5 Targeting leaf removal to achieve specific flavors and aromas

Justine Vanden Heuvel et al.

Department of Horticultural Sciences, Cornell University

• The goal of this study was two-fold: 1) to determine the natural dynamics of methoxypyrazines during berry ripening , and 2) to determine how *timing* and *severity* of leaf removal affected methoxypyrazine levels and the sensory profile of the resulting wines. The ultimate goal was to be able to make recommendations on *whether*, *when* and-or *how much* leaf removal to perform to achieve a desired wine style.

• The authors worked with two varieties: **Cabernet Franc** (Ovid, NY/Finger Lakes) in 2007 and 2008, and **Merlot** (Long Island) in 2008. They compared 3 timings and 3 severities of leaf removal, as follows:

Timings	***Severities***
• berry set	• untreated
• 30 days after bloom	• 50% leaf removal
• 50 days after bloom	• 100% leaf removal (= all leaves removed on both sides from 5 basal nodes)

Fruit was analyzed for *methoxypyrazines* on four dates (berry set, 35 days post-bloom, 55 days post-bloom, and harvest), except in Merlot which was analyzed only at harvest. The authors originally intended to include *phenolic compounds* in the analysis, but ran out of funds.

• **Results**:
1) Leaf removal tended to increase Brix and decreased titratable acidity in Cabernet Franc compared to the control, as expected from the increased light exposure. The earlier and the more severe the leaf removal, the greater the above effects;
2) Leaf removal resulted in lower methoxypyrazines *at harvest* in Cabernet franc than the control, both pre-veraison and at harvest. The earlier the leaf removal (berry set, followed by 30 days post-bloom) and the more severe (100%), the lower the level of methoxypyrazines;
3) While all of the above was observed in 2007, leaf removal had no impact on juice parameters or methoxypyrazine levels in 2008, which the authors attribute to the good weather in 2007;
4) While timing and severity of leaf removal showed the above effects in Cabernet Franc, modulating these parameters had no response in Merlot - all leaf removal treatments performed on Merlot had lower methoxypyrazine levels than the control, regardles of timing or severity.
5) An informal tasting of the 2007 Cabernet Franc wines showed that all the leaf removal treatments had considerably less green character than the control wine. A formal descriptive analysis is pending.

So why did leaf removal reduce methoxypyrazines one year and not the other? Why in Cabernet Franc and not Merlot? The researchers plan to continue this study in search for these answers. In the meantime, they were able to conclude that **early leaf removal is likely a beneficial practice in poorer seasons to reduce green characters in Bordeaux varieties**. The challenge: detect rather early when the season is going to be "poor vintage."

Author: Bibiana Guerra, Viticulture and Enology Technical Writer, guerra.wineink@gmail.com