Impact of Easter Freeze on 1-, 2- and 3-Year Old Muscadines and Recommended Actions

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Younger Carlos and Magnolia vines (1-, 2- and 3-year) in southeastern North Carolina counties (e.g. Bladen, Pender, Duplin and Scotland), were particularly hard hit by the Easter Freeze. In the long run, cold-injured cordons will never recover, and though it is difficult to think right now about lopping off nearly an entire cordon on an injured two-year, or three-year-old muscadine vine, it is nonetheless an important step to take in fully restoring the muscadine vine's "food and water pipe system," as well as to prevent disease infection. The fungal pathogen we most commonly isolate from injured cordons and trunks is *Botryosphaeria*. This fungus (usually *Botryosphaeria dothidea* but occasionally other *Botryosphaeria* species) is a common invader of wounds on woody plants, causing dieback on dozens of woody plant genera, not just grapevines. Some common names for this disease on grape are 'dieback' or 'dead arm'.

Epidemics of this disease on woody plants typically follow a wounding event (like a freeze). Symptoms often do not become visible until the plant goes under additional stress such as drought, heat, heavy crop load, etc. Fungicides are only partially effective; control is primarily achieved by pruning to remove injured or infected canes and cordons.

We think there is some advantage to removing cold-injured cordons as soon as is practical on 2- and 3-year-old vines -- certainly this spring or early summer rather than waiting until next winter. Injured cordons are readily infected by the fungus, and experience with blueberries suggests that the incidence and severity of infection increases over the weeks and months following injury. Once the disease gets started, pruning must be severe enough to remove all discolored, infected wood, so that when viewing a cross-section of the cut stem, only healthy green tissue remains.

Step 1. Carefully inspect cordons of 2 and 3 year old vines for cracks (left) and then proceed to remove this cordon by making a cut at the point shown in the right photo.

Step 2. Next inspect the condition of the wood beneath the bark. The pruning must be severe enough to remove all discolored, infected wood, so that when viewing a cross-section of the cut cordon (left photo), only healthy green tissue remains. In the photo on the right (below), you will note the brown tissue on a section of cordon where the bark was peeled away. The objective is to cut back until you reach only healthy green wood.

Step 3. New base buds or latent buds will soon break from the area just beyond the cut made on the cordon. In this photo you can see several potential buds that can be used to form a replacement cordon this summer. The slight discoloration you see in the cross-section of wood where the cordon was cut is from the lopper itself – this tissue is healthy.

More severely injured 2- and 3-year vines: In the next series of photos you can see another vine in the same 2-year-old Carlos vineyard (Duplin County) where the grower had previously cut the cordon back in early May, but by the end of the month it was obvious that this vine was not recovering very well. Severely injured vines will produce shoots that are weak, and will have short internodes. The leaves will have an off-color and may even have a whitish cast. In this vine, we made a cut just below the "V" where the vine branches off. And you will note the very serious discoloration in the wood – confirming that this vine was more severely injured by the Easter freeze than the vine shown in the previous section of this advisory (above). In the final picture below (bottom right) you can see where we did locate bright green tissue on the trunk. In this last photo we started to peel away the bark at the point just above where the cut was made with the lopper, and in this zone we did not find any discolored tissue.

When you must make a more severe cut into the trunk itself, you are counting on having new shoots break from what is called a latent bud, and in the photo below you can see one of these latent buds is already beginning to break on a severely injured trunk of Carlos. Make your cut on this trunk just above the latent bud that will be used for trunk replacement (right photo below). You also have the option of re-training the vine using a sucker from the base of the vine, but in this vineyard the suckers had been removed early in May for weed control purposes. In hindsight, we wish the suckers had been kept.

Older vineyards: In older vineyards that have been declining in productivity in recent years, this freeze may have provided the incentive you need to go ahead and implement a cordon renewal program, but we recommend delaying removal of cold injured cordons in older vines (e.g. 8 to 20 years) until the dormant season. However, we still recommend more proactive measures in younger vineyards during the month of June, and pruning back to healthy wood in 1-, 2- and 3-year-old vines will minimize colonization by *Botryosphaeria* and crown gall, and will also permit these vines to put their energy into developing healthy replacement arms over the course of the 2007 growing season.

One-year-old vines: In one-year-old vines, the extent of the cold injury is more obvious than in 2- and 3-year vines. As one grower said to us, "the one-year vine tells you where it's been hurt." And, you will often see new shoots breaking rather quickly just beneath the split or crack on the one year old trunk. It may be possible to renew the trunk from a healthy shoot that appears just beneath a visibly cracked area on the trunk. But, in the long run, it may be safer to simply select a sucker that has broken from the base of the vine as a replacement trunk, and not take a chance on relying on a shoot from a trunk that may be partially cold injured.

Several suckers will typically develop at the base of a cold injured vine. When the strongest sucker is about 12 inches long, attach it to a bamboo stake, and remove all the other competing suckers. Various materials are used for attaching vines to the bamboo stake. The current standard material is a plastic tape sold by most vineyard supply companies. Train the replacement sucker up the bamboo shoot to the trellis wire. When the vine reaches the wire, pinch it back to approximately 4-5 inches below the wire. This will encourage lateral buds to develop into shoots that will be trained to the wire as permanent arms or cordons. Lateral shoots coming off the permanent arms should be kept pinched off at about 12 inches from the cordon to promote rapid growth (extension) of the developing cordons.

Note on normal bark peeling: We've received several calls recently from newer growers with older vines that are not sure if what they are seeing is freeze damage or the normal bark peeling characteristic of muscadines. So to clarify, the freeze damage, if you have it, will show up on the youngest wood (where new shoots should be emerging) – if you have no splitting on this one-year-old wood, chances are good that your cordons and trunks are not freeze damaged. The pictures below show examples of normal bark peeling. (See the first picture on page 1 for an example of a crack in a freeze-damaged cordon.)