PRESQUE ISLE WINE CELLARS

"Serving the Winemaker Since 1964"

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ACID REDUCTION USING CALCIUM CARBONATE WITH OPTIMAL TARTARIC ACID RETENTION

Calcium carbonate will react with both tartaric and malic acids when used to reduce acidity in grape wines, but it reacts more rapidly with tartaric acid. It is desirable to retain as much tartaric acid as possible because it is more stable and because it buffers to a lower pH level.

A 'double salts method' was in vogue several years ago to accomplish the above, but the process was difficult to carry out properly and the reagents aren't readily available any more. We outline below a very simple method which accomplishes most of what the 'double salts method' did and additionally has less chance of a bad result.

1. Calcium carbonate will reduce titratable acidity (calculated as tartaric acid equivalent) at the rate of **2.4 grams per gallon will reduce acidity by 0.1%**.

2. We offer the caveat that you have to be careful and must do bench tests if you plan to drop acidity more than about 0.2% because of the risks of getting the pH too high and picking up a `salty metallic' character in the wine.

3. When you determine how much calcium carbonate you will use on the batch to be treated, record that amount. (For example, say you have 55 gallons of wine and want to drop the acidity by 0.1% you calculate as follows: 55 [volume to be treated] x 0.1 [percent of acidity to be reduced] x 10 [number of tenths of a percent to be dropped] x 2.4 [amount to reduce one gallon by 0.1%] = 132 grams. If you wish to reduce the acidity by 0.15% then the formula would be 55 gallons x 0.15 x 10 x 2.4 = 198 grams.

4. Once you have determined the total amount of calcium carbonate to use, you need to calculate how much of the batch you need to supply so the carbonates reduce all of the acidity in that fraction. As an example, if the titratable acidity of the wine (or juice) is 1.2% (parts per hundred) then you calculate the grams of calcium carbonate needed to neutralize all of the acidity in a gallon. The calculation would be 1.2 x 10 x 2.4 = 28.8 grams of calcium carbonate needed to neutralize all of the acid in a gallon. If the acidity was 0.9% titratable acidity the calculation would be 0.9 x 10 x 2.4 = 21.6 grams of calcium carbonate needed to neutralize the acid in one gallon.

5. The number of gallons needed to add the calcium carbonate to is the number of grams of acid for the entire batch divided by the number of grams needed to neutralize one gallon. 132 grams/21.6 grams per gallon = 6.11 gallons

6. Add the calcium carbonate to the wine to be treated being careful to have enough room to handle the flare up of foam which will occur. Don't be concerned with what happens to the color of the treated wine; it may look awful, but will be fine when it is added back to the rest of the batch. After thirty (30) minutes the treated batch should be added back to the remainder.

7. The wine should be cold stabilized at some point after treatment to reduce the risk of calcium malate or potassium tartrate crystals in the bottled wine.

8. Calcium ions may affect the flavor of the wine for several months after the treatment so don't use it close to the time the wine will be consumed.

SUMMARY OF CALCULATIONS:

1. Number of grams of calcium carbonated needed = **size of batch in gallons x percent drop in acidity desired x 10 x 2.4**

2. Number of grams of calcium carbonate needed to completely neutralize the acid in one gallon of wine at different acidity levels = **Percent of titrable acidity x 10 x 2.4.**

Titratable Acidity	Grams $CaCO_3$ Needed/Gal	Titratable Acidity	Grams $CaCO_3$ Needed/Gal
0.80	**19.2**	**1.25**	**30.0**
0.85	**20.4**	**1.30**	**31.2**
0.90	**21.6**	**1.35**	**32.4**
0.95	**22.8**	**1.40**	**33.6**
1.00	**24.0**	**1.45**	**34.8**
1.05	**25.2**	**1.50**	**36.0**
1.10	**26.4**	**1.55**	**37.2**
1.15	**27.6**	**1.60**	**38.4**
1.20	**28.8**	**1.65**	**39.6**

3. Number of gallons of wine needed to get total neutralization of the acids =

Number of grams for total batch/number of grams needed for one gallon = number of gallons of wine needed to achieve total neutralization of acidity.