Dealing with Cold Injury to Grape Vines

Prepared by

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With the recent cold episodes in January we have noted some regions of Niagara have substantial bud injury to some cultivars. KCMS is continuing to do the vineyard evaluations for most of Niagara, bud survival and bud hardiness data posted currently on the CCOVI VineAlert web page (www.ccovi.ca/vine-alert). We are also doing evaluations as requested (fee for service) for those wishing site specific information. Contact us at ryanb@kcms.ca or 905 688-8189 or 905 892-7050

It is important to recognize bud injury at your vineyard and that damage levels will differ with cultivar and location in the vineyard at your location. Your neighbour with similar cultivars may not have the same damage levels as injury to vines is influenced by a number of factors:

- Crop level in 2010 (too light or too heavy crop levels for proper vine balance = more damage observed).
- Vigour – those vineyards with vines having large diameter shoots, widely spaced nodes (distance between leaves on the shoot)
- Dense canopies (excessively shaded canopies) – often blocks that have been hedged multiple times per season
- Previously damaged vines (survivors of 2003 and 2005)
- Vines in wet spots or low lying areas regardless of slopes
- Excessive leaf removal in the previous growing season (may limit individual bud hardiness)
- Downward pointed shoot training (lower arms of Scott Henry, top wire cordon, Sylvoz, Hudson River Umbrella, Geneva Double Curtain) may result in reduced shoot photosynthesis and reduced carbohydrate storage in tissues that is known to determine tissue hardiness
- Stressed vines (excess disease infection, drought stress, excessively shaded canopies, etc)
- Along with other factors

IMPORTANCE -

If you have blocks or cultivars with the above attributes it is highly recommended that you do some preliminary assessment of bud survivals for each cultivar in suspect blocks.

FAILURE to check can lead to excess spending on pruning, poor vine balance in 2011 and possibly missing necessary recovery steps to maintain long term block and cultivar health and profitability

Assessment

At KCMS Applied Research and Consulting, we follow a similar sampling procedure that is used by universities, research and extension agencies in Canada and the US. For each cultivar in a suspect block, it is necessary to take sample canes to determine percentage of primary bus survival. We do not assess for secondary bud survival as pruning decisions for crop levels and overall vine health is best estimated from primary buds and most efficient use of time.

Selection – the canes selected should be those that you would normally leave for tying in the spring. On most vines there are multiple canes that could be selected so the removal of a single cane is not harmful. You should select 10 to 12 of these canes (no more than 1 cane per vine) from across the cultivar you wish to assess. If there are obvious topographic differences of vine size differences you may need to take two samples but try to sample to represent the area for which you want information.

Always time the dormant sample cane closest to its point of origin on the shoot (Do not select lateral shoots!). You can then trim the sample cane to 12 to 15 buds (up from the base). There is no need to keep the entire length as you would not have kept overly long canes in normal pruning and trimmed off the ends. Secondly, the buds closest to the base of the cane are generally the hardiest so knowing survival in the first 10 buds is important

Handling – if the freeze was recent there is a chance that the buds may not have thawed since exposure to the cold temperatures. We routinely collect samples and hold for 24hours to 48 hours at room temperature before evaluating. This allows for oxidative actions to take place and the damaged bud growing points to turn brown.

Examination - It is important to make the cuts at proper depth to establish whether the growing point (meristem) of the primary bud is intact or injured. Frequently for people new to examinations, the cuts are made too shallow, too deep or with a coarse tool/knife (like pruner blades) that fail to clearly allow one to if the bud is alive or dead

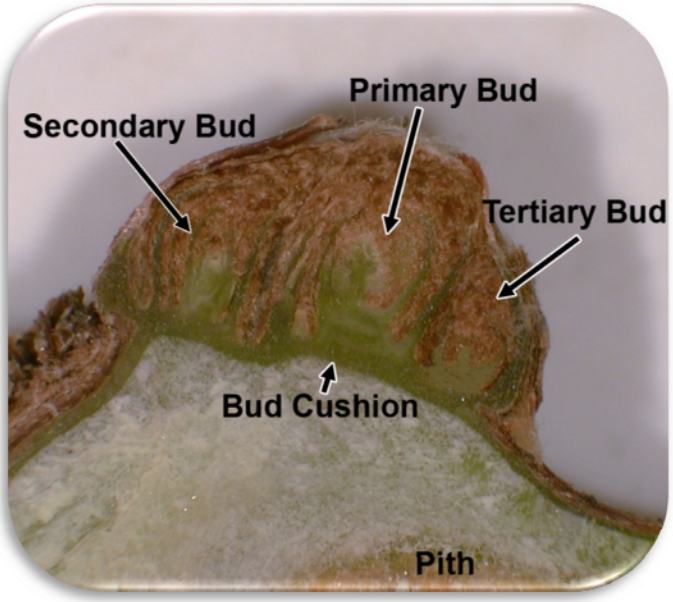

Figure 1 - Longitudinal section of a grapevine (cv. Merlot) bud.

Figure 2a & b – Too shallow a cut to accurately assess bud damage. The tip of the primary bud may be visible however not enough to confirm if any damage has occurred.

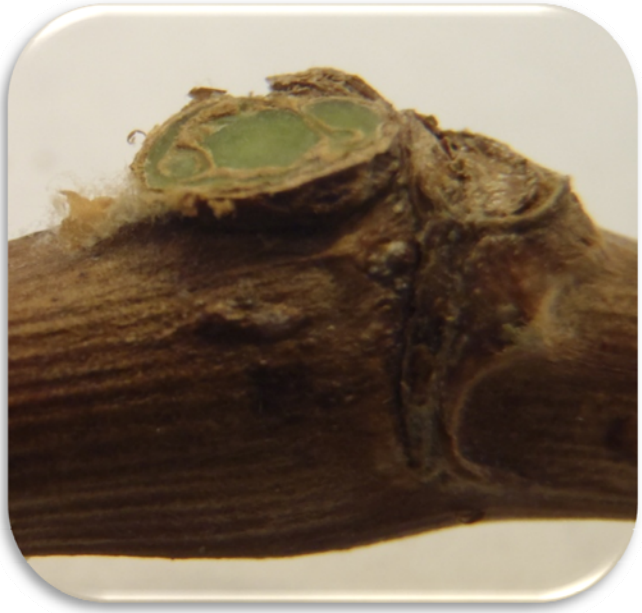

Figure 3 – Too deep a cut. Bud cushion is exposed that will appear green even if buds are damaged.

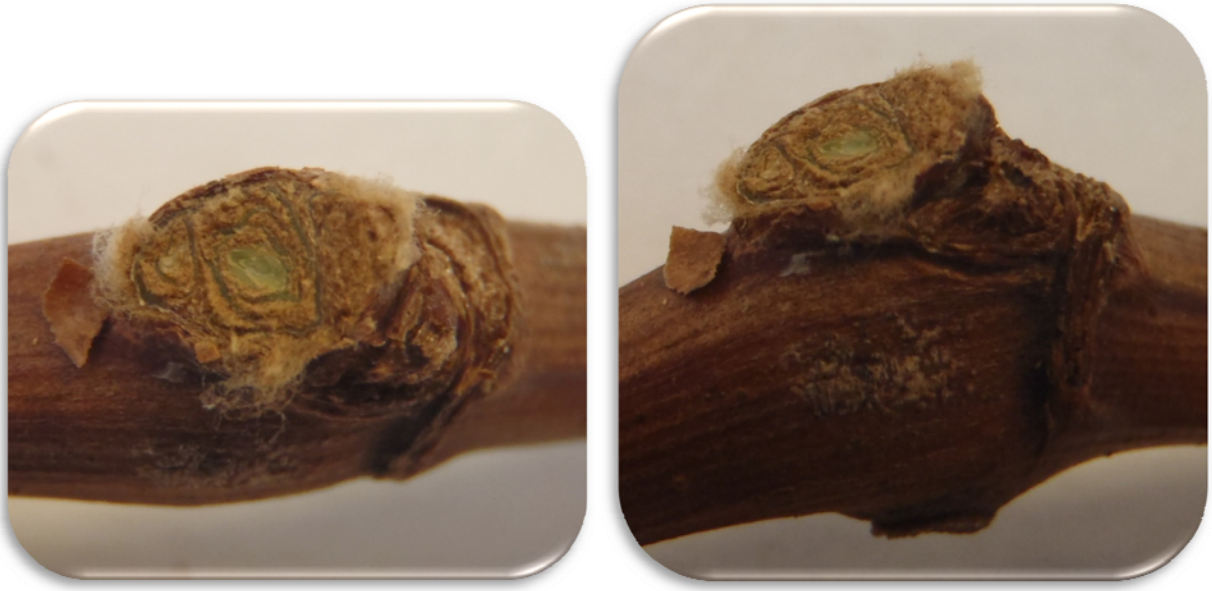

Figure 4a & b – Proper cut to assess primary bud. The tip of the secondary bud may be visible.

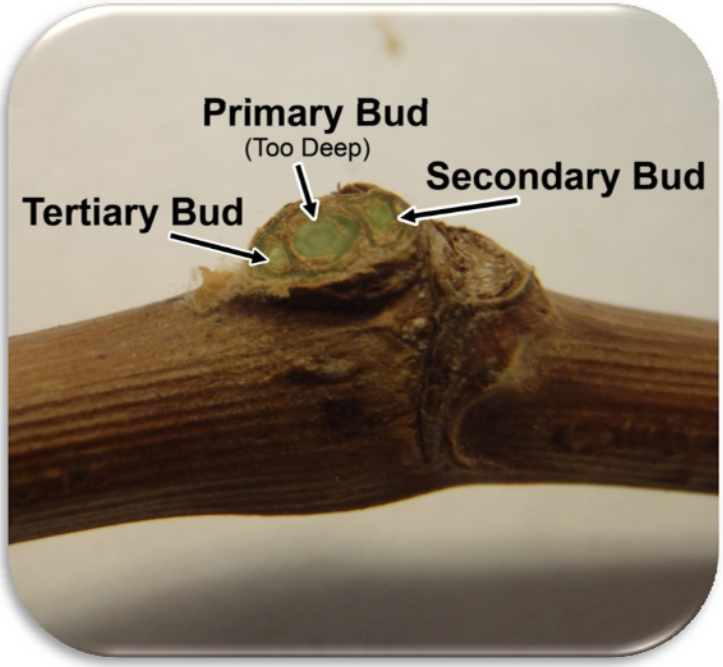

Figure 5 – Proper cut to assess secondary and tertiary buds but too deep for primary bud.

Recording the information – You should record the information for each cane and collectively for each cultivar sample. Some record live/dead buds based on cane position (remember the first bud from the base is number 1 and it progresses in number up the shoot so that bud numbers 10 to 15 are near the tip of your sample cane!)

Where possible, try to note if this sample is representative of the entire cultivar in the block or just a small location within the block. To protect against sampling error, we suggest that at least two samples 7 to 10 days apart be taken after a single freeze injury episode. If additional cold temperatures are experienced where you suspect injury may have occurred, take a sample 24 to 48 hours after the cold event, warm the samples as above and then reassess.

The above sampling need not be done for all cultivars, however after the recent January temperatures at susceptible locations we have found significant injury to even our most hardy vinifera vines – Chardonnay, Cabernet Franc and Riesling to name a few. With that in mind, you may want to check your own sites just to be sure so you are not spending a lot of money on finish cane pruning when it may not be time or cost effective!

Soon to come – **Strategies to Recover from Winter Damage!**