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ABSTRACTS

The following abstracts are from recent publications and presentations by Oregon State University researchers and graduate students working in viticulture and enology. For more information or reprints contact the authors at OSU.

EFFECT OF CLUSTER EXPOSURE BY DEFOLIATION ON MALATE, TARTRATE, AND POTASSIUM IN BERRIES OF THREE CULTIVARS OF *VITIS VINIFERA*

L. Kerry M. Norton, Porter B. Lombard and David A. Heatherbell

The effects of cluster exposure by basal leaf removal at veraison on the malate, tartrate, and potassium content of grapes were investigated. At veraison, clusters of* Chardonnay grapes were a) exposed to the sun by removal of all leaves opposite or below the clusters, b) treated as in a) but shaded with shadecloth, c) exposed to the sun by tying back leaves opposite or below the clusters, or d) left untreated as a control. Clusters of White Riesling were exposed to the sun by similar leaf removal a) 10 days before veraison, b) 10 days after veraison, or c) untreated. Clusters of Pinot Noir were exposed a) at veraison, b) 2 weeks after veraison, or c) untreated. Exposed clusters received 3 to 3.5 times more light than shaded clusters and up to 32% more heat, with temperature differences between exposed and shaded treatments being most pronounced during cool, sunny weather. None of the treatments had any effect on juice or berry malate, tartrate, or potassium content; however, exposed clusters of Pinot Noir had a lower pH (.03) and higher TA (.06%) than the control at harvest. Cluster exposure of Chardonnay increased sunburning of grapes, and cluster exposure of Pinot Noir at veraison caused a 1% reduction in juice soluble solids concentration at harvest. The detrimental effects of cluster exposure by basal leaf removal at veraison, as well as the lack of any major effect on the acid content of the berries, suggest that the practice has no value for acid reduction during a warm, dry maturation season in western Oregon.
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A RAPID, SIMPLE METHOD FOR THE ESTIMATION OF MALATE AND TARTRATE IN GRAPE JUICE

Kerry M. Norton and David A. Heatherbell

A rapid, simple procedure for the estimation of the malate and tartrate content of grape juice is described. The procedure, which requires only a pH meter for instrumentation, does not directly measure malate and tartrate but instead measures their buffering effect. Samples are titrated between pH 2.70-3.00 and pH 4.50-4.80 and the titrant volumes required are compared to two sets of empirically derived standard curves. The malate and tartrate composition of the sample may be determined by a graphical or

algebraic method. The use of the estimation method, its advantages, and its limitations are illustrated with different viticultural trials. The estimation error (estimated value - measured value) was influenced by many factors including maturity, season, vineyard location, and cultivar. Standard deviations of the estimation error for malate and tartrate were equal to 9% and 15%, respectively, of the mean malate and tartrate concentrations in pooled samples of mature Pinot Noir and Chardonnay grapes grown in different vineyards over a 4 year period. The estimation error is probably due to interference from other buffers present in juice. Although not as accurate as existing analytical methods, the estimation method appears potentially useful for determining relative effects on malate and tartrate of treatments in vineyard trials where analytical equipment is unavailable or for monitoring malate decline during maturation of grapes.
To be presented at the 2nd international Symposium on Cool Climate Viticulture and Enology, Auckland, N.Z. January 12-15, 1988.

ULTRAFILTRATION OF WINE: EFFECT OF ULTRAFILTRATION ON WHITE RIESLING AND GEWURZTRAMINER WINE QUALITY AND STABILITY

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White Riesling (WR) and Gewurztraminer (GEW) wines were ultrafiltered (UF) with Romicon and Millipore pilotscale systems, respectively. The effect of UF, membrane nominal molecular weight cut-off (MWCO) from the 10,000-50,000 daltons, and of volume concentration ratio (VCR) on composition and wine stability was investigated. The effect of 1) pilot-scale UF processing and Bentonite fining on WR and GEW wines, and 2) commercial-scale UF processing on GEW wines was sensorially evaluated by a trained panel using difference testing and descriptive analysis. UF processing reduced color (A_{420}), phenol, and protein. Stability to heat test (HT) was obtainable with MWCO of 10,000 daltons. With increasing VCR (increasing process time) there was a reduction in membrane retention of color (A_{420}), protein, and of HT haze. UF processing of the WR wine significantly decreased the overall intensity, fruity, fresh fruity, citrus, floral, sweet, honey/caramel, and vanilla but it also increased the intensity of vegetative aroma attributes when compared to the control wine. However, when compared to the bentonite-fined wine, the WR UF wine was significantly lower in fruity, floral, vanilla and higher in vegetative aroma intensity. UF processing of the GEW wine significantly decreased intensity of fresh, fruity, and sourness; and increased chemical, ethanol, and acetaldehyde descriptors compared to the control unfiltered GEW wine. However, no significant differences were detected for these descriptors between the bentonite-fined GEW wine and the UF GEW wine except for acetaldehyde which was more intense in the UF GEW wine. Commercial processing of GEW wine by UF significantly decreased only the fresh fruity aroma while increasing the cooked fruit flavor by mouth in comparison with the control wine.
Presented at the 38th Annual Meeting of the American Society for Enology and Viticulture, Anaheim, California. June 25-27, 1987.

ULTRAFILTRATION (UF) OF GRAPE JUICE: EFFECT OF OXIDATION AND OF PRE-UF JUICE TREATMENT ON FLUX, STABILITY, AND COMPOSITION

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Investigations over 3 vintages indicated that grape juice processed without $S0_2$ and clarified by UF

tended to develop sediments upon storage. This study investigates the possible effect of oxidation [processing with or without sulfur dioxide (± $S0_2$)] and of pre-UF treatment of juices with fining agents and enzymes on flux, and on juice stability, color, and composition. White Riesling grape juice was UF with a Romicon Lab 5 pilot scale hollow fiber unit operated in a batch mode with membranes of nominal molecular weight cut-off of 10,000-100,000 daltons. Grapes were processed ± S02 and the effect of treatment of settled press juice with Rahapect VRS Super (VRS, mainly pectinase, includes protease), and of bentonitegelatin-silica sol fining before UF, investigated. Clarified juices were aseptically bottled and stored at 2^o and 20^oC. Juice parameters evaluated included total protein, pectin phenol, color (A_{420}), and stability to heat/cold testing. Pretreatment with enzymes and fining increased flux. The presence of proteins, pectins, and phenolics was detected in sediments. Sediment formation and instability to heat testing of UF permeates processed -SO_2 was prevented with pre-fining. Up to 99% of protein, 99% of pectin, 90% of color, and 20-30% of phenolics were retained by membranes of 10,000 dalton MWCO. However, pre-UF enzyme treatment increased protein and pectin in permeates. Membrane retention of proteins, phenols, pectins, and color decreased with increasing volume concentration ratio (VCR). The effect of VCR on protein fractions in permeates was investigated by electrophoresis techniques.
Presented at the 38th Annual Meeting of the American Society for Enology and Viticulture, Anaheim, California. June 25-27, 1987.

ULTRAFILTRATION OF WHITE RIESLING JUICE: SENSORY EVALUATION OF JUICE PROCESSED WITH AND WITHOUT SULFUR DIOXIDE AND STORED AT 2^o AND 20^oC

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Clarified white riesling juices processed by Ultrafiltration (UF) with S02 (with minimum oxidation) and without $S0_2$ (with oxidation), and stored for 2 months (1985 vintage) and 12 months (1984 vintage) at 2^oC and 20^oC, were evaluated by a trained panel using difference testing and descriptive analysis. The panel was able to distinguish differences among the juices for aroma and flavor by mouth. Of the 22 descriptors evaluated, 11 were significantly different among treatments for the 2-month-old juice, but only six were for the 12-month-old juice. UF processing with minimum oxidation significantly decreased the intensity of vegetative, stem/seed aroma, and astringency attributes. However, UF processing with oxidation increased apple/ apple cider, grape, sweet, honey/caramel, and chemical aroma descriptors but decreased metallic aroma and overall intensity, sour, and stringent flavor by mouth descriptors. UF juices processed with minimum oxidation had lower intensity of aroma (apple/apple cider, sweet, honey/ caramel) and flavor by mouth (apple/apple cider) descriptors than those processed with oxidation. Moreover, juice processed with minimum oxidation and stored for two months (1985 vintage) had significantly higher intensity of grape, chemical, and metallic descriptors, whereas the juice stored for 12 months (1984 vintage) had significantly less overall intensity when compared to those processed with oxidation. Storage at 20^oC in comparison with 2^oC, significantly increased the grape aroma in the 2-month-old juice and the vegetative aroma of both 2- and 12-month-old juices. However, it decreased the apple/apple cider aroma in the 2-month-old juice.
Presented at the 38th Annual Meeting of the American Society for Enology and Viticulture, Anaheim, California. June 25-27, 1987.