2005 Hang Time Evaluation
UC Cooperative Extension, Sonoma County

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Three Sonoma County vineyard managers participated in a study in 2005 to assess the effect of harvest date on yield and maturity parameters in Merlot. All three vineyards were located in the Alexander Valley and varied in clone, rootstock, vine age and planting density (Table 1). Vines in Vineyards #1 and #2 were trained as spur pruned bilateral cordons and rows were oriented East-West. Vineyard #3 had a North-South orientation and vines were trained as unilateral, spur pruned cordons.

In early September at each site, 28 data vines were selected in two adjacent rows. Selected vines appeared to be uniform in vine size and crop load within a site. Cooperators had previously completed all crop thinning and other canopy management practices. Seven weekly harvests of four data vines began at each vineyard on 13 September when sugar maturity ranged from 22-23 ºBrix and ended 25 October. Clusters were counted and crop weights found for each vine. Fruit from each vine was crushed separately and the juice was analyzed for ºBrix, pH and titratable acidity by vine. Leaf water potential (LWP) was found on data vines the day prior to each harvest date. The vineyard managers determined the irrigation schedule and volumes applied. No water was applied within 48 hours prior to weekly LWP measurements.

An attempt was made to select data vines within each site that had the same crop levels, however that goal was not met. To adjust for this, some harvest data were not used to make weekly comparisons of calculated yield per acre. Within a vineyard, yield comparisons over time were made only when average cluster number per vine was very similar. As a result, Vineyard #2 was excluded from tonnage comparisons. Yield change was determined between consecutive harvest dates for Vineyards #1 and #3 with average cluster numbers of 38 to 40 and 24 to 26 respectively (Table 2).

When average cluster number per vine is nearly the same, then changes in yield can, for the most part, be attributed to changes in cluster weight. Calculated tonnage did not consistently decrease over time. The weekly decrease in yield per acre (calculated from average yield per vine and plant density) ranged from 3.9% to 11.5% in Vineyard #1 and from 0.7% to 11.1% in Vineyard #3 (Table 2). In Vineyard #1 average yield per acre increased 14% between the final two harvest weeks.

It is not immediately evident that irrigation frequency and volume of applied water affected cluster weights (Figure 1), however average Brix of must from data vines was responsive to applied water (Figure 2). In general Brix increased when water was withheld and decreased after a significant amount of water was applied. In Vineyard #1, Brix peaked at 26.6 ºB at Week 3 harvest (27 September) when the vineyard did not receive irrigation and fell after an overhead sprinkler irrigation. Brix tracked applied water in Vineyard #2 in a similar manner. Vineyard #3 received 6 gallons of water per week throughout nearly the entire harvest period and Brix continued to climb at nearly the same rate from Week 1 harvest (13 September) through Week 5 harvest (11 October) then leveled to 28.3 °B on the final harvest date.

The lowest (most stressed) average mid day LWP in Vineyard #2 and #3 occurred the day prior to Week 6 harvest (17 Oct) with -12.6 and -12.7 bars respectively. On that date, LWP of data vines in Vineyard #1 averaged -9.9 bars. The lowest LWP for Vineyard #1 occurred the day prior to Week 2 harvest (19 September) with -10.9 bars.

Summary

The variability in crop load per vine prevented a clear trend from developing in yield change over time. Even when vines with dissimilar cluster number were excluded from the analysis, change in calculated yield per acre over time was not consistent within a site. This was also true with cluster weights. Although weight loss was most common, average cluster weight increased on the last two harvest dates for Vineyard #3 and the final harvest date for Vineyard #1 (Table 2).

For this project to clearly demonstrate the effect of extended harvest on yield, cluster number of all data vines would have to be held constant. That would require data vines be pruned and cluster thinned to achieve identical cluster number. Vine to vine variability in sugar accumulation is common regardless of crop load, thus to accurately assess impact of harvest date on maturity, Brix measurements must be taken on fruit sampled from a large population of vines and not very few vines as in this project.

This project was conducted in a year characterized by lower than “normal” temperatures in September and October. When daily temperatures in those months are compared over the last two years at various sites within the Alexander Valley, there were 0 to 4 days in 2005 in which daily maximum temperatures were at or higher than 95 °F and 12 or more days in 2004. Also, there were no prolonged periods of low relative humidity or high vapor pressure deficits in 2005. LWP measurements indicated that data vines were never under severe water stress over the seven week harvest period. A mid day vine LWP of -10 bars represents no water stress and -13 bars only moderate water stress.

Temperature and other weather-related parameters may affect crop weight during an extended harvest period either alone or in combination with farming practices, such as irrigation, that are responsive to weather. How much those factors affect crop weight at that time is not known.

Cooperators: Four Alexander Valley vineyard managers and Nick Frey, Executive Director, Sonoma County Grape Growers Association.

Figure 1. Change in Cluster Weight week to week as compared to Applied Water

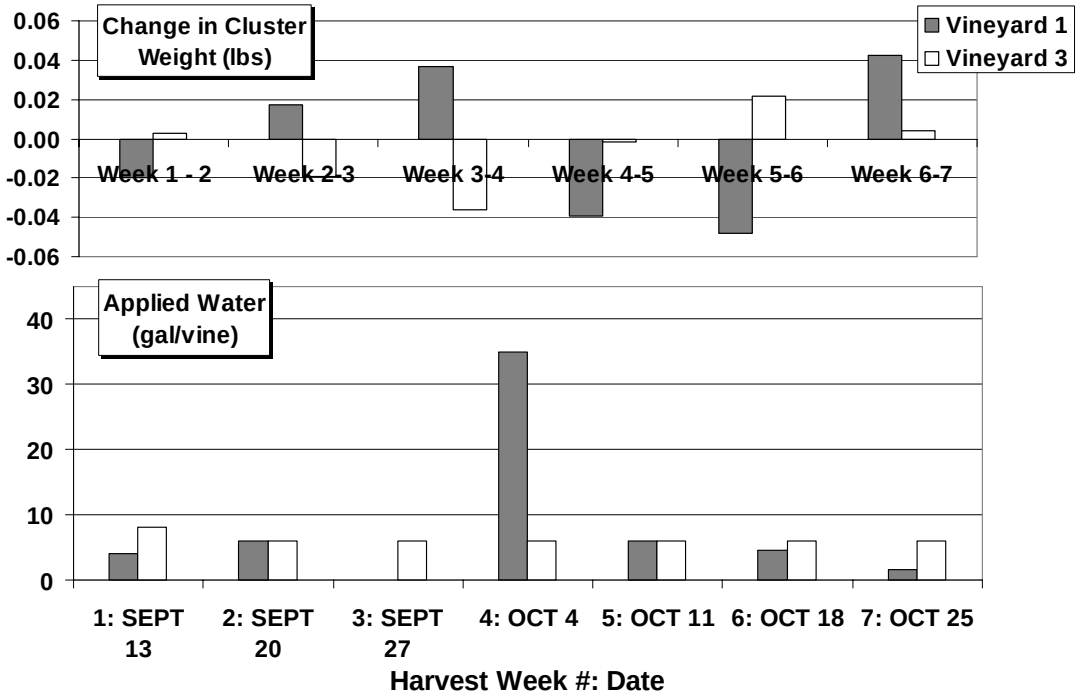

Figure 1. Change in cluster weight is the difference in average cluster weight for four vines between consecutive weeks. Applied water is the total number of gallons per vine applied in the seven day period prior to the harvest date.

Figure 2. ^{o}Brix of must samples and Applied water

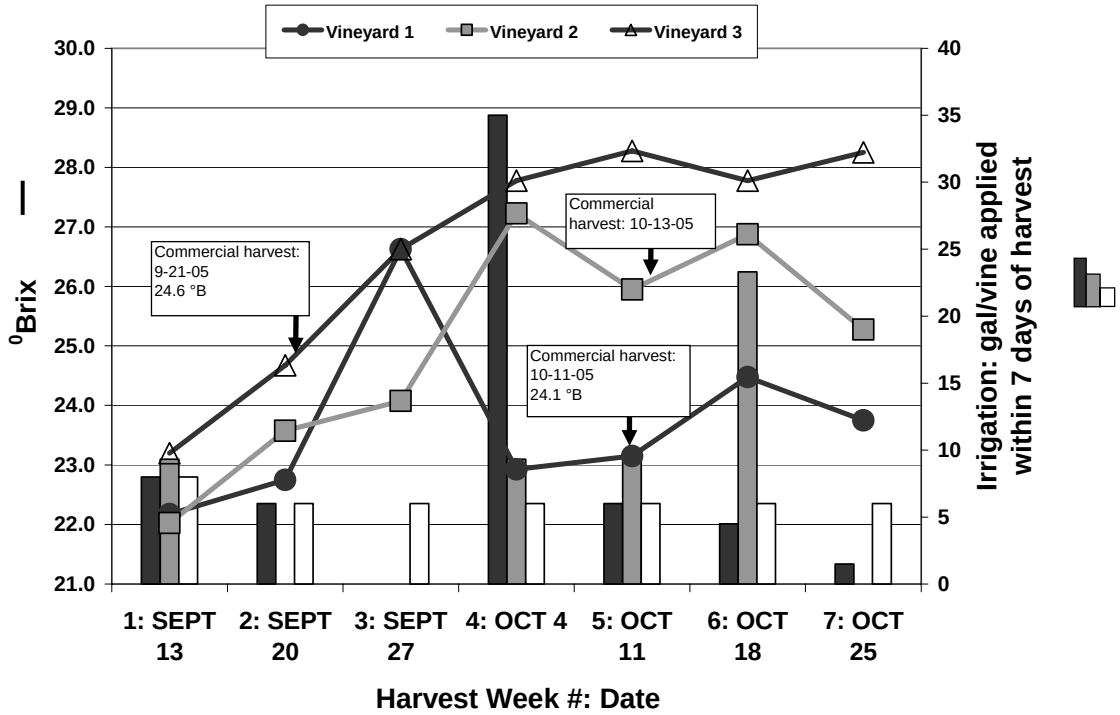

Table 1. Merlot site descriptions – extended harvest evaluation -Alexander Valley 2005

Vineyard	Clone	Rootstock	Spacing (ft)	Trellis	Year Planted
1	FPS 06	101-14	5.3 x 9.5	VSP	1999
2	FPS 02	5C	7 x 9.6	VSP	1992
3	314	101-14	5 x 6	VSP	1996

Table 2. Percent change in cluster weight and yield per acre

Vineyard #		Week 1-2	Week 2-3	Week 3-4	Week 4-5	Week 5-6	Week 6-7
Vineyard #1	Cluster wt.	-6.4	+6.0	+12.0	-11.5	-15.9	+16.8
	Yield per acre	-3.9	----------	----------	-11.5	-9.6	+14.0
Vineyard #3	Cluster wt.	+0.9	-5.9	-11.9	-0.7	+8.0	+1.4
	Yield per acre	+2.3	-11.1	-4.7	-0.7	----------	----------

Table 2. Average cluster number per vine in Vineyards #1 and #3 ranged from 38 to 40 and from 24 to 26 respectively for all weeks that yield per acre data are compared. Vineyard #1 (866 v/ac) had 5.1 tons/Ac (calculated from per vine yield and plant density) in Week 7 and Vineyard #3 (1350 v/ac) had 4.7 tons/Ac in Week 5.