

# Oregon Wine Advisory Board Research Progress Report

1987

---

## Plant Analysis in Oregon

Tim Righetti  
Kris Wilder

The Plant Analysis Laboratory in the Department of Horticulture at Oregon State University is currently revising tissue standards and fertilizer recommendations for wine grapes. These revisions are the result of a research program that was sponsored by the Wine Advisory board beginning in 1985. We have utilized data collected during recent surveys to assist us in making our revisions. In the 1987 season new standardized sampling procedures and tissue sufficiency ranges will be initiated. Although no one sampling time or tissue type can be expected to be ideal for diagnosing all potential nutritional problems, a midAugust petiole sample collected from the mid shoot of the current year's growth has been selected as the best compromise to get the most information from a single sampling. As more information is collected, petiole samples opposite the first cluster collected at full bloom or from the mid shoot just prior to harvest may be suggested for evaluating specific problems.

In addition to our Oregon data we relied on information from other tissue analysis programs both in the U.S. and abroad. We were one of the few labs still analyzing entire leaves rather than petioles. A change will allow us to make better comparisons with other laboratories. Furthermore, it appears that for many (but not all) elements petiole samples vary over a wider range of values making small analytical differences less important.

Although we feel the move towards petioles is a step in the right direction, it does present a problem for growers whose data has always been based on leaves. We have revised our leaf standards and will still analyze leaf tissue if a grower requests it, but we are encouraging most growers to adopt a petiole program. This year's recommendations will be accompanied by a table to convert elemental concentrations in petioles to approximate elemental concentrations in leaves. Our statistical analysis showed that for most elements the correlation between leaf samples and petioles is fairly strong, but differences do occur. In figure 1 the relationship between leaf P and petiole P is presented. For phosphorus the relationship between the two tissues is exceptionally strong and similar recommendations will result regardless of the sampling approach. In figure 2 the relationship between leaf K and petiole K is presented. A weaker relationship exists, and although high leaf values are generally associated with high petiole values, a petiole analysis will not always give the same answer as a leaf analysis. Since petiole K values vary over a wider range and some researchers report better diagnostic precision with a petiole sample, we feel comfortable about making the change. If we always obtained the same recommendation there would be no need to convert to a petiole system in the first place. Converting from petioles to leaf concentrations is not perfect, but it will allow a grower to compare data collected from the different sampling approaches.

Figure 1

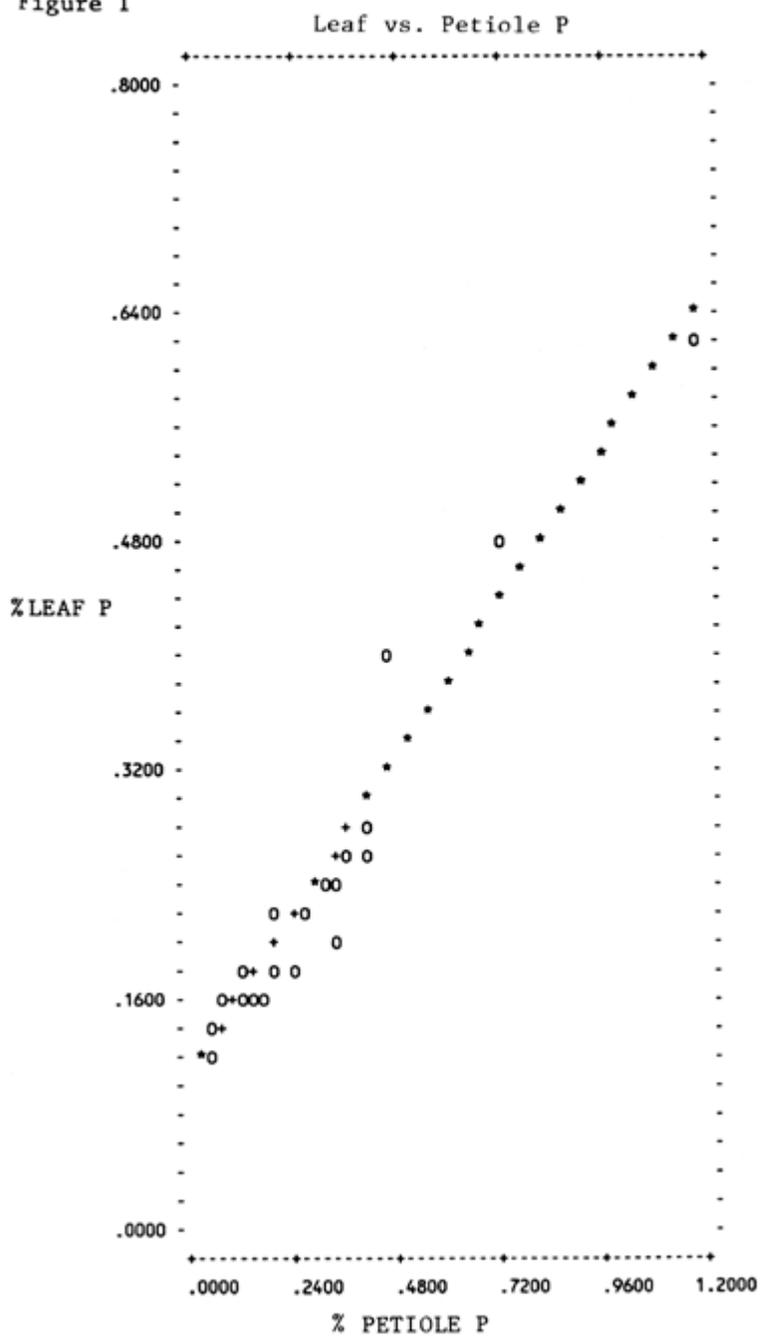
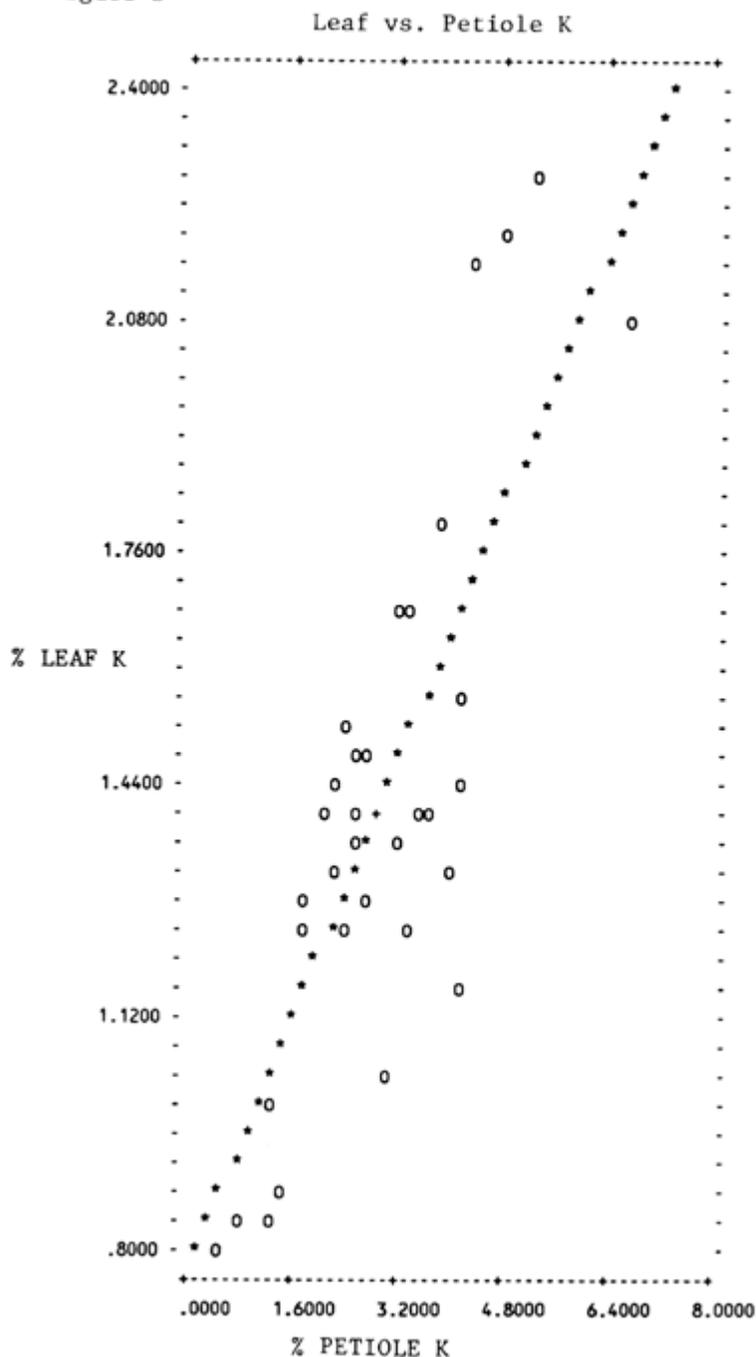


Figure 2



Twelve year summaries for grape petiole analysis for K, P, and B using the past normal ranges are presented in table 1. Similar data using our new standards appear in table 2. Data in both tables is identical. What is different is the sufficiency ranges for the elements. For example, using our previous standards 36% of the samples would be classified as below normal in P, but only 7% are classified as below normal using our current sufficiency ranges. The Plant Analysis Lab will provide interested growers with similar summaries for all elements on both petiole and leaf tissue on request. By comparing the two sets of summaries, the effects of changing sufficiency ranges become clear. Sufficiency ranges for some elements have been altered considerably while others are only moderately fine tuned.

**Table 1.** OSU Plant Analysis Lab Results for Grape Petiole: Willamette Valley Region . . . Twelve Year Average

Deficient	Below Normal	Normal	Above Normal	Excess	
*** Nitrogen ***					
<u>&lt;0.50</u>	<u>0.51-0.70</u>	<u>0.71-1.20</u>	<u>1.21-2.00</u>	<u>&gt;2.00</u>	<u>Total</u>
0	9	19	11	6	45
0%	20%	42%	24%	13%	
*** Phosphorus ***					
<u>&lt;0.10</u>	<u>0.11-0.20</u>	<u>0.21-0.30</u>	<u>0.31-0.65</u>	<u>&gt;0.65</u>	<u>Total</u>
6	16	10	6	7	45
13%	36%	22%	13%	16%	
*** Potassium ***					
<u>&lt;0.60</u>	<u>0.61-0.80</u>	<u>0.81-1.20</u>	<u>1.21-3.00</u>	<u>&gt;3.00</u>	<u>Total</u>
4	0	1	34	4	45
9%	0%	7%	76%	9%	

**Table 2.** OSU Plant Analysis Lab Results for Grape Petiole: Willamette Valley Region . . . Twelve Year Average

Deficient	Below Normal	Normal	Above Normal	Excess	
*** Nitrogen ***					
<u>&lt;0.50</u>	<u>0.51-0.65</u>	<u>0.66-2.00</u>	<u>2.01-2.50</u>	<u>&gt;2.50</u>	<u>Total</u>
0	6	33	2	4	45
0%	13%	73%	4%	9%	
*** Phosphorus ***					
<u>&lt;0.06</u>	<u>0.07-0.10</u>	<u>0.11-0.70</u>	<u>0.71-0.80</u>	<u>&gt;0.80</u>	<u>Total</u>
3	3	32	1	6	45
7%	7%	71%	2%	13%	
*** Potassium ***					
<u>&lt;0.60</u>	<u>0.61-1.00</u>	<u>1.01-3.00</u>	<u>3.01-3.50</u>	<u>&gt;3.50</u>	<u>Total</u>
4	2	35	1	3	45
9%	4%	78%	2%	7%	

Even with more refined sufficiency ranges, mineral analysis is only a tool for improved fertility management rather than a firm diagnosis in itself. Tissue analyses should be combined with observations on vigor, crop load, and general appearance of the vines. The Plant Analysis Lab is currently preparing grower workshops to clarify how a grower should combine tissue analysis and specific vineyard information to aid in designing fertility programs.

There is much work still to be done with the grape data that has been collected. Evaluating nutritional status with special emphasis on quality needs more attention. Hopefully, the program will continue to evolve and improve. We are especially grateful to the many growers who have participated in our surveys, and continue to help us develop a better program.