

Guide to Assess Freeze Damage of Grapevines in Early Summer

Imed Dami, Extension State Viticulturist

This factsheet serves as a guide to assist you with assessing the extent of grape vine damage from the 2014 winter freeze. There are five (5) categories with accompanying photos taken in early summer and describing various levels of vine damage from least (category 1) to most damage (category 5). In category 1: vines suffered some bud and cane damage resulting in crop loss. If the vascular system is alive, then vines can be rehabilitated and will recover in subsequent years. However, if the vascular system is damaged then “vine collapse” may occur later this summer and those vines can no longer be rehabilitated. Cold damage of the vascular system is more obvious with cordon and trunk damage in the following categories. In category 2: vine is damaged to such an extent that it cannot produce fruit in 2014. Rehabilitation can be attempted, but vine recovery to produce fruit in subsequent years is not guaranteed. In category 3: vine is damaged to such an extent that it cannot produce fruit in 2014 and cannot be rehabilitated to produce fruit in subsequent years. In category 4: vine’s graft (scion) is dead and necessitates removal and replacement of the vine’s rootstock. In category 5: vine is dead above and below the ground.

1. Grapevines that generally can be rehabilitated



Fig. 1.1. Despite bud damage and crop loss in 2014, this vine will recover if no vascular tissue injury occurred.



Fig. 1.2. Close-up showing dead buds on dead canes/spurs, but live shoots from cordons.

Note: Vines may have sustained vascular damage (not visible) which causes “vine collapse” in late summer. In this case, vines cannot be rehabilitated and needs to be replaced.



Fig. 1.3. Vine collapse of Pinot gris (due to vascular tissue damage) following the 2009 freeze in Wooster, OH. Photo was taken later in the season in August 2009.

2. **Vine is damaged to such an extent that it cannot produce fruit in 2014. Rehabilitation can be attempted but vine recovery to produce fruit in subsequent years is not guaranteed**



Fig.2.1. Dead buds, canes/spurs, cordons and trunks. But shoot growth (suckers) of vine's graft (or scion) from trunk base or graft union. Suckers from the vine's graft can be trained to new trunks and cordons.



Fig.2.2. Dead cordons and trunks. But shoot growth (suckers) of vine's graft (or scion) from trunk base or graft union. A large number of suckers is favorable to retrain vines.



Note: Suckers from vine's graft are susceptible to breakage in early summer (wind, machinery, training, etc). If fewer than four suckers remain and showing fast growth (longer internodes than normal) then those vines with "bullwood" (bull cane) are unlikely to recover. Also, presence of crown gall will reduce the probability of recovery. In all these cases, vines cannot be rehabilitated and should be replaced.



Fig.2.3. Presence of crown gall at or above the graft union
Reduces the probability of vine recovery.

3. **Vine is damaged to such an extent that it cannot produce fruit in 2014 and cannot be rehabilitated to produce fruit in subsequent years**



Fig. 3.1. Dead buds, canes/spurs, cordons and trunks. The weak and low number of graft suckers (1-2) and presence of rootstock growth is an indication of low probability of vine recovery.



Fig. 3.2. Close-up to show the graft (scion) and the rootstock. To distinguish between the two, note the stem color and leaf shapes are different.



Fig.3.3. Minimum and sporadic shoot growth on spurs, cordons and trunks is an indication of severe damage to the vascular system of the vine. The vine will not recover and should be replaced.



Fig. 3.4. Weak shoot growth on cordons and mid-trunk is an indication of severe damage to the vascular system of the vine. Vine will eventually collapse later in the summer and should be replaced.

4. **Death of a vine's graft or scion that necessitates removal and replacement of the vine's rootstock**



Fig. 4.1. Dead cordons and trunks. This vine's graft (scion) is dead and the growth at the base is of a rootstock. In this situation, the vine's rootstock must be removed and the variety replaced.

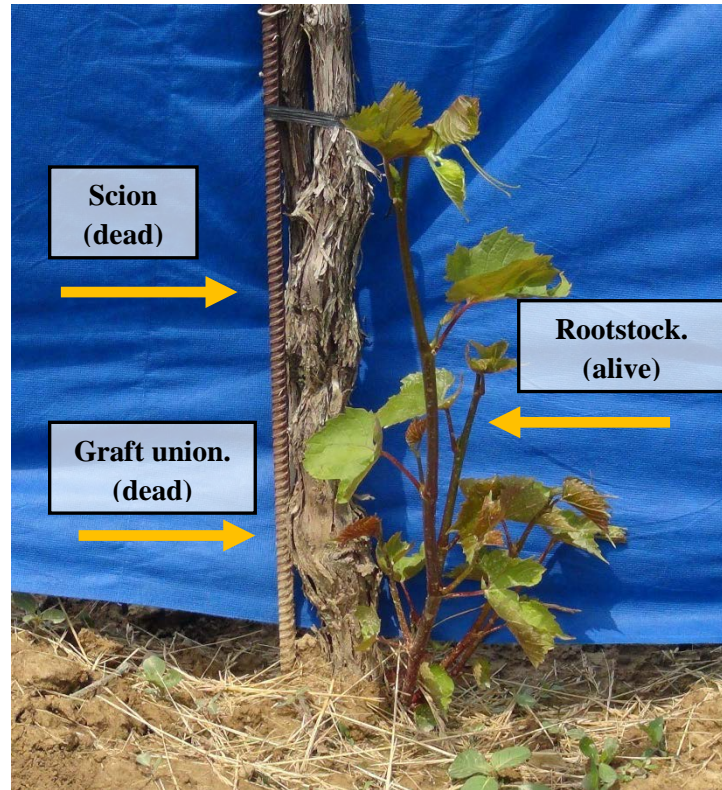


Fig. 4.2. Close-up of the rootstock growth (below the graft union). In this case the rootstock is C-3309, characterized by reddish stems and smooth and shiny leaves.



Fig. 4.3. The vine's graft (scion) is dead, but the vine's rootstock (green shoots) is alive. In this situation, the rootstock must be removed and the vine replaced.

5. Vines must have reached mortality (that is, died) above and below ground

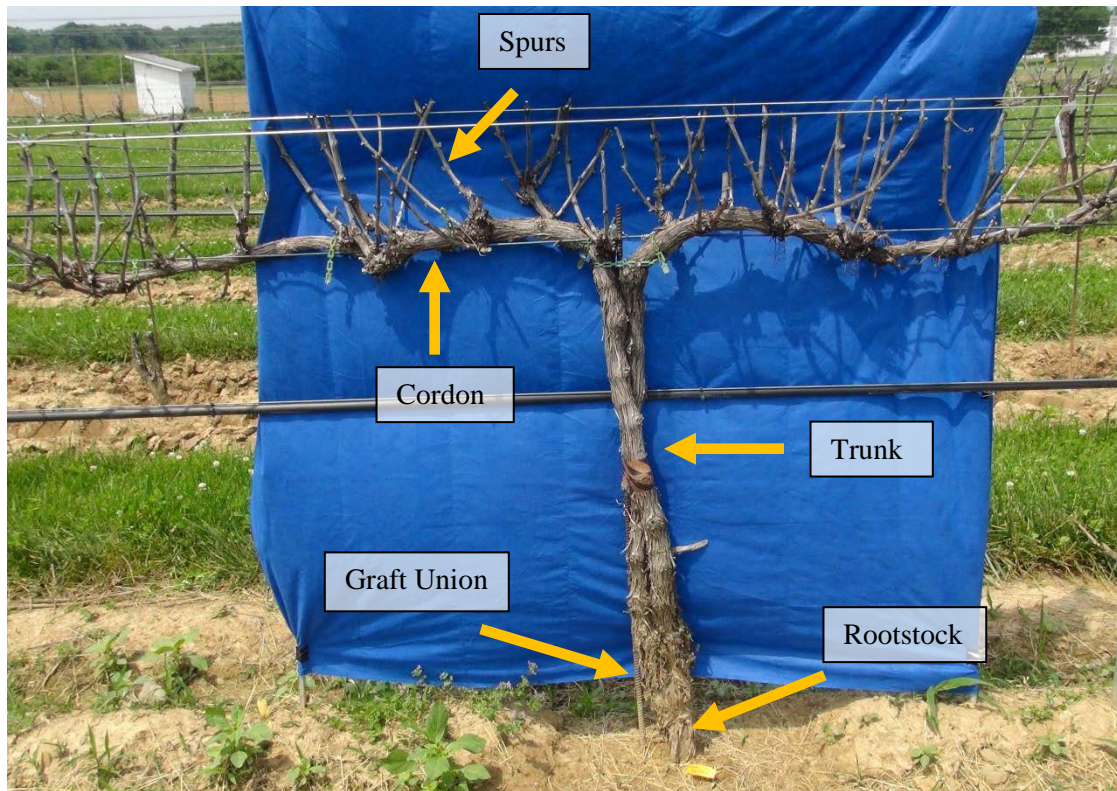


Fig. 5.1. Dead buds, canes/spurs, cordons and trunks. No growth above or below the graft union. This vine has reached mortality and is definitely dead.