Foam stability in sparkling wines

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Pouring a glass of sparkling wine only to find the wine turns quickly into still wine is a big disappointment. Aside from glass type and serving temperature, every decision made at each step of sparkling wine production can influence foam and height stability. Since 2013, the CCOVI has focused on studying sparkling wine production and how the final sparkling wine foam and flavor can be affected by winemaking decisions. It is important to remember that foam height refers to the wine’s ability to form stable foam, whereas foam stability time is the time the bubbles take to completely dissipate. It is well documented in published studies that the main tensioactive compounds involved in foam stability are grape and yeast proteins. Techniques that reduce or remove these compounds can decrease or increase foam stability depending on the treatment.

It is important to consider foam stability from the moment the grapes are harvested and throughout sparkling wine production. Ideally, the aim is to achieve a steady stream of foam and sustained collar for the duration of the time the wine is in the glass.

A common mistake winemakers make when they first start a sparkling wine program is to make the base wine as they would a still wine. Our current research is showing that the chemical composition of different grape varieties affects foam stability particularly the amount of tartaric acid, which has a positive effect on foaming and stability. Our press fraction study revealed that the first press fraction (without free run juice) had far superior foam height and stability than the other fractions. Base wine destined for sparkling should not undergo bentonite fining before the secondary fermentation to prevent grape protein removal. Grape proteins are an important factor in foam stability. The use of sodium bentonite in sparkling winemaking has been well documented, our trials found that when juice was fined with sodium bentonite prior to the first fermentation and used as a riddling agent at bottling, the resultant sparkling wines had far less foam height and stability than wines without any bentonite. A balance must be considered between possible bentonite use and foam response. Low turbidity of the base wine can be achieved by appropriate settling of the juice, accurate racking of the juice/base wine and the correct filtration. Phenolic compounds can have a negative effect on foam stability. Higher alcohol levels have been found to have a negative effect on foam.

The temperature of the secondary fermentation and cellar storage impact the type of yeast lees and the ease of riddling. It is much easier to riddle wines that have had long lees aging and were fermented and stored at 12°C with a tiny amount of riddling agent than at 16°C. A detrimental effect on sparkling wine foam occurs if too much of a riddling agent is added at bottling, it reduces foamability by removing tensioactive compounds. Similarly, too much sugar added to the base wine at bottling increases the likelihood of wine loss and gushing at disgorging due to the high pressure in the final bottles. This can also cause bottle variation. The type of wine used in the dosage has an impact on foam. Our dosage study revealed that sparkling wines with a dosage made from the oldest sparkling wines in the cellar had increased
foam stability and flavour complexity. These wines showed better than those produced from oaked still wines.

For more information, see Belinda Kemp’s paper *Effect of Production Phase on Bottle-Fermented Sparkling Wine Quality*. A link to this article can be found on our website www.scottlab.com