

Wine Grape Injury Assessment

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I. Evaluation

A. Nodes (Figure 1 and 2)

- i. Dormancy broken, significant shoot development prior to freeze
 1. Dormant buds
 - a. Carefully using a razorblade, make a series of shallow slices across the surface of node
 - b. Each node has 3 buds. The primary bud breaks first and is the bud that is the first bud lost. Examine after each slice for evidence of bright green tissue in the secondary and tertiary buds.
 - c. You should cut 100 buds/variety.
 2. First leaf stage
 - a. Carefully using a razorblade, make a series of shallow slices across the surface of node
 - b. Each node has 3 buds. The primary bud breaks first and is the bud that is the first bud lost. Examine after each slice for evidence of bright green tissue in the secondary and tertiary buds.
 - c. You should cut 100 buds/variety.
 3. Beyond first leaf stage
 - a. You may not be able to cut through the node very easily. The buds are at the fuzzy stage and it is difficult to get a good cut.
 - b. While in vineyards on 4/11 and 4/12, vines that were in the fourth to fifth leaf stage had no obvious live buds. You may want to make a cut right at the base of the node, but not into the cane tissue. My observations were that most of this tissue was dead (dark, brown, water soaked). Also, on 4/11 during the rain, the whole bud complex was, for lack of a better descriptor, squishy.

B. One-year old wood (Figure 3 and 4)

- i. Make a shallow, oval shaped cut into the spur/cane wood.
- ii. There should be a very fine bright green ring of vascular cambium around the edge of the cut.
- iii. The wood tissue should be a whitish green.
- iv. The brown “core” in the center of the shoot, cordon, or cane is the pith. It is normal for it to be brown.

- v. Most of these tissues that I have examined are living. However, if there are no living buds it is useless.

C. Cordons and trunks (Figure 5)

- i. Make a shallow, oval shaped cut into the spur/cane wood.
- ii. There should be a very fine bright green ring of vascular cambium around the edge of the cut. If that ring is brown, the vascular cambium and primary phloem are dead.
- iii. There should be a greenish gradient to the older woody xylem. The wood tissue should be a whitish green. If that gradient is just another shade of tan, you have damage to the primary xylem. If the wood is creamy, water soaked in appearance and/or have dark brown or black streaks, you have damage to the secondary xylem.
- iv. The brown “core” in the center of the shoot, cordon, or cane is the pith. It is normal for it to be brown.

II. Actions

- A. As hard as it seems, in all of the above situations the action to take at this point is to do nothing. Growers should wait for secondary, tertiary, and/or latent buds to begin to break.
- B. Dr. Turner Sutton is developing spray recommendations for injured plants. For now, if you get re-growth, pickup your spray program appropriate for the growth stage and weather.

III. What you will see later

- A. If the grower’s vines have no cold injury, congratulations, continue as normal.
- B. If there are live secondary buds and healthy permanent wood, there is a potential for perhaps 60% or more of a crop on many if not most *V. vinifera* varieties. For Concord and Niagara, the secondary buds might produce about 1/3 of a crop.
- C. If there are no live secondary buds, live tertiary buds and healthy permanent wood, there is a potential for a small partial crop on many if not most *V. vinifera* varieties. For Concord and Niagara, the tertiary buds are unproductive. There will be vegetative growth but no crop.
- D. If there are any live buds and there is cordon or trunk damage, any cropping should be monitored closely. Vines should not be stressed.
- E. If all the buds are dead on fruiting spurs or canes (1-year old wood), green woody tissue on those spurs or canes is useless. However, still do not do anything. Just wait and remove all dead tissue at once instead of making a lot of small cuts. You may be making one or two big cuts depending on how many trunks there are.
- F. If you have live cordons and trunks, latent buds on the cordon and trunks may break within the next several weeks. **DO NOT REMOVE** these latent buds if you have lost your fruiting buds. These are possibly going to save your vine.
- G. If there is damage to the permanent woody tissue, shoots may develop if you have live buds. However, these shoots will collapse at the occurrence

of the first warm to hot weather. The length of the shoot will depend on the percentage of live trunk and cordon. The more that is alive, the longer the shoot growth.

- H. Dead trunks and cordons will be easier to find as the wood dries out. Early signs of trouble will be weepy, patchy spots underneath the bark. Just look for a grapevine's equivalent of a "broken water pipe."
- I. You may see water flow through the xylem even in a vine that will eventually die.

Several good websites exist that include photographs or diagrams of how to make your cuts and what to look for when you do. These sites are:

<http://www.nysaes.cornell.edu/hort/faculty/pool/budcoldinjury/Assessingbudcoldinjury.html>

<http://www.nysaes.cornell.edu/hort/faculty/pool/trunkinjury/tihtml/trkinjtablecontents.html>

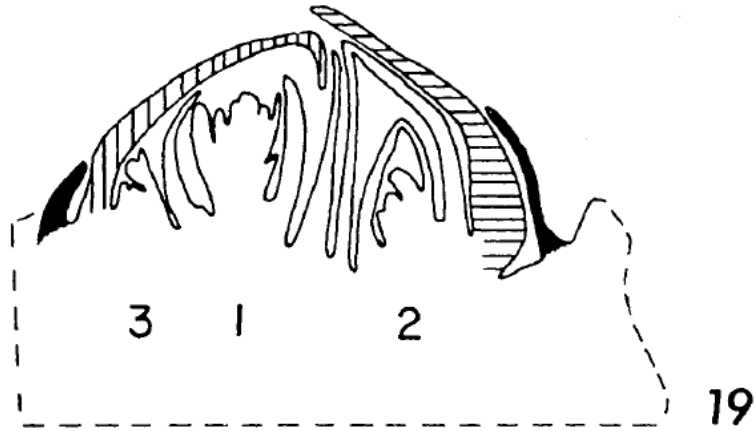
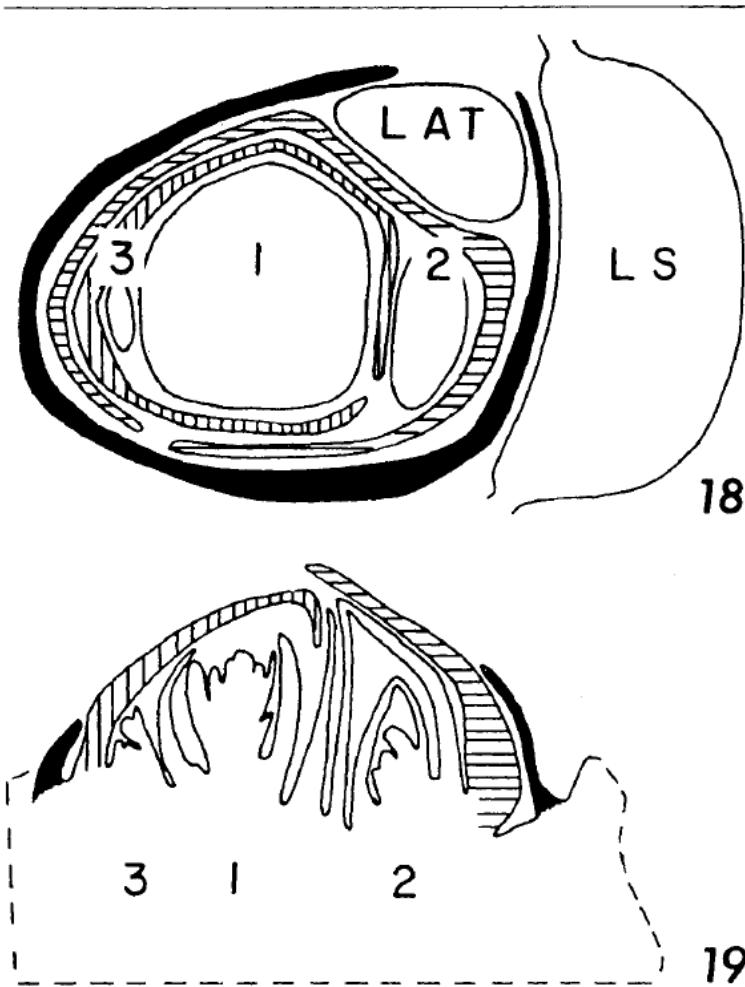
<http://www.nysaes.cornell.edu/hort/faculty/goffinet/AnatomyWinterInjury.pdf>

<http://www.nysaes.cornell.edu/hort/faculty/pool/Managing%20WI%20Vyns/Manage%20WI%20Vineyard%20What%20we%20learned%20in%202003.htm>

<http://www.nysaes.cornell.edu/hort/faculty/pool/Managing%20WI%20Vyns/Manage%20WI%20Vineyards%20II%20-%202003%202004%20was%20worse.htm>

<http://winegrapes.wsu.edu/frigid.html>

Figure

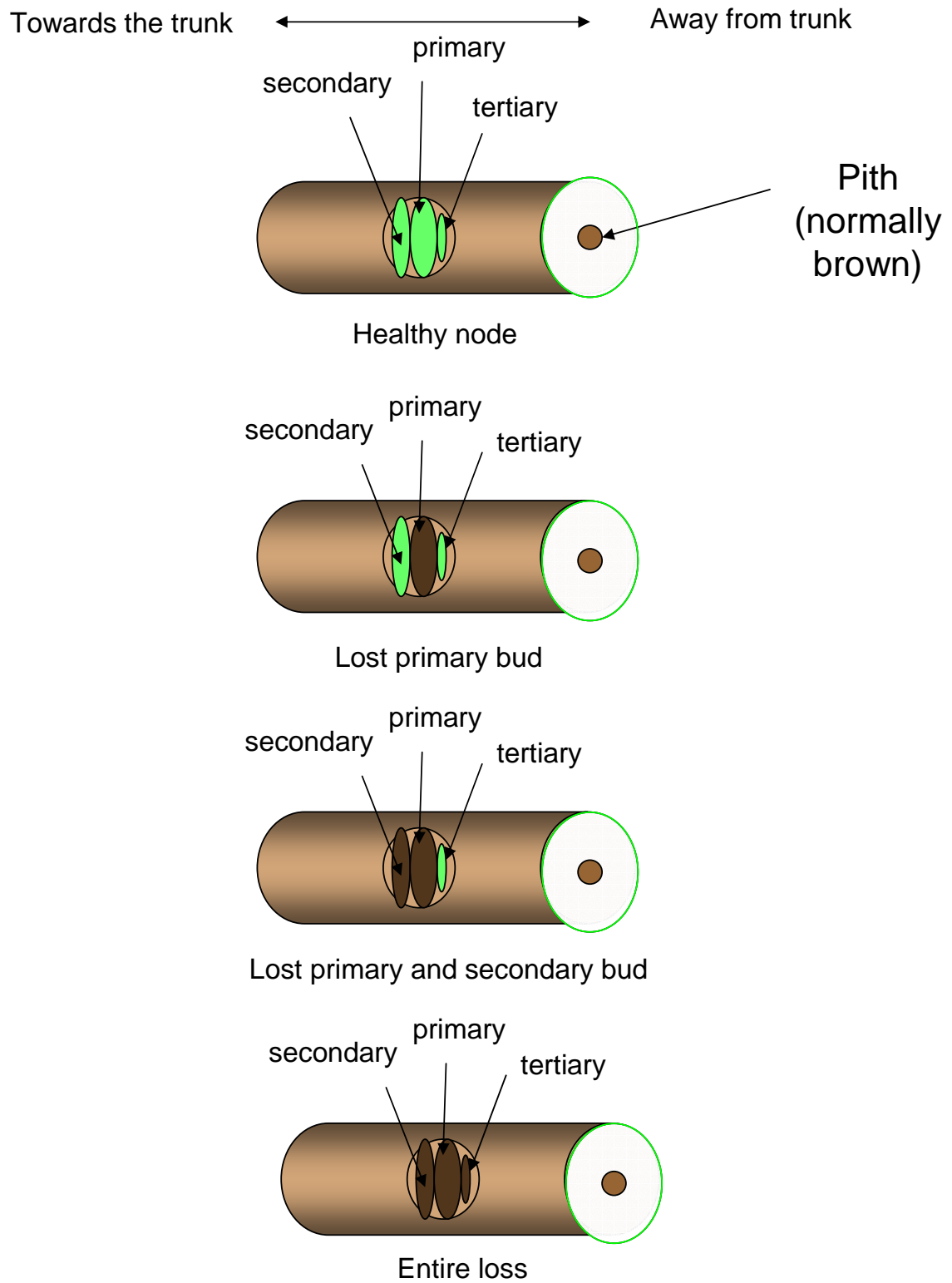


“Figure 18. Diagrammatic transverse section through a compound bud (eye) of *Vitis labruscana* ('Concord') showing relative positions of leaf scar, lateral shoot, and 3 dormant buds. X17.

Figure 19. Diagrammatic longitudinal section in the plane of the cane axis showing the compound bud of *V. labruscana* ('Concord'). Leaf scar indicated by broken line at right of bud. X17. Figures 18-19 from Pratt (59). Abbreviations for Figures 18-19: Lat, lateral shoot; LS, leaf scar; 1, primary bud in axil of prophyll (solid black) of lateral shoot; 2, secondary bud in axil of basal prophyll (horizontally hatched) of primary shoot; 3, tertiary bud in axil of the next higher prophyll (vertically hatched) of the primary shoot.”

Source: Charlotte Pratt. Vegetative Anatomy of Cultivated Grapes--A Review Am. J. Enol. Vitic., Sep 1974; 25: 131 - 150.

Figure 2. Schematic of node placement on grapevine shoot.



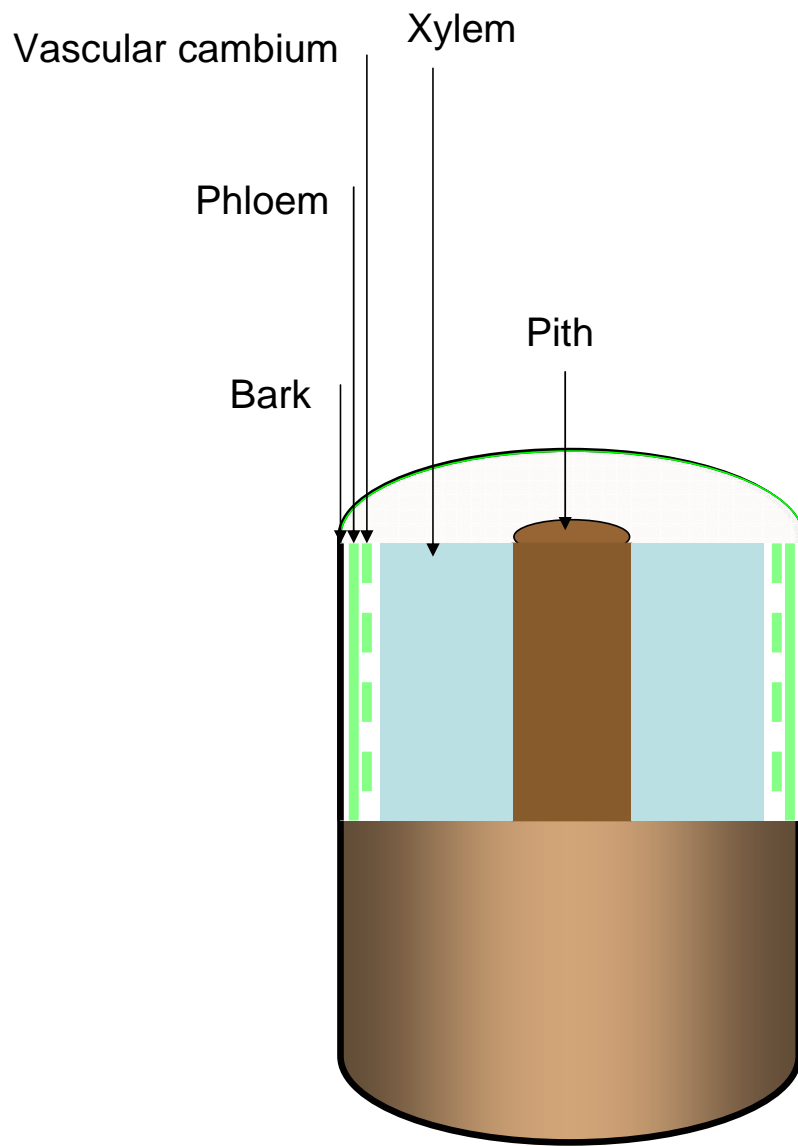


Figure 3. Crude schematic of grapevine shoot/trunk.

Figure 4. Schematic of 1-year old spur/cane tissue.

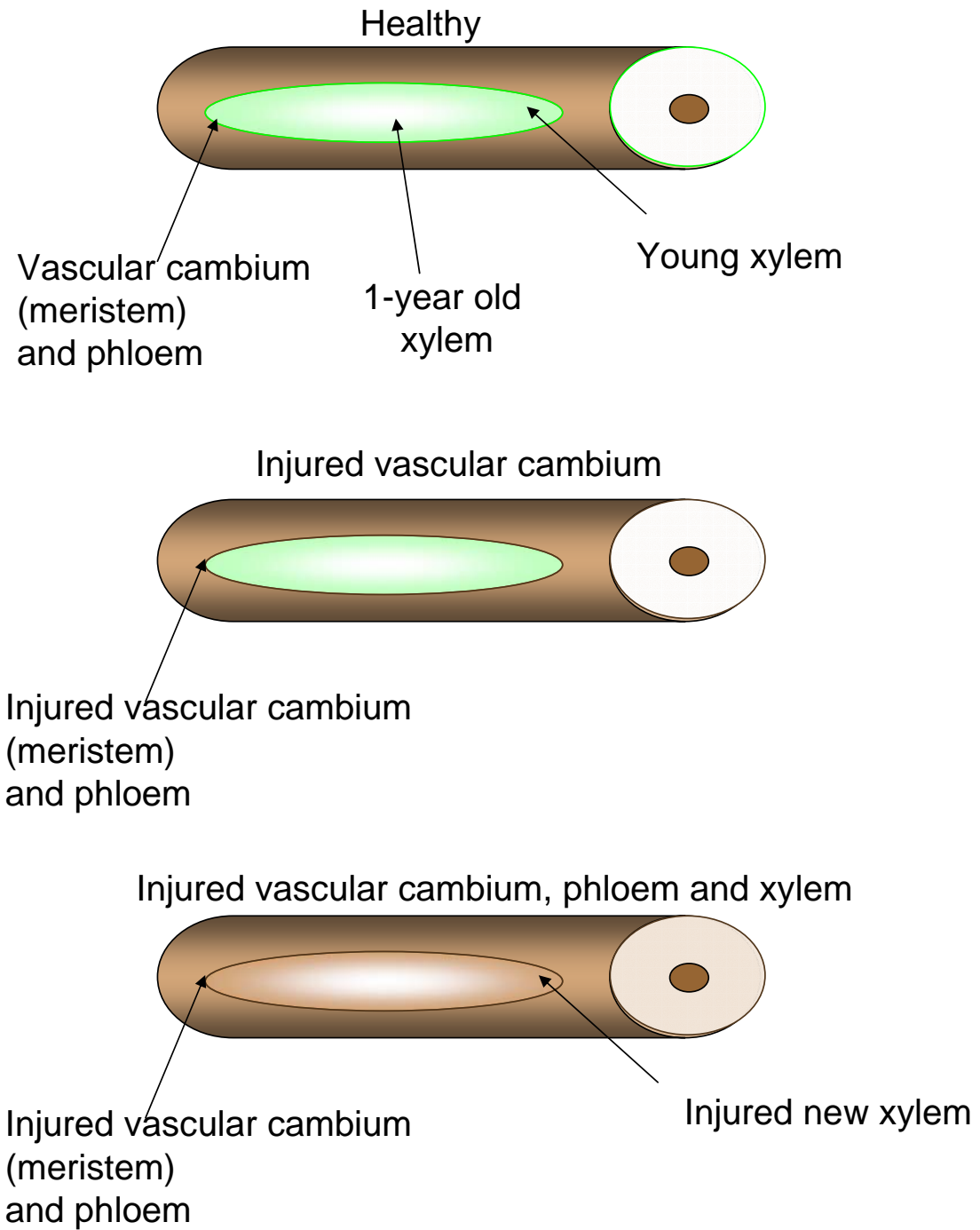


Figure 5. Schematic of grapevine trunk

Health

