

Oregon Wine Advisory Board Research Progress Report

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ABSTRACTS

The following abstracts are taken from papers presented or published during 1986 by OSU wine and grape research personnel. For information on these abstracts, please contact the authors at Oregon State University.

METHODS OF ESTIMATING FRUIT SET ON GEWURZTRAMINER VINES

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Three methods of estimating fruit set are described: Pruning clusters to a set number of flowers, bagging clusters, and measuring flower clusters to determine a length: flower number correlation. They were tested against counted controls on girdled and nongirdled canes of Gewurztraminer vines. Estimates of flower number based on bagging differed from counted controls at $p = .05$; estimates of flower number based on cluster length were not significantly different from the control. Pruning clusters was found to significantly interact with the girdling treatment. Bagging did not effect fruit set, but diurnal temperatures in and out of the bags were significantly different. The percent treatment difference needed for significance at $p = .05$ is listed for each estimate system. Berries/cluster, seeded berries/cluster, and cluster weights were poor estimates of fruit set.

Presented at the annual meeting of the American Society for Enology and Viticulture, June 1986.

APPLICATION OF PROTEASE ENZYMES FOR PROTEIN STABILIZING WINE

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Previous investigations in our laboratory demonstrated an experimental acid fungal protease (Protease-EL, Rohm GmbH) removed heat unstable protein in grape juice and wine at 46°C in 12 hours, but that these proteins were resistant to enzymatic modification/degradation at cellar temperatures. The possibility of rendering proteins more susceptible to enzymatic "degradation" by flash heat treatment of juice (HTST, $93-100^{\circ}\text{C}$, 30-60 secs) before enzyme treatment at cellar temperatures (20°C) was investigated in Muscat Blanc, Gewurztraminer, and White Riesling using Protease-EL and Rohapect VR super (a commercial pectinase containing protease-EL activity). Enzyme treatment of HTST juice reduced the concentration of soluble proteins in the juice by 60-70% except in White Riesling with very low juice protein content. Bentonite required to "protein stabilize" the new wines to heat/cold testing was reduced by 50-70%. Proteins in juice and wine were characterized for molecular weight (MW), iso-

electric points (pl) and glycoproteins (GP). Flash heat treatment primarily removes protein fractions in the MW ranges of 14,000 to 35,000 and 60,000 to 65,000 while increasing the susceptibility of remaining fractions to protease "degradation." However, a low MW (12,600) fraction was not affected by either heat or enzyme treatment.

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HEAT UNSTABLE PROTEINS IN WINES: CHARACTERIZATION AND REMOVAL BY BENTONITE FINING AND ULTRAFILTRATION (UF)

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Gewurztraminer and Riesling wine proteins were characterized for molecular weights (MW), isoelectric points (pl) and glycoproteins (GP) by LDS-PAGE, 2-dimensional IF-LDS electrophoresis, silver staining and protein blotting. Relative concentrations of proteins were determined by laser scanning densitometry. Bentonite fining tends to remove higher pl (5.8-8.0) proteins first, however it is necessary to remove the lower pl (4.1-5.8), lower MW (11,200-25,000) proteins and GP to "protein stabilize" wines to heat/cold testing (HCT). Unstable proteins precipitated by HCT were recovered and analyzed. These proteins were mainly low MW proteins and primarily GP. However, one low MW fraction (12,600) containing GP was not precipitated by HCT. Wines were ultra-filtered with Romicon & Millipore systems operated with membranes of 11 nominal MW cut-off (MWCO) of 10,000-50,000. Up to 99% of the protein was retained with membranes of 10,000 MWCO. "Protein stability" could be obtained with MWCO of 10,000. However, a low MW (12,600) fraction is not removed by UF and contributes to residual "protein instability" in some wines. Protein stabilization of wines by UF is similar to that by bentonite fining in that it is necessary to remove the lower MW, lower pl fractions and the GP to "protein stabilize" wines.

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PINOT NOIR CLONAL RESEARCH AT OREGON STATE UNIVERSITY

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In 1979 a Pinot noir clonal trial plot was planted in a commercial Willamette Valley vineyard as a cooperative venture of the Oregon Winegrowers Association and OSU, using clones from U.C. Davis and France. Our research goal is to provide growers with the information they need to choose an appropriate clone for a given trellis, production level and wine type, rather than defining an ideal clone. Yield, plant growth, maturity data have been collected for three years. Differences have been observed between clones in plant habit, cluster morphology, yield, and maturity. Two French clones, Espiguettes 374 & 236, have large clusters and yields; Esp. 374 also has an upright growth habit. Cluster types ranged from small and tight to very loose with cluster wts. from 41-105 g. In 1985, yields ranged from 1.1 kg/vine for UCD-17 to 4.46 kg/vine for Esp. 236; yield efficiency (yield/pruning weights) ranged from 0.69 kg/kg for UCD-17 to 4.66 kg/kg for UCD2-A. A new plot of Pinot noir will be planted in a different site in 1987 using selected clones from this trial and new introductions from Dijon, France. New clones are being distributed through the Oregon grape certification program. Wines from this trial are being evaluated by a descriptive sensory panel at OSU and by a wine industry panel.

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PRODUCTION, MATURITY, AND WINE COMPOSITION OF WINEGRAPE VARIETIES IN WESTERN OREGON

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Yield, maturity, and wine composition were monitored for 22 winegrape cultivars in three locations, Willamette Valley terrace and floor sites and Rogue Valley floor site, for one to seven years (1976-1982). Yield and cluster size of Gewurztraminer, Muscat Ottonel, Chardonnay, Pinot noir, Gamay Beaujolais, Merlot, and Malbec depended on fruit set in the cooler Willamette Valley sites. High crop loads were deleterious to maturity of Muller-Thurgau, Sylvaner, White Riesling, and Pinot noir in areas under 2500 degree days ($^{\circ}\text{F}$) and also to maturity of Chenin blanc, French Colombard, and Zinfandel at 2500-2900 degree day locations. Harvest data were collected from late September through October. The average fruit composition for most varieties ranged from 19 to 22 $^{\circ}$ Brix, 7 to 12 g/L titratable acidity, and 3.0 to 3.4 pH. Varietal performance varied by season and vineyard location. Maturation was earlier at warmer sites but many cultivars developed varietal character at relatively low levels of soluble solids. Pinot noir developed more color and tannin in areas of 2070-2500 degree days if crop level was below 5.5 T/A. Muller-Thurgau and Gewurztraminer were prone to low acids. Premium quality table wines noted from trial locations in western Oregon included Pinot noir, Gamay Beaujolais, Pinot Meunier, Chardonnay, Sauvignon blanc, White Riesling, Gewurztraminer, Muller-Thurgau, Semillon, Cabernet Sauvignon, and Merlot. A summary of varietal performance, recommended production levels, and regions by degree days, and a qualitative assessment of varietal character obtained in western Oregon is presented.

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TRAINING AND EVALUATION OF A SENSORY PANEL FOR EVALUATION OF PINOT NOIR WINE FERMENTED BY SIX MALO-LACTIC STRAINS

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Twenty subjects volunteered to participate in a selection and training process with the final goal being to develop a descriptive analysis panel for evaluation of experimental Pinot Noir wine. The panelists were tested (23 sessions) for taste acuity, with one member having to be excused for unsatisfactory performance. Seven other members were excused because of schedule conflicts. The final panel met for twelve sessions to learn and practice using proper wine descriptive terminology. Standards of each descriptor plus commercial wine samples were evaluated and discussed at each session. Six final training sessions were held with the six malo-lactic samples. A test design was selected which included five replications of each sample in order to be able to assess panelist reproducibility. Correlation of individual results with the panel as a whole was conducted to evaluate between panelist variability. Using this information, individual panelist data that correlated poorly with the group was screened from the data on an individual attribute basis. After the screening, of the eight major attribute categories evaluated (fruity, spicy, vegetative, earthy, caramel, chemical, microbiological and overall intensity), only earthy, spicy, and microbiological did not show any significant differences among treatments. *Presented at the annual meeting of the American Society for Enology and Viticulture, June 1986.*