TO STERILIZE OR JUST CLEAN

by

Lum Eisenman

Professional winemakers wash their grape receivers and crushers before any grapes are processed. The pros make sure everything is clean, but they seldom attempt to sterilize their crush equipment.

On the other hand, home winemaking literature is filled with statements such as "...first, assemble all the winemaking equipment and sterilize with a sulfite solution....." Have you ever wondered why the pros seem so indifferent about sterilizing their equipment? On average, one ton of California wine grapes contains seven pounds of dirt, one mouse nest, 147 bees, 98 wasps, 1,014 earwigs, 1,833 ants, 10,899 leafhoppers and three pounds of bird droppings. In addition, the waxy coating on grape skins contains many microorganisms. Grapes are crushed without washing, so crushed grapes contain several non-grape substances and many microorganisms. Consequently, attempting to sterilize crush equipment seems a bit futile. The nitrogen (bird droppings) and protein materials (bugs) are consumed during fermentation by the yeast. When fermentation is complete, the dirt, bees wings, earwig tails, etc. settle to the bottom of the fermenter, and much of the yeast and ugly stuff is left behind when wine is racked.

Grape juice is a hostile environment to most microbes because of the low pH, high sugar level and high phenolic content. After fermentation, the alcohol content is also high, so wine is even less hospitable to microbes than juice. Thousands of different types of microbes are not waiting to contaminate wine. In fact, only a few yeasts and a few bacteria can grow and reproduce in wine.

The yeasts found in wine are primarily Saccharomyces (sugar loving). These are the sugar fermenting yeasts and include several popular strains of Saccharomyces cerevisiae such as Montrachet, Epernay II, Pasteur Red, etc. Other fermentation yeasts include the more alcohol tolerant Saccharomyces bayanus strains, such as Prise de Mousse and Pasteur Champagne. Only a few other yeasts including Schizo saccharomyces, Brettanomyces, Mycoderma and Flor yeast (film yeast) grow in wine, and these yeasts are wine spoilage yeasts.

Wine bacteria are mostly limited to two major groups. Lactic acid bacteria belonging to the Lactobacillus, Leuconostoc and Pediococcus genera convert malic acid into lactic acid. Many of these lactic bacteria can also convert sugar directly into acetic acid. However, the lactic bacteria are very sensitive to sulfur dioxide, so these bacteria are relatively easy to control.

The second group of wine bacteria is the vinegar bacteria. These microbes convert ethyl alcohol into vinegar, and vinegar bacteria are one of the primary wine spoilage organisms. Unfortunately, vinegar bacteria are not very sensitive to sulfur dioxide. However, vinegar bacteria require much oxygen to convert alcohol into vinegar, so restricting oxygen can control them. This is why wine is stored in sealed containers, and the containers are always kept full to eliminate air and prevent vinegar formation.

None of the molds grow directly in wine. However, molds can grow in dilute wine solutions, so hoses, pumps and tanks must be washed carefully to avoid mold contamination.

The French scientist Louis Pasteur observed that only a few types of microorganisms and no disease producing bacteria (pathogens) could grow in wine, and he wrote ".... wine is one of the most healthful and hygienic of beverages ...." His comment may seem a bit paradoxical since wine starts out as a grossly contaminated liquid. However, the action of the yeast makes wine an unusually pure beverage.