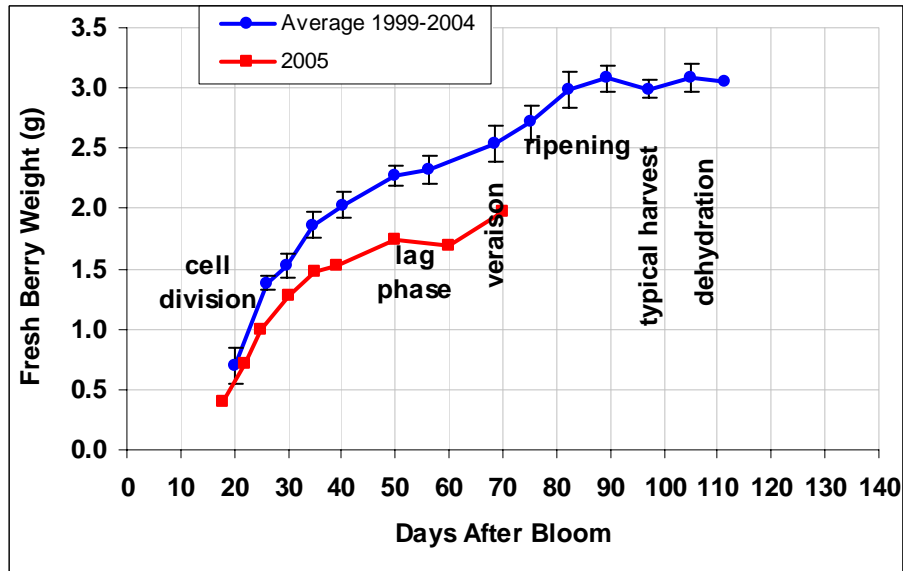


Concord Veraison Update
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Veraison Berry Weight:



Berry weight from 120 node (unthinned) Concord vines at the Fredonia Vineyard Laboratory.

The 2005 berry curve shows the effect of the dry growing season on Concord berry weight. Official veraison at the lab was 8/21/05, exactly 69 days after official bloom. You may recall from earlier fruit development discussions that average Concord veraison occurs 69 days after bloom +/- 3 days. Water stress typically causes the vines to hit veraison a little early so I would have hedged my bets toward the minus 3 days but the official word falls right on the 69 day average.

Sometimes it pays to play the averages. Rich Erdle of National Grape Co-op asked me to look at the effect of Lake Erie spring water temperature or heat accumulation on Concord bloom date in Fredonia. Since the water temperature is buffered more than air temperature, it turns out that the accumulation of heat in Lake Erie can be a better predictor for Concord bloom than air GDD. Could this possibly be a specialized characteristic of the Lake Erie terroir?!?!? Based on my analysis on May 1st, I made some weatherman type predictions for 2005 Concord season. In an email I sent to Rich Erdle on May 3, 2005 it was stated. . .

“According to Lake Erie temperature (or Lake GDD accumulation) from April 1 to May 1, the lake has accumulated 229.7 units. According to the regression analysis I gave you two months ago, there is a 60% chance that the 2005 bloom will be on 6/13 (3 days ahead of average for the Fredonia vineyard lab). Therefore, veraison will be 69 days later on 8/21 and harvest will start on 9/21. Ahhh! The Great Swami has read the stars and dropped the virgin cow utter into

the depths of Lake Erie to predict another fruitful Concord season. Now we must wait to realize the truth in his words!!!!”

OK, the second part of the message was in jest based on my confidence (or lack of confidence) that the 2005 season would follow the average numbers. Although there are many seasonal/environmental factors that can influence the “average” numbers, it appears that the Concord crop is developing “normally” in 2005.

Veraison Juice Soluble Solids:

On average, Concord juice soluble solids are between 7.0 and 7.5 brix at veraison. This year, the veraison brix averaged 9.3!!! What could possibly be going on? Why is the veraison brix reading so high? The answer is in the fact that juice soluble solids (degrees brix) is a measurement of concentration. If you dream back to your youthful days in high school chemistry, you will remember an equation:

$$C1 \times V1 = C2 \times V2$$

Meaning - the concentration of a substance multiplied by the volume it is in is equal to the concentration of the substance multiplied by the volume you change it to. Sound confusing? Not really. The processors use it all the time when concentrating juice from 16 to 64 brix by getting rid of water and changing the volume. Lets look at our berry weight situation for 2005.

C1 = juice soluble solids at veraison in 2005 = 9.3

V1 = average veraison berry weight in 2005 = 1.98 g

V2 = long term average veraison berry weight = 2.5 g

$$C1 \times V1 = C2 \times V2$$

$$9.3 \times 1.98 = C2 \times 2.5$$

$$18.41 = C2 \times 2.5$$

$$18.41 / 2.5 = C2$$

$$7.36 = C2$$

Therefore, if we had normal size berries in 2005, the veraison juice soluble solids would be 7.36 brix (well within the normal 7.0-7.5 brix). The small berry weight in 2005 is simply concentrating the sugars made from photosynthesis causing the veraison juice soluble solids to read high.

Harvest Predictions:

The averages seem to be working for us so far in 2005 so let's stick with them. Looking at historical data, I classify early, mid, and late Concord seasons based on when the fruit hits 10 brix (you could also use veraison date). In early years, the fruit hits 10 brix before 8/28, mid years it hits between 8/28 and 9/4, late years hit 10 brix after 9/4. Therefore, I would classify 2005 as an early ripening year because we will hit 10 brix before the end of this week.

What do the averages tell us about an early ripening season? The averages say that Concord fruit will increase from 10 brix to 16 brix in 28 days +/- 4 days (24 to 32 days) based on . . .crop load, sunlight exposure, canopy function, and berry weight (remember, juice soluble solids is a measurement of concentration).

For example, if you have a relatively dry block with a light crop and the canopy is in reasonably good condition, you can expect 16 brix approximately 24 days after 10 brix. A relatively wet block with a large crop might hang on for the entire 32 days. Furthermore, a vineyard with a dysfunctional canopy because of excessive dry conditions, mineral nutrient deficiency, or insect damage may take longer to ripen – big surprise there. Lastly, since berry weight is almost entirely dependent on water weight gain from veraison to harvest, vine water status will have a lot to do with sugar concentration. Dry weather will lead to low berry weight and high brix. A hurricane will increase berry weight and decrease sugar concentration ($C_1 \times V_1 = C_2 \times V_2$).