

Oregon Wine Advisory Board Research Progress Report

1990 - 1991

Evaluation of Winegrapes, Cultural Practices, and Processing to Improve Wine Quality

Project Leader: Barney Watson, Instructor/Enology Extension, Food Science and Technology

Collaborators:

Steve Price, Horticulture
Porter Lombard, Horticulture
Mina McDaniel, Food Science and Technology
Alan Bakalinsky, Food Science and Technology
Mark Daeschel, Food Science and Technology
Brian Yorgey, Food Science and Technology

Oregon Experiment Station Project: #425

Objectives:

1. To evaluate compositional changes and flavor development during ripening in order to develop better harvest indices, and to develop practical methods to evaluate optimal winegrape maturity.
2. To evaluate the effects of viticultural practices on winegrape maturation, juice and wine composition, and wine quality.
3. To evaluate new microorganisms for optimizing wine quality and stability.
4. To evaluate processing techniques for optimizing wine quality.
5. To evaluate new winegrape varieties and clones for potential commercial wine production in Oregon.

Background and Justification:

Winegrape composition, maturity, and wine quality are effected by commercial viticultural practices such a manipulation of yield, canopy, and cluster environment. Evaluation of the effects of cultural practices on wine composition and quality will result in improved cultural practices for the production of higher quality and more valuable winegrapes.

Monitoring the development of aroma and flavor and the compositional changes that occur during ripening will result in the development of better harvest indices and practical tools for assessing optimal

maturity. In addition, evaluation of the effects of processing and fermentation practices on wine composition, aroma and flavor will help winemakers to adapt specific processing techniques to optimize wine quality.

New strains of malolactic bacteria (with Daeschel) and wine yeasts (with Bakalinsky) will be evaluated in pilot plant trials and commercial wineries. Selection and development of new wine microorganisms for commercial use will allow for better microbial control, will reduce wine spoilage problems, and improve wine stability and wine quality.

Selected varieties and clones are being introduced and evaluated for potential commercial wine production in Oregon. In addition to increasing the genetic diversity of key varieties such as Pinot noir and Chardonnay, new varieties are being introduced which may have potential for Oregon's warmer grape growing areas. The introduction of new clones and new varieties will allow for better long term diversification of our winegrape industry and the production of premium quality wines uniquely suited to Oregon's winegrowing regions.

Progress Report 1989-90:

1. Maturity and Flavor Development of Pinot Noir

The Pinot Noir maturity study was initiated in 1987 at the Woodhall III vineyard in Alpine to closely monitor physical and chemical changes and the development of aroma and flavor of Pinot Noir during ripening. In 1987, 1988, and 1989 cluster samples were taken from the experimental block at 3-5 day intervals throughout the harvest season. The cluster samples were weighed, the berries counted, and the fruit analyzed for Brix, titratable acidity, pH, malic acid, tartaric acid, potassium, anthocyanin, and total phenolic content. Evaluation of this data is in progress and will give us a detailed picture of Pinot Noir development and ripening in three very different harvest seasons.

Replicated wine lots were produced in 1987 from five harvest dates including chaptalized processing trials. The 1987 wines have been evaluated twice at nine months and at fifteen months by an industry panel. Descriptive analysis by the OSU trained panel is also completed. Wines produced in 1988 included six harvest dates and processing trials including partial whole berry fermentation, acid addition, extended maceration, and chaptalization. The 1988 maturity wines have undergone both industry and OSU panel evaluation. The 1988 processing trial wines are currently undergoing evaluation by the OSU panel. In 1989 wines were produced from six harvest dates and are currently being processed. Field samples were taken much earlier in 1989 than in previous years starting prior to the onset of veraison and continuing through mid October. Fluctuations in berry size were observed during the harvest season which appear to correlate with periods of drought and periods of rainfall. Color and maximum anthocyanin content did not necessarily correspond to conventional standards of optimal maturity.

Preliminary analysis of the changes in fruit composition during maturation and wine analysis for 1987 and 1988 was presented January 1989 at the Oregon Horticultural Society (OHS) Winegrape Day. A review of 'Pinot Noir Maturation During the 1989 Harvest Season' and sensory analysis was presented January 30, 1990 at the OHS Winegrape Day.

Gas chromatographic evaluation of maturity wines from 1987 and 1988 is being completed and distinct aroma 'profiles' are apparent in early, mid, and late harvested Pinot Noir and distinct vintage differences are also apparent.

2. Canopy Management Trials

Maturity data was collected at harvest for the upward/downward trellis trial experiment at Bethel Heights Vineyard (BHV) and at the Lewis Brown Farm (LBF) at OSU for the second year. Data was collected at BHV for the vertical (up) trellis and from both exposed and unexposed fruit from the hanging wire (down) trellis. Wines were produced in replicate from the Up and from the Down trellis from BHV.

Wines produced from 1988 and 1989 will be evaluated by an industry panel and the OSU panel.

Maturity data was also collected for the trellis demonstration plot at LBF. Fruit composition at harvest was monitored by field replicates for Pinot Noir, Chardonnay, Rielsing, and Gewurztraminer for five trellis systems. No wines were produced in 1989 because the canopies of the various trellis systems were not fully developed yet.

3. Yield and Shoot Density Effects on Pinot Noir Quality

A trial involving Pinot Noir yields on two different trellis systems was established at Woodhall vineyard in 1989. The treatments include 10, 15, and 20 shoots per meter on a vertical trellis both thinned and unthinned, and 20 shoots per meter on a Scott Henry trellis both thinned and unthinned. The objective is to determine the optimal crop level and shoot density for the two trellis systems for maximum wine quality.

In 1989 maturity data was collected by field replicates for degrees Brix, titratable acidity, and pH. Wines were not produced in 1989 because this was the first year of establishment of the canopy trials.

4. Evaluation of new microorganisms for optimizing wine stability and quality

Parent strains and derived strains of *Saccharomyces cerevisiae* (UCD 505, 595, and 577) were tested in replicated Chardonnay fermentations for their general fermentation characteristics. These derived strains were developed by Bakalinsky and will be used to develop a protease excreting wine yeast to prevent protein haze in white wine. The wines produced by the derived strains will be compared to the parent strains this spring for any differences in aroma and flavor.