Oregon Wine Advisory Board
Research Progress Report
1992 - 1993

Lewis Brown Trellis Trial
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INTRODUCTION AND OBJECTIVES

Trellis design and canopy management have been major research topics in viticulture during the last ten years. The article by Dave Adelsheim in the first edition of the "Oregon Winegrowers Guide" and the presentations of Shaulis, Smart, Carboneau, Intrerari and Koblet at the 1984 Cool Climate Symposium in Eugene were particularly influential in bringing this subject to the attention of winegrape growers in Oregon. These presentations came just before a major expansion in Oregon winegrape plantings. Many of the vineyards established in Oregon during the early 1980s were planted with the expectation that improvements in trellis design had the potential of both increasing both wine grape quality and production. Canopy management research work at Oregon State University began in 1984 to test the potential of these production systems in Oregon.

One of the larger experiments was the Lewis Brown Farm trellis trial planted in 1984. The trial included the standard system used in Oregon (an upright vertical system with both cane and cordon training) with some of the trellis designs that were advocated at the 1984 Eugene symposium (the Open Lyre, The Geneva Double Curtain) as well as one developed in Oregon (the Scott Henry Trellis). The primary objective of the trial was to determine the effect of trellis design and vine structure on fruit and wine quality. Four cultivars were included in the trial: Pinot noir, Chardonnay, Reisling, and Gewurztraminer. The experiment's design was structured to minimize yield responses; the question of canopy management on crop load has been addressed in other experiments. This decision has generally allowed the evaluation of fruit and wine quality responses without the complications of yield-quality interactions.

The field trial has now been completed although data from 1992 is still being processed and wines from both 1991 and 1992 have yet to be evaluated. The following discussion briefly reviews the main research results from the trial. A final report will be presented to the industry after wines from the 1992 season are evaluated.

RESULTS AND DISCUSSION

We have been monitoring the vine and fruit responses in the trial since 1986. Although there have been significant vintage differences over the course of the experiment, many of the vine and fruit responses have been fairly consistent. The most consistent and visible response has been canopy density. The divided canopies always had more open canopies than the upright cane and cordon-trained systems. They had fewer shoots per meter of canopy, shorter shoots, fewer leaf layers, better exposed clusters, and less incidence of botrytis and mildew than the upright systems.
These differences had consistent results on grape and wine phenolic composition. Pinot noir wines made from the divided canopies always had higher anthocyanins and total phenolics. This resulted in wines with a more complex tannin structure and generally higher intensity. Although none of the wines from this trial were evaluated by sensory panels or gas chromatography there were also aroma differences between the divided and single canopies.

In industry tastings, the differences in the color and phenolics were always noticed, but there was never an overwhelming preference for the aroma or the overall wine quality of any specific treatment.

Some of the responses varied by variety. Titratable acidity (TA) in Chardonnay was highest on the single canopies while TA in Gewurztraminer was lowest on the single canopies. There was no significant difference in TA in Pinot noir. Some of this difference was due to differences in the maturity at harvest. Chardonnay TA could be correlated with malate levels but malate levels on Pinot and Gewurztraminer were much lower and did not seem to be related to TA. Potassium levels in must had a significant effect on pH in Pinot noir but had no effect on pH in Chardonnay. It seemed that fruit and wine responses directly related to cluster exposure, such as phenolics, were more consistently affected by changes in canopy than less direct responses such as TA or pH that depend on several different variables. Growth responses were generally not affected by variety. All four varieties had the most growth and most dense canopies on the cordon treatment and the least growth and least dense canopies on the GDC.

In 1992, growth and fruit composition were monitored on all four varieties and replicated wines lots were made from Pinot noir. Preliminary results from 1992 are consistent with other year's data.

1992 was intended to be the last year of the experiment, but we have decided to retain the trial at least for one more year as an extension and teaching tool. Over the past nine years, hundreds of growers and students have visited the trial to learn about trellis construction, vine maintenance, and vine growth and development.