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Estimating Functional Nodes Retained in Winter and/or Frost Damaged Vineyards.

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Assume 90 nodes retained at pruning.

1. There are 2-frost episodes in the spring after budburst.
2. After the last chance of frost has passed (usually around 1-7 June) and before shoot crowding has begun, counts were made. Selecting *modal* (representative) vines and make counts to determine bud status.
    a) First, the number of nodes producing no shoot is determined;
    b) Second, the number of nodes with a frosted, dead primary bud counted;
    c) Finally, the number of nodes with a dead secondary is counted.
3. Assume the following results for example:
    a) 10 blind nodes
    b) 32 dead primaries
    c) 13 dead secondaries

These data will be handled as follows: 90-10=80 functional nodes based on blind status.

13 Secondary + 13 of dead primary buds = 80-13=67 productive shoots of which 32-13= 19 with dead primary buds. 67-19=48 fully functional nodes. Since secondary buds are ~0.33 as productive as primary, then 19(0.33)= 6 additional functional node equivalents.

Thus, there are 48 fully functional nodes with live primaries and secondaries. BUT, those 19 secondaries have the capacity to produce 1/3 of the crop of a primary, so (19) (0.33)= 6 bud equivalents.

Thus the ***functional nodes*** remaining on this 90-node vine is 48 + 6= 54. So, we can assess the general reduction in yield at this stage to be 54/90=60% of the original full crop. If the original 90 nodes retained were anticipated to be 10 T/A (conservative for Niagara) then the crop would be 6.0 T/A. Not great, but not a total loss either.

To restate:

Original bud # = 90
Blind node # =10, so 90-10=80
Frosted Primary bud # =32
Frosted Secondary bud # =13

Adding the 13 dead secondary buds to 13 of the 32 dead primary buds adds an additional 13 BLIND from a crop production status.
OR
80-13=67-nodes with productive shoots. Of these, 32-13= 19 have only a secondary bud. 67 – 19= 48 fully functional nodes.

19(0.33)=6 full node equivalents.
Add 6 to 48 = 54 ***FUNCTIONAL NODE EQUIVALENTS***

@ 10 T/A that estimates the cold impact on crop potential @ a 40% reduction or 6.0 T/A

Obviously there are additional factors later in the season with impact of crop potential; poor fruit-set, hail, etc. This exercise is proposed as a means to avoid the errors of the past so that when the next frost damage occurs we can approach the situation rationally. It can provide a rational basis for decision making in every year that spring frost damage occurs. MOST IMPORTANTLY, IT MUST BE DONE AT THE SPECIFIC SITE WHERE THE DATA ARE TO BE USED.