

POSTHARVEST IMPACT OF BROWN MARMORATED STINK BUG IN WINE

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Brown marmorated stink bug (BMSB) is an exotic pest believed to have arrived in the USA in the mid-1900s from Asia. As of 2013, it has been detected in 41 states. The pest has caused severe crop damage in the mid-west and on the east coast. In vineyards, it can cause cosmetic damage and lead to secondary pest attack. If harvested with grapes, BMSB contaminates the juice and final wine. It has recently shown its presence in vineyards of the Pacific north-west, threatening the wine industry in Napa, Sonoma and Willamette Valley.

BMSB management techniques are still under development. Chemical control is the current standard technique. However, it shows limited and variable efficacy and can also cause damage to beneficial species. Commercially available traps for detection are not effective until late in the season when the BMSB population has already reached a level that is difficult to control.

Due to these limitations, there is much interest to determine the post-harvest effect of this pest. Recent studies have shown that BMSB releases a taint when stressed or disturbed that impacts wine quality. Our study focuses on evaluating the extent of BMSB's impact on Pinot Noir with the following objectives:

- i. Identify the compounds associated with this taint
- ii. Establish a taint level at which the wine containing this taint is rejected by the consumers (i.e., consumer rejection threshold)
- iii. Identify wine making processes that contribute to this taint

GC-MS analysis of stressed BMSB reveal dodecane, trans-2-octenal, trans-2-decenal, and tetradecane were produced. Of these compounds, only dodecane, trans-2-decenal, and tetradecane were present in the finished wine made from contaminated grapes. Of these three compounds only trans-2-decenal is known to have a strong aroma. Current research focuses on evaluation of the effect of trans-2-decenal to wine quality.

Consumer rejection threshold (CRT) of trans-2-decenal in pinot noir was calculated to be 4.8µg/L. To relate the level of BMSB in grapes with the CRT, we investigated four treatment levels: a) the control (no bug); b) T1 (1 bug per 3 clusters); c) T2 (1 bug per cluster); and d) T3 (3 bugs per cluster). Higher levels of taint were released during destemming and pressing, with heavier presses contributing more taint (e.g., basket versus bladder). T3 produced the most

tainted wine and T1 produced the lowest, as expected. The finished wine showed a measurable amount of trans-2-decenal demonstrating negative impact of BMSB when present during wine making.