

# Oregon Wine Advisory Board Research Progress Report

1992 - 1993

---

## Enology Personnel Development and Extension

Barney Watson  
Department Food Science and Technology  
Oregon State University

### INTRODUCTION AND OBJECTIVES

The Oregon wine industry has grown rapidly in recent years to 100 wineries. There is a strong and increasing need for enology Extension, technical assistance, and technology transfer of relevant research for commercial application. Enology Extension at OSU provides technical assistance to wineries with an emphasis on troubleshooting production problems and training of industry personnel.

The primary focus of the OSU enology Extension program is to increase commercial wine producer ability to recognize, avoid, and correct for physical, chemical, and microbial problems in Oregon wines. This is done primarily by consultation, troubleshooting analysis of problem wines, and by training industry members in laboratory analysis and wine stabilization at the OSU Enology Laboratory.

In addition, technical workshops and seminars are organized to provide educational materials and to demonstrate processing and quality control management practices to industry members to enhance their ability to produce sound, high quality table wines.

Seminars and workshops focus on wine processing and microbiology, wine analysis and stabilization, and sensory evaluation training for detection of wine defects.

### RESULTS AND DISCUSSION

This last year over 200 wines were submitted to our laboratory by over 40 wineries for evaluation and analysis. Analysis included must and wine composition, chemical and physical stability testing, fining trials, and extensive microbial evaluation and troubleshooting of individual winery problems.

During the 1992 harvest season many wines were sampled from several commercial wineries during fermentation in order to isolate numerous lactic acid bacteria from Oregon wines. After isolation the bacteria are being identified and used for ongoing research trials (see Daeschel, Use of nisin resistant strains). In addition to building a "library" of Oregon lactic acid bacteria, we were able to obtain microbiological profiles of several different wineries and to relate the established microflora in different wineries to their processing practices.

For example, of 71 wines screened 22 (31 percent) had detectable levels of *Lactobacillus* Sp. (rods) present during and after the primary yeast fermentation (Table 1). Of the five wineries screened the percent of wines with detectable lactobacilli ranged from 0 to 80 percent. The winery with 80 percent

has been having chronic 'lactic' spoilage problems in some wines for several years. These bacteria are serious potential spoilage organisms in wines, particularly in the presence of fermentable sugars. They readily metabolize sugars to acetic acid and lactic acid, resulting in rapid wine spoilage due to excessive volatile acidity.

Table 1. 1992 Microbial Screening of New Wines from Oregon

Winery	Number Wines Screened	Number with <i>Lactobacillus sp.</i>	%
A	18	7	39
B	10	8	80
C	26	2	8
D	11	5	45
E	6	0	0

In recent years we have encountered an increasing number of commercial Oregon wines with microbial defects due to lactic acid bacteria and spoilage yeasts such as *Brettanomyces sp.* The trend toward minimal processing and the use of little or no SO<sub>2</sub> before fermentation is at least partly responsible for many of the problems we have observed. An article entitled "Occurrence and prevention of lactic spoilage during fermentation" will be in our first Enology and Viticulture Extension Newsletter published February 1993.

We are continuing to gear up our OSU Enology Laboratory to provide specialized quality control services to the industry and for teaching and training purposes. In addition to evaluating wine chemical and physical stability problems and chemical analysis of musts and wine composition, we now have the capability to evaluate wines for microbiological stability.

The following quality control services are currently available from the OSU Enology Laboratory:

**Microscopic screening:** Wineries are encouraged to submit samples for microscopic screening for determining viability of wine yeast and malolactic bacteria and for the detection of potential spoilage microorganisms. Microscopic screening is strongly recommended for juice and musts during processing, wines during fermentation, processing, and aging.

**Microbial stability of bottled wine:** Wine samples should be evaluated after bottling for the presence of wine yeast and bacteria and potential spoilage microorganisms. We encourage wineries who are not currently evaluating bottled wines to submit wines for plating. Unfiltered wines and wines not sterile filtered are always potentially at risk for post-bottle spoilage. Sterile filtered wines need to be plated for viable yeast and bacteria to ensure the integrity of the sterile filtration to avoid post bottling re-fermentation. We provide training to winemakers in sterile plating techniques and assistance in setting-up the assays in their wineries. Advice and consultation is also available on filtration and sterile bottling procedures.

Differential Plating for Yeast and Bacteria: Wine samples can be plated on differential media to identify and enumerate the microorganisms present, including *Leuconostoc oenos*, *Pediococcus* sp., *Lactobacillus* sp., acetic acid bacteria, and spoilage yeasts including *Brettanomyces* sp..

## **FUNDING HISTORY**

Oregon Wine Advisory Board support for enology research and Extension was initiated in 1984. WAB support in 1992-1993 for the project entitled Personnel Support for Enology Research and Extension is \$28,423, including 35 percent enology research and 15 percent enology Extension FTE support for Watson's position (matched by OSU Agricultural Experiment Station). and funds for supplies, telephone, and travel.

## **WORKSHOPS, SEMINARS, AND INDUSTRY PRESENTATIONS**

Price, Steve and Barney Watson. 1992. Grape cultivar response to trellis systems. June 9, 1992. 3rd International Cool Climate Symposium, University of Mainz, Germany.

Watson, Barney and Steve Price. 1993. Enology and Viticulture Extension Notes. Volume 1, No. 1, February 1993. Occurrence and prevention of lactic spoilage during fermentation. (Watson). Leafroll at FPMS (Price).

Watson, Barney. 1992. Evaluation of Winegrape Maturity in Oregon. Chapter 28. Oregon Winegrape Grower's Guide. 4th Edition.

Watson, Barney. 1992. Current Topics in Wine Production Management, May 13, 1992. LaSells Stewart Center, OSU. A workshop focused on use of sulfur dioxide, wine microbiology, fermentation management, and the use of pure cultures of yeast and bacteria was attended by 65 industry members.

Watson, Barney. 1992. Recognition of Commercial Wine Defects, three seminars April 13, July 22, December 16, 1992. Presented to the Wine Advisory.

Watson, Barney. 1992. Board Wine Screening Panel at the Oregon State Department of Agriculture to train industry members to recognize commercial wine defects.

Watson, Barney and Steve Price. 1992. Anthocyanin content of Oregon Pinot noir fruit and wine: effects of vintage, fruit maturity and processing. Presented June 10,- 1992. 3rd International Cool Climate Symposium, University of Mainz, Germany.

Wine Microbiology Workshop, August 15,1992. A workshop was co-organized in conjunction with the Northwest American Society of Enology and Viticulture annual meeting in Kelowna, British Columbia. Microbiological laboratory procedures and culturing techniques for wine yeast and bacteria were presented to 25 industry members from Oregon, Washington, and Canada.