Post Harvest Vine Care

Winter injury has been a factor in vineyards in the East for two of the past three years. After eight relatively mild winters a harsh reminder of the hazards of grape culture in our continental climate appeared in 2003. In southeast Pennsylvania, we lost many acres of tender varieties but the damage was much more severe to the north in the Finger Lakes and Ontario. It was a rude wake up call that global warming hasn't quite yet transformed our viticultural realities. We are reminded that it only takes a few hours to turn a profitable vineyard into a patch of suckers and basic practices like hilling up graft unions cannot be ignored. The blessing and bane of farmers everywhere is that they have short memories. That's great for moving past the occasional calamity but not helpful when it comes to taking the necessary preventative measures. In the case of avoiding cold injury to vines, there is a lot the grower can do to avoid damage.

A survey of vineyards in the region demonstrated the unpredictable nature of cold injury. In some places, the expected tender varieties like Cabernet Sauvignon and Merlot were damaged but elsewhere, Cabernet Franc even worse. It is clear that site characteristics, down to the micro scale, has an impact on vine hardiness. Almost imperceptible differences in topography and soil types can make the difference between injury and survival. A slight depression in a field may collect cold air and have heavier, less well drained soils that delay vine acclimation and reduce hardiness. In these cases, drain tile may help, or even contouring to help air drainage. Most growers have found out in the recent winters where their Achilles heel is in their site for cold injury. Happily, almost everything a grower does in the vineyard to produce sound, high quality fruit will also contribute to cold hardiness in the vines. Overall, the goal is to achieve a well balanced and healthy vine which starts with sound vine materials and continues with good viticulture management practices.

Developing a cold hardy vineyard begins well before the first vine is planted with site and variety selection. It continues into the growing season with disease, crop and canopy management and extends past harvest to the time the leaves drop and the vine goes dormant. Any source(s) of severe late season stress on the vine will increase the risk of cold injury. Removing the fruit is the cue for a vine to begin shutting down so the earlier the harvest the better in terms of vine acclimation. This means planting the right variety on the right rootstock. One of the biggest problems facing growers in extended, wet season such as 2003 is the control of late season powdery and downy mildew. These diseases can quickly defoliate vines of all ages and leave them without the necessary leaves to generate, through photosynthesis, carbohydrates that provide the vines with insulation and growth resources in the spring. Maintaining a late season spray program is a good idea to preserve these valuable leaves and to reduce fungal inoculum loads going into the next season. The phosphorous acid products have worked well on downy mildew and sulfur or Stylet Oil can be used to control powdery mildew. Cabernet Sauvignon ripens late so it is harvested very late, sometimes in November, and has little time before the first hard frost to accumulate sugars in the wood. Fall frost is a constant threat with late season varieties and can drop leaves prematurely. If a frost fan or other

frost prevention measures are available, they should be used to protect the leaves. Evidence from Ontario indicates that wind fans may also help significantly during the winter to ameliorate the effects of a freeze. A vine also requires time to move water out of xylem as part of the hardening off process. If vines are active late into the season, this important process may not fully conclude and cells may be at greater risk for freeze injury. That is why grow tubes must be removed from young vines in August in order to give them enough time to harden off.

Hilling up over graft unions on vinifera vines is essential. These are high value varieties that need to be protected. A survey after the recent hard freeze in the Finger Lakes indicated that vines that were hilled up had much greater potential for retraining and returning to productivity the following year than unprotected vines. Replanting randomly killed vines compromises vineyard uniformity and wine quality will suffer. It is difficult to reestablish vines in mature vineyards. Hilling up is tedious but if the right equipment is used and the soil is in the proper condition, it can be done quickly. If you have little or no experience hilling up and taking down, you should spend some time with a grower who knows how to do it.

To some a healthy vine means a vigorous, big plant but this can be problematic for overwintering vines. While there is not significant evidence that overstimulating a vine with seasonal or post-harvest nitrogen fertilization will compromise hardiness, it is clear that vines should be in balance and experience neither nutrient deprivation nor excess. The same applies to water and the use of irrigation. In drought years, irrigation may be necessary to enhance fruit quality but also to avoid water stress. As ever, the goal is a well balanced vine that has adequate time to store carbohydrates and harden off after harvest.

Other important post harvest vineyard care activities include weed control

Winter injury to vines is one of the biggest threats to wine quality and the sustainability of commercial vineyards in the East, Mid-west, and Washington. We have learned that injury can occur even to native varieties and hybrids, which are considered our most resilient vines. We know that vinifera cultivars display varying degrees of hardiness but even that can vary from one season to the next and one block of vines to another. The best overall strategy for cold hardiness in an established vineyard starts with pruning and the quest to achieve a balanced vine. We may go another eight years without a serious freeze. Or, it may happen again this winter. You can choose your level of risk.

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