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Abstracts (Research Reports)

2010 NATIONAL CONFERENCE TECHNICAL ABSTRACTS CONTINUED

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Empirical Study of Carbon Dioxide Released to the Atmosphere during Commercial Red Grape Fermentation**Steven D. Colome**,* David M. Goldfarb, Marci Norkin, and Geraldine S.P. Ritchie
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Carbon dioxide (CO₂) is a pollutant (greenhouse gas) that is emitted during winemaking but not currently regulated by the Environmental Protection Agency. While winery CO₂ emissions have been modeled, they have never been measured continuously or confirmed during a commercial fermentation. As international interest increases in greenhouse gases, it is important to know the amount of CO₂ release and the determining factors; yeast strain, temperature, and dissolved CO₂ are potentially important parameters. The study was designed to quantify emissions and test a theoretical model for atmospheric release of CO₂ during alcoholic fermentation in a commercial winery. Gas release was channeled through a manifold system with an in-line mass flow meter calibrated for CO₂, providing real-time and integrated measurement of atmospheric emission. Intermittent use of a hot-wire anemometer was used as a check on the mass-flow measurements. Initial results indicate that integrated mass of CO₂ release is dependent on total Brix decrease and not duration of fermentation, consistent with the Williams and Boulton model. However, the time course of release and the shape of the release curves differed substantially among ferments and were primarily dependent on the length of active fermentation.