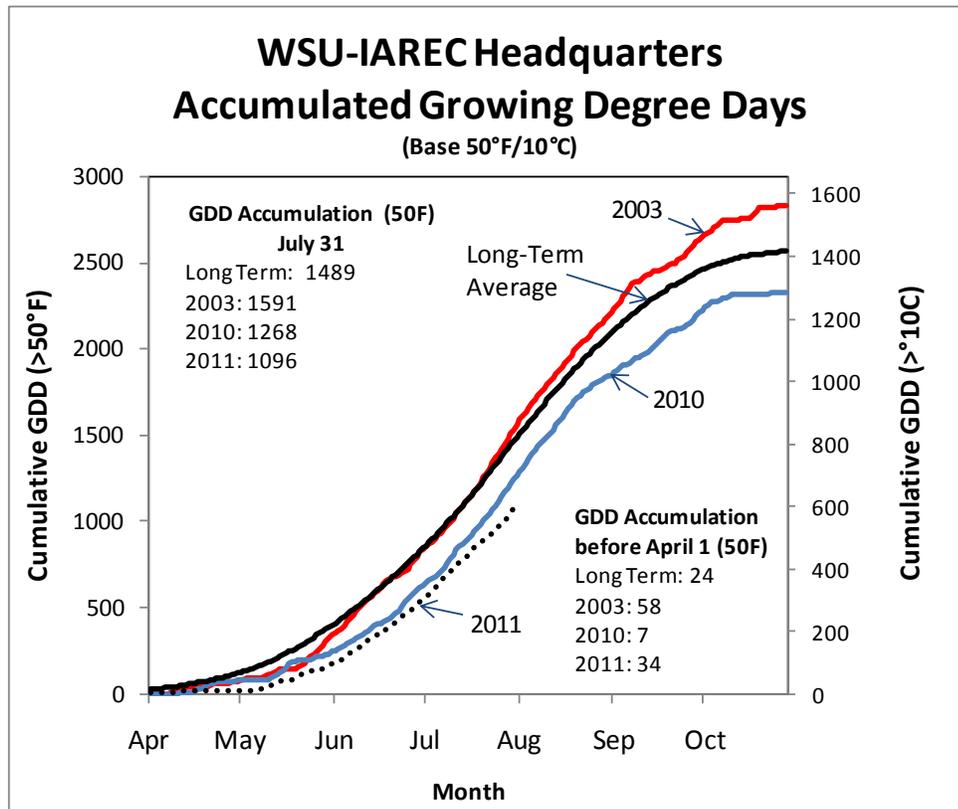


Figure 1- 2011 Growing Degree Day Accumulation for Yakima Valley. Temperature data is from AgWeatherNet at WSU and is sourced from the WSU-HQ weather station located at the Irrigated Agriculture Research and Extension Center in Prosser, WA.

2011 Vintage Update: 23 September

By Michelle Moyer, Viticulture Extension Specialist; and Gary Grove, Plant Pathologist

Powdery Mildew, Botrytis Bunch Rot, Sour Rot

Powdery Mildew (PM): While weather conditions have remained conducive for powdery mildew control, we have passed the period of cluster susceptibility. Mildew management should be focused on controlling canopy outbreaks if/where vegetative growth continues, keeping in mind pre-harvest intervals on some products. For fungicide resistance management, the use of high-risk fungicides at the end of the growing season is not recommended, due to likely high prevalence of the pathogen. (See our previous recommendations on fungicide resistance management: [://wine.wsu.edu/research-extension/2011/05/new-fungicides-for-grapevine-powdery-mildew-management-2011/](http://wine.wsu.edu/research-extension/2011/05/new-fungicides-for-grapevine-powdery-mildew-management-2011/)). Make sure you are still practicing fungicide rotation.

Botrytis Bunch Rot (BBR): As sugar accumulation advances, the likelihood of Botrytis bunch rot also increases. Monitor weather closely, as heavy dew or precipitation events between now and harvest can result in an outbreak. Elevate, Scala, Endura, Rovral, and Vanguard are all appropriate products for véraison to harvest Botrytis control. Copper also has limited efficacy for those practicing organic management.

Also remember, that “extended hang time” also extends the possibility of BBR infections. Be vigilant in BBR management if you are hanging fruit on the vine longer than what is “normal” for your vineyard.

For those who are not aware, a new Extension Factsheet on Botrytis Bunch Rot has recently been published, and is available for free at: [://pubs.wsu.edu/ListItems.aspx?Keyword=fs046e](http://pubs.wsu.edu/ListItems.aspx?Keyword=fs046e).

Sour Rot: Sour rot, called as such due to the “sour” smell of the rotting clusters (often caused by *Acetobacter* and other bacteria, in addition to endogenous yeasts), is differentiated from BBR by its wet appearance. However, BBR and high levels of PM on clusters can lead to sour rot development. Managing sour rot once it is present in the vineyard is challenging, but often compounds applied to control/prevent BBR have limited activity in managing sour rot (e.g. Rovral), especially when applied in combination with copper-based compounds.

Updates and educational blurbs are also available on the Viticulture and Enology Extension Facebook site. The Facebook medium also provides a more interactive approach to information transfer: (www.facebook.com/WSU.Vit.Enol.Ext).

Growing Degree Day Update

Warm temperatures at the end of August and in the beginning of September have caught up GDD accumulation in 2011 with that of 2010. While still behind our historical average, the recent accumulation has been “high quality”, meaning that high temperatures haven’t exceeded the upper threshold at which vines begin to shut down, and low temperatures were not routinely dropping to temperatures that would also slow basic metabolic processes. As a result, many people are seeing véraison, and even harvest, occurring at the same time if not earlier, compared to last year. Reports around the valley are showing that grapes deemed for sparkling production are coming in, and the first lots for Pinot gris and Sauvignon blanc are being picked.

More information regarding specific GDD accumulation for each of the Washington AVAs is located at: [://wine.wsu.edu/research-extension/weather/growing-degree-days/](http://wine.wsu.edu/research-extension/weather/growing-degree-days/)

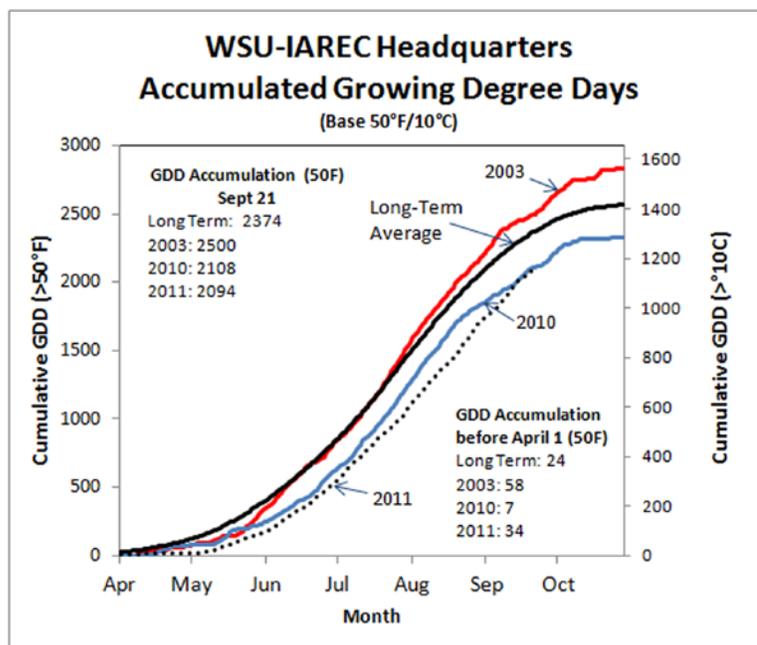


Figure 1- 2011 Growing Degree Day Accumulation for Yakima Valley. Temperature data is from AgWeatherNet at WSU and is sourced from the WSU-HQ weather station located at the Irrigated Agriculture Research and Extension Center in Prosser, WA.

VINTAGE UPDATE: 30-SEPT 2011

This update is a compilation of a series of emails sent the 29 and 30 Sept 2011 regarding the 2011 vintage.

Disease Update- Botrytis Bunch Rot Alert

By Gary Grove and Michelle Moyer

First, the good news: Gerrit Hoogenboom and the AgWeatherNet team have posted a preliminary version of the Broome Botrytis Bunch Rot model on the AWN web site (<http://weather.wsu.edu>). Once you are logged in, click on "AWN Models" in the vertical blue menubar and then "Grape Bunch Rot". Users will need to select station locations and date span (we suggest bloom through the current day) and then bloom date again. As we are in the midst of Botrytis season there is little time for formal training so we have attached a sample model output from AWN. The "Site Summary" output includes the bloom date (entered by client), last date of moderate to high infection risk, a choice to look at season-long conditions, and a risk index graph. Available but not shown is also a table of some fungicides registered for bunch rot management. Unfortunately, at this time we know little of the postinfective activity of these compounds so we cannot recommend treatment in response to an infection event; the best approach is to apply these compounds protectively BEFORE an infection event. Given the news below, it might be a busy several days ahead.

Now the bad news: Hopefully you've all seen the weather forecast for the following 10 days. The forecasts are that conditions very favorable for the development of bunch rot:

116 PM PDT WED SEP 28 2011

...COOL AND WET WEATHER NEXT WEEK FOR WASHINGTON AND OREGON...

THE WEATHER WILL BE CHANGING EARLY NEXT WEEK TO A COOLER AND WETTER PATTERN. A SERIES OF FRONTS WILL BE MOVING ACROSS THE REGION WITH PERIODS OF RAIN. THE FIRST SYSTEM WILL BE MOVING THROUGH ON MONDAY WITH A STRONGER ONE TUESDAY INTO WEDNESDAY. RAINFALL AMOUNTS THROUGH WEDNESDAY COULD BE UP TO ONE INCH AT THE LOWER ELEVATIONS...WITH 1 TO 2 INCHES IN THE MOUNTAINS. HIGH TEMPERATURES WILL BE IN THE 50S AND 60S WITH OVERNIGHT LOWS IN THE 30S AND 40S. SOME SNOW IS POSSIBLE IN THE HIGHER MOUNTAINS.

We will be updating this information regularly on the WSU Viticulture and Enology Facebook page.

Best wishes and good luck!

Enology Notes - Grape Ripening

By Thomas Henick-Kling and Jim Harbertson

Grape flavor and acidity

The wonderful ripening weather we have had has allowed some very nice flavors to develop in most white grapes and in several reds. It appears that we are ahead of 2010 in terms of flavor ripeness and we also have lower acidity in many vineyards. In many white grapes the titratable acidity is already below 10 g/L and the pH above 3.0. These are acid ranges that can very easily be managed with malolactic fermentation and perhaps a small chemical deacidification – lowering final TA by perhaps 0.5 or 1 g/L. If you see larger deacidifications needed then it is better to do this in the juice prior to fermentation. For help with deacidification, please refer to our newsletter last October: <http://wine.wsu.edu/research-extension/2010/10/managing-high-acidity-in-grape-must-and-wine/>

Chaptalization

It seems though that acid management will not be a problem this year – or an easy one to handle. Unfortunately our soluble solids is still lagging behind. Yet, this is not a problem, sugar adjustments are easily made (best with neutral tasting cane sugar). When chaptalizing, it is not a good idea (and in some cases illegal) to increase the natural alcohol content by more than

2% (v/v). Remember that 20 Brix equals 20g/100 g of liquid, or 200g/L. To chaptalize from 20 Brix to 22 Brix you would add 20 g of sugar per liter of must. When chaptalizing, remember to first solubilize the sugar first in must or water and allow space in your fermentation tank for the increase in volume. A good practice is to make a 200 Brix (2000 g/L) solution and add this solution back to increase the fermentable sugar content. At 59°F you can dissolve up to 1.97 kg of dry sugar in 1 liter of water or wine. At 86°F you can dissolve up to 2.19 kg sugar per liter. Remember to add the sugar under constant stirring, making sure it is all dissolved before adding the sugar solution to the must.

Botrytis bunch rot threat

Remember also that if you are going to use a fungicide that yeast are actually fungi, so following preharvest intervals are not only a legal requirement, but also a good idea for a healthy fermentation. Clarify white musts well, as it will help to remove any spray residue. Should you run into fermentation difficulty and you suspect spray residue as a cause, try using yeast hulls. The yeast hulls (cell walls and membranes) bind a range of inhibitors such as fungicides (copper included).

Always remember to add yeast nutrients! Aim for 250 mg/L Yeast Available Nitrogen.