



## *Restarting Stuck and Sluggish Fermentations*

The following is a basic method for restarting a fermentation which is stuck at 5 Brix or less. At the conclusion, there is a discussion of how one can modify or supplement this approach depending on the specific situation or preferences of the winemaker. Please consult with Gusmer Analytical Services for lab services, products and any further information relating to your fermentation needs.

### **Prepare a “Starter”**

A Starter must be created which will build a large and strong yeast population prior to its introduction into the stuck wine. The Starter must be nutrient rich and have adequate sugar. There are several ways to design this Starter but the following parameters should be observed:

- ◇ The volume of the Starter should be 2 – 5% of the volume of the stuck wine. That is, 20 to 50 gallons of Starter is required for 1,000 gallons of stuck wine.
- ◇ The Starter should be made from a combination of water, fresh grape juice, and stuck wine (with the stuck wine representing no more than ½ the volume of the Starter).
- ◇ The Starter then should be adjusted to about 5 Brix with either concentrate or sugar. If you used fresh grape juice to make your Starter, your Brix may already be higher and that is not a problem. Fresh grape juice is probably the best ingredient for the Starter and can be sourced from another lot of grapes, prior frozen grapes, or table grapes from the grocery.
- ◇ Nutrients should be added based on the volume of the Starter not the stuck wine when Brix are below 5. Use MicroEssentials Prime at a rate of 4 lbs/1,000 gallons (1.8 g/gal) of Starter.
- ◇ Bear in mind that the Starter’s temperature will need to be about 75 – 80°F when the inoculation procedure (below) begins.

### **Rehydrate the Yeast**

Select a different yeast than those which have previously failed in the stuck lot. There are many yeast brands on the market which are considered strong fermenters and often these are Bayanus forms of *Saccharomyces cerevisiae*. We recommend Merit which is not a Bayanus form but has shown that it performs well in high alcohol, fructose-only fermentations.

- ◇ Use yeast at the rate of approximately 5 lbs/1,000 gallons (2.25 g/gal) of stuck wine.
- ◇ Re-hydrate yeast in accordance with manufacturer’s specifications. Generally, this will mean stirring the yeast gently into a 10:1 volume of water (1 liter of water per 1 KG of yeast) at about 100°F.
- ◇ The rehydration water should be supplemented with 0.5 lb/gallon of MicroEssentials Prime. Note that the water should be chlorine free.
- ◇ Wait about 15 minutes to see the typical frothing activity from the hydrated yeast, and then proceed immediately to the next step.

### **Add the Hydrated Yeast to the Starter**

- ◇ It is critically important that the Starter be within 10°F of the Hydrated Yeast. If not, add small amounts of the Starter to the Hydrated Yeast first.
- ◇ Once the temperatures are nearly the same, add all the Hydrated Yeast into the Starter



## Meter the Stuck Wine into the Starter

The yeast will begin building a strong population quickly in the friendly environment of the Starter. Monitor the Brix of the Starter with a hydrometer. When the Brix have dropped by half (to about 2.5 Brix), then the yeast are ready to take on the stuck wine in slow increments.

- ◇ Begin by adding a volume of stuck wine equal to the volume of the starter. Once again, temperature acclimation is critical. If the stuck wine and starter are more than 10°F apart, incrementally add small amounts of stuck wine in order to equilibrate the temperatures. Note also that your goal is to keep the fermentation running in the range of 65-75°F.
- ◇ After each addition, wait for a sign of renewed fermentation activity (either by hydrometer or just visually) and then double the volume again by adding more stuck wine. All the stuck wine is eventually metered into the fermentation in this manner.

## Important Issues to Consider

- ◇ The Starter used in the above method is obviously dilutive to your wine. That is, you are adding some combination of water, sugar, fresh grape juice and concentrate to your wine. If that is not appealing, you may attempt the restart with a smaller Starter, or with no Starter at all – just slowly meter in the stuck wine to the hydrated yeast. This approach will be more viable if you have significant amounts of sugar left in your stuck wine. However, your chances of success will be a function of how “difficult” your stuck fermentation is. The factors influencing the degree of difficulty are discussed below.
- ◇ It is important to try to determine the cause(s) of the stuck fermentation, because remedial action may be required. In particular, many problem fermentations today are caused by Lactic Acid Bacteria generating excess amount of acetic acid (Volatile Acidity). If your fermentation becomes sluggish or stopped, we strongly advise that you investigate this issue. A microscopic exam for Lactic Acid Bacteria and a measurement of VA will quickly determine if treatment is required. If so, Lysozyme is strongly recommended. If you are unable to get this lab work done quickly, you can choose to lower your risk by immediately proceeding with the Lysozyme treatment at 250-350 ppm. VA levels of over 0.8 g/100mls will likely prevent further fermentation – reduction of VA through reverse osmosis or spinning cone is required.
- ◇ Many stuck fermentation protocols begin with a recommendation to add 20-25 ppm of SO<sub>2</sub> to the stuck wine to maintain microbial inhibition prior to the restart. Yeast hulls, followed by filtration, are also often recommended to help clean up the wine. The winemaker may use his judgment on these, again depending on the circumstances. For example, if microbial activity is what stopped the fermentation, then we recommend that you proceed with these steps.
- ◇ High alcohol levels are also a major cause of stuck fermentations today. Alcohol levels over 16% will be very difficult to re-start. This is especially true if significant sugar remains which will push the alcohol even higher. Alcohol reduction by reverse osmosis, or the use of a significantly larger, more dilutive Starter will likely be required.

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