

grape growing

In Viticulture, Timing is Everything

Procrastination is a vice in viticulture

Mark Greenspan

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THIS GROWING SEASON HAS been flying by faster than I can keep up. Same for you? In fact, I've had such a difficult time keeping up with my work that I've chosen a rather general topic to write about: keeping up. Getting things done on time is just about the most important factor in good vineyard management. That seems a rather broad statement; but if you consider all of the major vineyard operations, proper timing is essential for optimal productivity, quality and cost-efficiency. Let's consider most of the common operations.

Pruning

I've seen vines pruned right after harvest in November, the goal of growers being to finish up early so they could leave on an extended vacation. I can't argue against taking some quality time off to enjoy life but is this the best thing for the vines? Timing of pruning is largely dependent on weather and availability of labor (for hand pruning at least). But early pruning in wet winter climates exposes the vines to greater risk of infection by wood canker diseases (e.g., Bot Canker and Eutypa). Pruning late tends to reduce this risk while also delaying budbreak. Delaying budbreak can be advantageous for a frost event dodge. But pruning late can also shift the entire season later in time. This can be an advantage in regions where it is desirable to push the ripening period into a cooler part of the season but can also be problematic where the season ends abruptly with cold, wet weather or early frosts. My score of the impact on pruning timing on viticulture (1 to 10 scale) is 9. (My scores are just for fun.)

Fungicide Sprays

This one shouldn't take too much convincing. But since spray applications are a repeating practice, they cannot be pinned down to a time of year or specific phenological event. Well, at least with regard to powdery mildew sprays, which start shortly after budbreak and last through veraison. For those, it's more a matter of interval between sprays rather than coordinating with a particular phenological event. But Botrytis spray timing is very important. The first application of a Botrytis protectant should be at fruit set when latent infections can occur. A second application is required prior to

berry touch or bunch closure. Getting the spray on, after the bunches tighten up will greatly reduce the effectiveness of a protection spray. Spraying after infection is seen as almost always too late. I'm not familiar with the molds and other stuff that humid-region viticulture has to deal with, but I'm sure that timing is just as important as it is with something like Botrytis. My impact score is a 9 (I'd go with 9.5, but then you'd probably roll your eyes).

Suckering and Shoot-thinning

The timing of trunk- and head-suckering (not including shoot-thinning) is of modest importance. Suckering passes will usually comprise of more than one pass through a vineyard. Delayed suckering can impact shoot growth of the remaining shoots but usually not to a major degree, unless there are a lot of suckers. On the other hand, delayed suckering can make suckering more difficult. As suckers get intertwined with other shoots or suckers become more strongly attached to the permanent structure, the process of suckering can be more time consuming and, therefore, more costly. I'll give that a timing impact score of 4.

Shoot-thinning, on the other hand, can be used as a management tool, so it is quite different than suckering. Early shoot-thinning (say, at only 4" of growth) not only makes it easier to perform, but also quickly reduces the number of growing points on the vine without greatly sapping the vine of carbohydrate reserves. So, early suckering can be used to help stimulate weak vine growth and even up shoot growth in vines that tend to be uneven. On the other hand, delayed shoot-thinning can reduce shoot vigor and help to devitalize vines that tend to be overly so. We've done differential timing of shoot-thinning in variable vineyards and have seen success in making the block vigor more uniform. I'll assign the shoot-thinning impact a score of 8.

Shoot-positioning

Shoot-positioning became a part of our vineyard plans when VSP and other systems came about that required us to tuck and lift shoots within pairs of moveable wires. This essential part of canopy management was not as important when our vineyards were mostly sprawled. We now expect our vineyards to be lifted and tucked several times during the grand period of

growth. The timing of this is important. Waiting too long to move wires and shoots makes the process more difficult, slow and expensive. Tendrils intertwine with shoots and make them difficult to separate. Delayed shoot-positioning also creates shade on the inflorescences and clusters, affecting spray penetration and increasing the risk of powdery mildew and Botrytis. This can be a severe impact on quality if it gets out of hand, so timely shoot-positioning is more than a nuisance—it has real impact and not in a positive way. I see some vineyards that are allowed to go wild and then, in a single pass, are positioned and trimmed and, voilà—a clean, managed vineyard. I don't think that the single pass canopy management is equivalent to the multi-pass, timely and methodical canopy management, but I also realize that vineyards are managed to varying economic realities. My impact score: 7.

Leaf and Lateral Removal

Fruit zone leaf and lateral removal is an optional practice. It was more impactful and necessary when sprawl canopies were the norm but has become commonplace even in VSP systems. I was flabbergasted about 15 years ago when winemakers asked growers to strip leaves on both sides of the canopy, leaving fruit to hang out in sunlight with no protection. This can work in some of the coolest climates but has led to sun damage in climates that experience periodic heat events. Nevertheless, and regardless

of the severity of leaf and lateral pulling, the timing of the removal is of high importance. The optimal timing is right at fruit set or even slightly before—not two weeks after and certainly not more than that. For pyrazine varieties (namely Cabernet Sauvignon), reduction of pyrazine accumulation can be mitigated by early leaf removal. Delaying this will only increase the pyrazine level at veraison, with the accompanying delay in degradation throughout ripening. But for all varieties, early leaf and lateral removal allows fruit to acclimate to the higher sunlight conditions, making them much less prone to sun damage than if the procedure is delayed by even a couple of weeks.

This is not easy as hand leaf and lateral removal are slow and time consuming. Some have moved toward machine leaf removal, and current machines do an excellent job of it, if not sometimes tending to overdo the amount of leaves removed. I would rather see the machine leaf removal happen than to delay leaf removal for weeks. My impact score: 8.

Crop-thinning

Crop adjustment is something that occurs in almost all vineyards. Like shoot-positioning, the ideal number of passes likely differs from the actual based on the economic model of the vineyard. I will consider two thinning passes for this discussion. The first pass is made during the lag phase, and it is probably the most impactful of the thinning passes. The objective of this



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Terravant Wine company purchases close to 1,000 Oenotank maturation tanks to replace older barrels in the cellar. We asked key Terravant personnel the reasons for such a large move from barrels to the Oenotank program:

"The Oenotanks are really helping to get a nice, palatable wine to market that much sooner."

General Manager Randy Pace

"The maintenance of Oenotank is very low. We have already started trials of some very high-end, expensive wines into Oenotanks. I am achieving the same qualitative maturation of the wine. The idea that we can have a 5 barrel lot of wine is one of the real attractive parts."



Winemakers Travis Proctor & Anna J. Clifford

"All the tastings have been positive. The cellar master tells us we have not had to top them off - positive time-saving stuff." Terravant has a number of tier 1 & 2 wines maturing in Oenotanks, but they also have the highest level (tier 5) in them too. Mention was made

of a vineyard designated Pinot Noir from the Santa Rita Hills appellation that is being matured 20% in new barrels and 80% in Oenotank, with the intention to bring both elements together once maturation is complete.



Cellar Master Dean Guzman

"Oenotank has been great from a quality & efficiency standpoint - we have been coming through bi-monthly and just making simple sulfur additions. We haven't seen any ullage or film being created on the surface, not to mention the wines are coming out great - they are well rounded. The Oenotanks are really helping to get a nice palatable wine to market that much sooner."



Terravant Wine Company, based in Buellton, Santa Barbara County, provides custom services including private labeling & custom design, shiner sales, bulk wines, custom crush & AP. Terravant selected Oenotank, made by Australian pioneer & market leader Flextank International Ltd (not to be confused with a similarly named USA company), after extensive research into available alternatives. Terravant has the capacity to mature 288,000 gallons of wine in the nearly 1,000 Oenotanks



purchased. Terravant also has on trial French oak staves & chips "Esprit du Chêne," specifically launched for use with the Oenotank. Staves are made to the same standard as premium barrels, being from 150 to 175 year-old oak trees mostly from the "center" region of France. The goal is an authentic simulation of oak barrel maturation, in combination with the passive oxygenation naturally delivered through the Oenotank wall. The picture to the left shows stacked Oenotanks full of maturing wine. OakTree Trading of Santa Barbara provided an innovative financing option for the Oenotank purchase.

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pass, in my opinion, is to break up clumps of fruit, remove wings and shoulders and create an open microclimate for each cluster. Stacks of clusters will cause uneven development and ripening of fruit and will be detrimental to wine quality, regardless of the target program. I've asked the question before about actual crop load effects on quality, outside of the distribution of fruit in the fruit zone. I do believe that there is some relationship between the actual crop load and quality, and that is hormonally mediated. That said, the timing of this pass is very important, and it should be completed around the lag phase. Thinning earlier is certainly easier, but early thinning can cause enlarged berries. Thinning later than about two weeks before veraison will decrease the positive benefit of this thinning pass. Get this one dialed in if at all possible. My impact score for the lag phase thinning: 9.

The second thinning pass is usually late in the veraison phase. Removing clusters that are mostly green (or not into veraison, more generically) will improve uniformity of ripening, despite some claims that they all catch up, which is not true from a sensory standpoint. The timing of this pass depends, again, on economics. Higher-end wine growers will perform this "green drop" when veraison is 75 to 80 percent complete while production-oriented growers will perform it when veraison is closer to 90 percent complete, which will result in less crop being dropped. The green drop step is less critical than the lag phase thinning pass, so I'll score its impact at 7.

Irrigation and Water Stress

This one is such a big and diverse topic that I'll only lightly touch on it here. Irrigation practices depend on the climate where the fruit is being grown and definitely also upon the economics of the operation. Speaking again from the standpoint of what is ideal, it is important to provide the vineyard with sufficient moisture during the vegetative growth phase and through fruit set, such that the canopy is allowed to develop and fruit set is not hampered. But after fruit set, it is important not to provide excessive moisture to the vines as berry growth will proceed happily with ample moisture, and we generally do not want big berries for high-end winemaking (yes, I realize that large berries will also increase yield, so for some operations, small berries are not desirable). Dialing back on the water status (i.e., making the vines more stressed) will have positive effects on wine quality when applied between set and veraison, and my timing target to achieve our stress target is about two weeks prior to veraison when the ripening process actually starts on a molecular (DNA and RNA) and biochemical level. This timing is very important for all fine winegrapes but especially for red varieties, as the ripening process is positively affected by stresses that occur before veraison. Stress after veraison is also important, but to a lesser extent, and our goals after veraison are on the retention of leaves and prevention of fruit shrivel. So water status may be higher after veraison with little detriment to quality. Irrigation and water management are my "thing," so you might expect a 10 for this one, but I'll score this one at a 9.



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Nutrient Management

Like water management, nutrient management is a complex practice, so I cannot easily simplify it without losing its core principles. However, the vine takes up nutrients and uses them differentially throughout the growing season. I recently wrote about nitrogen management¹ and micronutrient management² in *WBM*, so you should turn to those articles for more detail. I also would add that timing of potassium (K) applications is important as the vine needs K early in the season and throughout the rest of the season. But application of K after veraison can lead to problems with high must K and possible subsequent issues with high wine pH. So, timing of the K applications to avoid late-season deficiency (and possible retardation of sugar accumulation) is important because we need to get the level up to adequate by veraison, after which we do not want to apply any more K. Mineral nutrition should be looked at mineral by mineral, so discussing the timing of nutrient management as a whole is not very informative, but I'll assign it a score of 8.

Harvest

This one probably needs no discussion, and I'll give it the coveted 10 score. All the efforts in the world, including getting the timing correct in all of the above categories, are meaningless if we get the harvest timing incorrect. It's our best (and in many cases the only) time growers and winemakers/wineries come to a decision that is supposed to be mutually beneficial, but it never seems to go that way. Picking too soon can and probably will reduce the wine flavor (including taste, aromatics and mouthfeel) below its potential for that particular vineyard. All that work for a mediocre wine. Picking too late may cause excessive shrivel, reducing yield (and revenue) to the grower and creating flavors that tend toward the over-ripe qualities, while possibly also reducing acidity to the point of needing correction. All winemakers have their own idea of what is ripe and what is not, and few winemakers in the fine wine world pick on fruit chemistry alone. Tasting of fruit, ideally throughout the block and not just two vines in from the roadway, is the current common practice in fine wine and is also practiced in the more value-oriented sectors. Whatever the case, harvest is the make-or-break point of the entire growing season and, because of logistics, emotions and fear, is probably the point at which most mistakes are made.

I know I didn't give many low scores, but I suppose if they were to get such a low score, I wouldn't need to have mentioned them in this article in the first place! *WBM*

References

¹ Slow and Steady Nitrogen Management in the Vineyard, *Wine Business Monthly*, May 2014.

² Micronutrients: You Should Sweat the Small Stuff, *Wine Business Monthly*, June 2014.

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