Vine to Wine | September 2017

Interactions between *Brettanomyces* and *Oenococcus oeni*

Dr. James Osborne, Associate Professor and Enology Extension Specialist, Dept. Food Science & Technology, OSU

In some ways, being a microbe during the winemaking process is a lot like working in a large company where you interact with many different people. Some people you get along with great, some people you tolerate but would rather not interact with, while some people seem to be actively preventing you from doing your job well. In the Osborne lab these interactions between microbes during winemaking are being studied. The goal is to understand how these interactions could be harnessed to encourage the growth of desirable microbes while minimizing the growth of spoilage microbes. One such study is investigating interactions between the major wine spoilage yeast, *Brettanomyces bruxellensis*, and *Oenococcus oeni*, the bacteria commonly used to conduct the malolactic fermentation (MLF). *B. bruxellensis* causes wine spoilage through the production of horsy or barnyard-like smelling volatile compounds. This spoilage occurs typically during the aging of wine but can also occur at other stages of winemaking. During and shortly after MLF wine is particularly susceptible to *Brettanomyces* spoilage since sulfur dioxide (SO_2), the main tool used to prevent *Brettanomyces* growth, cannot be added until MLF is complete. Because of this, it is recommended to conduct a rapid MLF with inoculated cultures so that the time that the wine is without SO_2 protection is minimized. An additional reason why performing a rapid MLF may aid in preventing *Brettanomyces* spoilage is being studied in our lab. During experiments with *Brettanomyces* it was noted that the yeast often struggled to grow in wine that had recently undergone MLF. Further investigation showed that the presence of *O. oeni* at the end of MLF was causing the *Brettanomyces* inhibition. The length of time that this inhibition lasted was related to how long high populations of live *O. oeni* remained in the wine. When *O. oeni* populations in wine were relatively high, *Brettanomyces* populations declined rapidly after inoculation. On the other hand, when *O. oeni* populations in the wine declined, *Brettanomyces* was able to grow. Strain differences were noted and are likely due to how long each *O. oeni* strain persisted in the wines post-MLF. For example, one *O. oeni* strain died off quickly after MLF and *Brettanomyces* grew well in those wines. In contrast, a different *O. oeni* strain persisted at high populations for more than 50 days post-MLF and *Brettanomyces* did not grow in those wines. Additional *Brettanomyces* strains are currently being tested to determine how sensitive these yeasts are to the presence of *O. oeni*. Further experiments are also being conducted to determine the mechanism by which this inhibition occurs. While winemakers must continue to use sound winemaking practices such as appropriate SO_2 and pH management and rigorous sanitation to prevent the growth of *Brettanomyces* in their wines, this work has shown that the presence of high populations of *O. oeni* at the end of MLF may offer some limited protection for the wine until SO_2 can be added.