SAMPLE THEORY AND FRUIT ANALYSIS

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WHAT IS A SAMPLE?

The word *sample* is derived from the Old French word *essample*, from the Latin word *eximere*, which means "to take out". Thus a sample is a part taken out, i.e. extracted, from a whole.

WHAT IS A REPRESENTATIVE SAMPLE?

A representative is a part selected to stand for the character of the whole.

For example, all members (parts) of a whole group may present themselves to each other to select one member who is a consensus choice. This consensus member is then presented again, or "re-presented" to the world as a simplified part whose character stands for the whole.

The important thing about a representative sample selected for analysis is to maximize the chances that a "true" consensus average is selected to represent the whole. Applying statistics to reduce the variability of the sample from the "true" average does this.

Sources of variability include: high ratio of sample differences to final representative sample, extremes in characters of samples (extreme ranges of sample values), biases in selection of samples (non-random selection) The chance that the representative sample is statistically "average" is lower as variability of samples rises.

How do we lessen variability? Random sample selection is very important. For example, pick grape samples by location and not by color, ease of removal, etc. Secondly, if more samples from more locations in the whole are combined into a homogeneous mixture, the greater the chances are that the sample mixture is a "true" average.

The initial samples can be homogenized together to get an average sample. If we then randomly select several parts from this mixture and mix them

homogeneously again, we have reduced the size of the sample while still greatly preserving the chances that new mix still represents a "true" average.

Our grape sampling tries to do this by selecting bunches from many locations, mixing them well, and selecting several small parts of this mixture to test.

An analogy would be: Step 1) Have 5000 people from 5000 equally populous districts in China select five numbers out of a pool of fifty numbers; Step 2) Throw the 25,000 selected numbers in a tumbler and select 500 numbers; Step 3) throw these numbers in a smaller tumbler and select 50 numbers; throw these in a smaller tumbler and select 5 as a lottery winner. The chance that the final 5 numbers selected are the five most common, or average, numbers chosen by the 5000 people is very good.

Now, we are not trying to collect perfectly representative samples in the vineyard for a quick test. But we still can strive to get the most representative or truest average sample possible without undue labor. The principle is the same as above. Select several samples from several parts of the crop concerned and select them from several locations with respect to the center of the vine. Mix all these samples, and select a small part of that mix to obtain sample readings.

Representative Grape Sampling for Harvest Decision

1. THE MOST IMPORTANT STEP, READ CAREFULLY: Sample from the whole area to be harvested for a single batch of wine by **representatively (Do not look at condition of grape bunch, just select by**

representative vine locations) selecting grape **bunch samples** to test.

Map out the sample numbers onto the pattern of randomly selected vines ***(see sampling locations on vine and then select random vines on vineyard map, below)***. For example, randomly select 15 vines, located in 15 different places in the total area to be picked, then select 15 clusters of grapes, one from each vine, so that each bunch from each vine will come from a different one of the 15 different branch locations with respect to the trunk and to outer or inner location in vine canopy. Thus, each bunch comes from a different vine, a different vine location in the vineyard, and a different location with respect to the trunk and to sunlight exposure.

2. Separate all of the grapes from the stems. With a small crusher or with your clean hands, thoroughly crush all of the grapes into a container. Separate the juice from the pulp and skins with a strainer and cheesecloth into another container.

3. Spin to clarify or leave in refrigerator several hours or overnight. Remove clarified juice with a pipet to another container. Use clarified juice for samples

4. Stir clarified juice to homogenize. Remove samples for Brix, pH, titratable acid, and yeast available nitrogen (YAN) tests. Do each test. Repeat with a second sample. Repeat with a third sample.

5. Average the test readings from the three samples to get final representative readings. Compare readings to those desired by winemaker, and report to winemaker if they are close to desired. The winemaker should then repeat the tests, and in addition do tests for sensory evaluation before the decision to harvest is mutually agreed upon.

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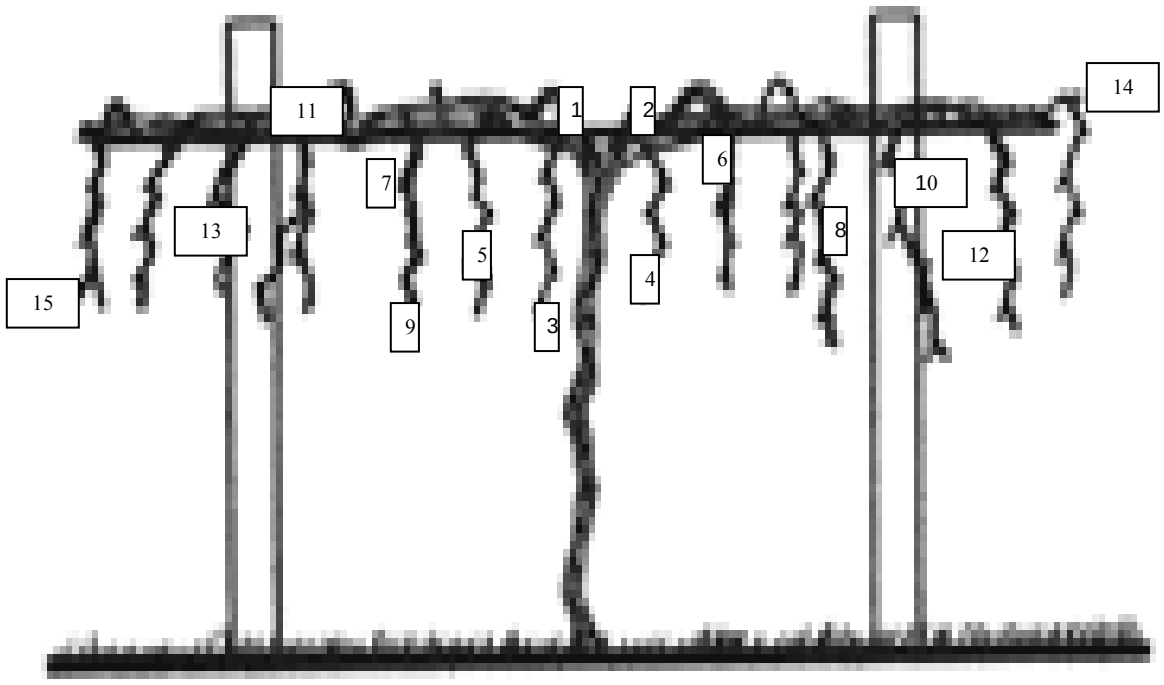

15 Sampling Locations, Sampled Over Fifteen Different Grapevines

1	26	51	76	101	126
2	27	52	77	102	127
3	28	53	78	103	128
4	29	54	79	104	129
5	30	55	80	105	130
6	31	56	81	106	131
7	32	57	82	107	132
8	33	58	83	108	133
9	34	59	84	109	134
10	35	60	85	110	135
11	36	61	86	111	136
12	37	62	87	112	137
13	38	63	88	113	138
14	39	64	89	114	139
15	40	65	90	115	140
16	41	66	91	116	141
17	42	67	92	117	142
18	43	68	93	118	143
19	44	69	94	119	144
20	45	70	95	120	145
21	46	71	96	121	146
22	47	72	97	122	147
23	48	73	98	123	148
24	49	74	99	124	149
25	50	75	100	125	150

Example of Numbered Plants in Vineyard for Random Sampling, (Edge Plants Usually Excluded)

Use Random Number Table for Choosing 15 plants to be sampled

EX: If you have 1000 plants in your sample area, generate a random number table from 1-1000

A website that will generate random number tables of any size is located at http://www.graphpad.com/quickcalcs/randomN1.cfm