

# *Brehm*

# *Vineyards*

P.O. Box 6239, Albany, California 94706

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Tel: 510-527-3675 ~ Fax: 510-526-1372 ~ grapes@brehmvineyards.com

## *Making Fine Wine From Frozen Grapes*

### *Receiving Your Grapes*

It has been our experience over the years that occasionally a pail of frozen grapes will slightly implode during the defrosting cycle causing the pail to appear dented. There is nothing wrong with the pail or the grapes within; it is the natural consequence of the ice thawing. However, you should not leave these pails upside down.

Swollen pails, pails venting CO<sub>2</sub>, leaking pails (probably not usable), and any other serious conditions as a result of the shipment of the grapes should be received from the transport agent “with exception” to the specific condition. You should write a detailed description of the condition and have the driver, or agent write their name, date, and recognition of the condition on the bill of lading or air waybill BEFORE you leave with the pails. Please notify your supplier, or Brehm Vineyards immediately of the problem.

### *How to Thaw Your Grapes*

Depending on the method used to ship you the grapes you will need to let the pails of grapes thaw for 1-3 days. It is important that you thaw your grapes in an environment at a constant temperature. You want to thaw the grapes quickly and evenly. Room temperature, 70°F / 21°C, is ideal for thawing, as well as for conducting the primary sugar fermentation.

Under no circumstances should you let your grapes thaw slowly in a refrigerated environment. If you let the grapes thaw out slowly, you greatly increase your chance of allowing a bacteria, fungi or mold from taking hold and contaminating your grape must.

Your goal is to thaw your grapes quickly and evenly so that the grapes get to proper fermentation temperature as soon as possible. Once you add your yeast and the primary sugar fermentation begins, the bubbling CO<sub>2</sub> released as a by-product of the sugar to alcohol fermentation acts as a natural barrier against bacteria, fungi or molds. Take advantage of this CO<sub>2</sub> barrier by keeping the fermenting must always covered while in an open fermentor, or always sealed with a fermentation airlock when in carboys.

When you receive your grapes, take the lids off and inspect the grapes for any freezer burned or moldy grapes. Remove any grapes that are questionable. Make sure your hands are clean and then go ahead and mix the grapes in the bucket thoroughly. If the must is completely thawed, you will be able to move the entire must around. The temperature of the must might still be cold. Stirring the grape must will help speed the thawing process.

Once your pails of grapes are completely thawed, pour the contents of each pail into your fermentor. Make sure that you scrape out everything that remains in the pail, especially the syrupy ‘stuff’ at the bottom (which is a combination of sugars and cream of tartar that settle on the bottom of the pail during the freezing / thawing process). Add this to the fermentor. Take a cup and add a half-gallon of must back into the shipping pail. Swirl the must in the pail until the pail is clean. Your goal is to dissolve any acids and sugar residue into the must and juice. Add all must from the shipping pails back into the fermentor. Now mix the must together thoroughly

Cover your fermentor so that no contaminants can fall into the must. The cover should not be air tight as to allow the CO<sub>2</sub> to leak out.

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## **An educational aside:**

*The freezing and thawing of juice (to a lesser degree in the crushed grapes than juice) efficiently separates and concentrates the principal components of the grapes. You may recall that ice burgs are made of ice without salt. As water freezes, sugars and acids are concentrated by density. Grape's principal acid is 'tartaric', which decreases in solubility with a decrease in temperature and/or an increase in alcohol, producing cream of tartar. You can adjust the amount of sugar and the amount of tartaric acid of almost any juice by freezing.*

## **IMPORTANT - NOTICE:**

All frozen pails have labels indicating the sugar readings on the pails. Before the Red grapes were harvested, a sample was taken in the vineyard. The vineyards cover many acres, and may be quite hilly. The particular buckets you have are from a few vines and may be higher in sugar than this average vineyard sugar. Low sugar is much more rare.

MAKE SURE that the must is extremely well mixed. Test the sugar of your must. If your sugar reading is above 25° brix, you will need to add water and tartaric acid. This is normal for many California grapes that are harvested for phenolic maturity. Must rehydration is practiced by the finest wineries in California.

## **Adding Acidulated Water for Sugar Dilution (Rehydration)**

High brix levels can pose problems during primary fermentation and secondary fermentation. Stuck primary fermentations are common because many yeast strains are inhibited at high alcohol levels. These conditions can cause wines with residual sugars of between 1-4%. High alcohol (high sugar) levels do inhibit malolactic (secondary) fermentation.

It is a common practice in California wineries, and for the home winemaker, to add water to the high sugar grape must or juice prior to primary fermentation. The idea is to dilute the brix down to a more manageable level of about 24.5° brix.

If you simply add water to your must or juice, you will not only dilute your sugar concentration, you will also dilute your total acidity. For this reason, unless the must/juice already has excessive acid, it is important to use water that is acidulated with tartaric acid to perform your dilution. The acidulated water will not only dilute the sugar concentration, but it will keep your total acidity and pH constant.

The common practice is to add 7 grams (or 1/4 ounce) of tartaric acid to 1 liter of distilled water to make up your acidulated water dilution solution. (This solution is equivalent to a total acidity of 0.70 g/100 ml or 7 g/L.) This solution of tartaric acid will be used to dilute your high sugar must or juice. (Note: You may need more than 1 liter of acidulated water. See below on how to determine the amount of acidulated water you will need for your volume of wine.)

The most common mistake made is adding acidulated water based on the volume of your must – crushed grapes, not your final volume of the pressed, finished wine. You must first determine how much finished wine you will produce before you dilute your must or juice. The same principle holds when adding sugar to chapitalize must or juice. For white grape juice, your yield is roughly the same as your starting volume. In general, for red grape musts, the yield is 3-1/3 gallons finished, pressed wine per 5 U.S. gallons of fermented must. This will vary based on the skin to juice ratio. Bordeaux varietals average a little over 3 U.S. gallons finished, pressed wine per 5 U.S. gallons of fermented

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must. Rhone varietals average close to 3-1/2 U.S. gallons of finished, pressed wine per 5 U.S. gallons of fermented must.

There are two ways of approaching the rehydration of the must. California wineries use a rule of thumb of adding 7 gallons (26.5 liters) of water/ton of grapes to lower the brix one (1°) degree. The water addition all goes to the final wine.

Note: 3 U.S. gallons is equivalent to 11.4 liters. Since we are measuring total acidity in metric units, it is important to convert your volume units from the English system to the Metric system. (Note: 28 grams = 1 ounce).

Another method that may be conducted incrementally and checked by hydrometer/refractometer is done algebraically.

In general, the formula is as follows:

Let:

O = Original Brix of must or Juice

L1 = volume (in liters) of finished wine from undiluted must/juice

B = Brix you want to dilute must/juice to

L2 = volume (in liters) of finished wine from diluted must/juice

Y = volume (in liters) of acidulated water to add to must or juice to dilute to desired level, B.

Equation 1:  $(L1) \times (O) / (B) = (L2)$

Equation 2:  $(L2) - (L1) = Y$

For Example : We have 5 U.S. gallons of red must at a brix of 26.5°. How much acidulated water do you add to lower the brix to 24.5°?

O = 26.5,

L1 = 11.4 liters (5 U.S. gallons of red must = 3 gallons finished wine)

B = 24.5

L2 = Do equation 1 to determine L2

Y = Do equation 2 to determine Y

$(11.4 \text{ liters}) \times (26.5 \text{ brix}) / (24.5 \text{ brix}) = L2$

L2 = 12.28 liters

$(12.28 \text{ liters}) - (11.4 \text{ liters}) = Y$

Y = 0.88 liters

Therefore, we must add 0.88 liters of acidulated water to our 5 U.S. gallons of red grape must to dilute the brix down to 24.5 brix.

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## **Adding Tartaric Acid to Adjust Total Acidity**

Adding tartaric acid to water for brix dilutions allows you to dilute the brix of juice or must without affecting the total acidity. When you have juice or must that is low in total acidity, you can add tartaric acid directly to the must/juice or wine to raise the total acidity and therefore lower the pH. Do not add acid blend, citric or malic acid.

In general: 1 gram of tartaric acid added to 1 liter of liquid (must/juice/wine) will raise the total acidity of that liquid by 0.10%. This is equivalent to 3.8 grams per U.S. gallon raises the TA by 0.10% in one U.S. gallon.

Example #1:

If you have 11.4 liters of juice/must/wine at 0.60 Total Acidity and you want to raise the Total Acidity by 0.10% to 0.70, how much tartaric acid will you need to add?

$(11.4 \text{ liters}) \times (1 \text{ gram Tartaric Acid} / \text{liter}) = 11.4 \text{ grams of tartaric acid to raise the TA of the wine by } 0.10\%.$  (Note: 28 grams = 1 ounce)

Example #2:

If you have 255 liters of juice/must/wine at 0.50 Total Acidity and you want to raise the Total Acidity by 0.20% to 0.70 you will need to add:

$(255 \text{ liters}) \times (1 \text{ g Tartaric Acid} / \text{liter}) = 255 \text{ grams of tartaric acid to raise the Total Acidity by } 0.10\%.$

$(255 \text{ grams}) \times 2 = 510 \text{ grams of tartaric acid to raise the Total Acidity by } 0.20\%$

Note: When adding tartaric acid directly to young wine or fermenting juice, be aware that the acid granules will release dissolved CO<sub>2</sub>. If adding tartaric acid to a full carboy of wine, it is best to remove some of the wine before adding the tartaric acid. Dissolve your tartaric acid in either some of the juice you are fermenting or in some distilled water. Allow the bubbling to subside before adding the wine back to the carboy to top it up.