Title
Productivity, Cost and Profitability of Wine Grape Production in the U.S. Pacific Northwest: Econometric Analysis of Farm-Level Agricultural Census Data

I want to submit an abstract for:
Conference Presentation

Corresponding Author
John Antle
E-Mail
john.antle@oregonstate.edu

Affiliation
Dept of Applied Economics, Oregon State University

Co-Author/s

<table>
<thead>
<tr>
<th>Name</th>
<th>E-Mail</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susan Capalbo</td>
<td><a href="mailto:susan.capalbo@oregonstate.edu">susan.capalbo@oregonstate.edu</a></td>
<td>Dept of Applied Economics, Oregon State University</td>
</tr>
<tr>
<td>Hongliang Zhang</td>
<td><a href="mailto:hongliangzhang08@gmail.com">hongliangzhang08@gmail.com</a></td>
<td>Dept of Applied Economics, Oregon State University</td>
</tr>
</tbody>
</table>

Keywords
Productivity, cost, profitability, wine grapes, Oregon, Washington, census data

Research Question
Evaluate the factors affecting productivity, cost and profitability of wine grape production in the Pacific Northwest region of the United States

Methods
Econometric panel data methods applied to farm-level census data for 2002, 2007 and 2012

Results
Provide the first econometric estimates of factors affecting the economic efficiency of wine grape production in the Pacific Northwest region. Evaluate the use and limitations of census data.

Abstract
The wine grape industry in the Pacific Northwest of the United States is a small but growing component of wine production in the United States, representing about 10 percent of U.S. acreage in 2014, compared to California’s 60 percent of acreage. It is highly heterogeneous in both agronomic and economic aspects. Combined economic impact of vineyards and wineries to the states of Oregon and Washington exceeded $8 Billion in 2013, which reflects an average growth of around 8% for the 2009-2013 period. Number of wineries and vineyard acreage showed similar growth rates, with more than 50,000 acres planted to wine grapes in WA in 2013, and 26,000 in Oregon. In contrast, there are about 350 wine grape producers in Washington and over 900 in Oregon, illustrating the differences in number and scale of average operations, as well as the high degree of
heterogeneity both across and within sub-regions. The PNW is attracting outside investment in response to favorable projections of wine demand and climatic conditions.

At present, most of the data available on this industry are highly aggregated, such as USDA published data, or are "representative" budgets from extension economists. This information masks the high degree of heterogeneity within and between sub-regions. Aggregate data from USDA show, for example, large differences in yields across the region and between this region and California, the largest wine grape producing area of the United States. For example, 2014 yields in California were reported to be 7.5 t/ac, 7.1 t/ac in Washington but only 3.1 t/ac in Oregon. These differences are likely due to grape variety, quality and environmental conditions, as well as differences in scale of operation and type of management. In the agronomic dimension, production areas vary from coastal valleys to inland areas with widely varying soils and climate, and a large number of red and white grape varieties. Production ranges in scale from a few hectares to thousands of hectares, and management ranges from part-time “lifestyle” to skilled professional. Little is known about the economic efficiency of these widely ranging operations, although casual observation and discussions with producers suggests there are large efficiency differences, as well as large differences in the quality of grape being produced and type of market being targeted by producers. Industry expresses interest in having more systematic information about economic performance and scale of the operations and how it could be improved by scaling up and integrating with supply chain operations, while addressing consumer demands for high quality wine produced sustainably. Both Oregon State University and Washington State University have research facilities to study viticulture and enology, but little formal collaboration to date on economic data collection, research and analysis.

The goal of this paper is to begin to fill this gap in economic understanding of this industry in the Pacific Northwest. We will present preliminary econometric analysis of farm-level agricultural census data on crop yields, costs and net returns. This analysis will be based on the confidential farm-level data from the 2002, 2007 and 2012 agricultural censuses that provide detailed data on crop areas, yields, value of production and cost of production. Due to the data confidentiality, analysis must be carried out by special agreement with the National Agricultural Statistical Service in their office in Olympia, Washington. Also due to confidentiality, individual responses can be identified spatially by zip code area, and to some degree by other spatial criteria such as AVA but not by precise location. One goal of this preliminary analysis will be to evaluate the usefulness of the data in this form, and explore the potential value of linking these data with site-specific soils, climate and other data.

Our paper will also evaluate other aspects of the usefulness and limitations of the census data. The power of the census data is that it represents almost all producers, and provides a large sample size. There were more than 1,000 wine grape producers in Oregon and Washington during the period covered by available data. However, due to the rapid growth of the industry, there are a number of challenges associated with the use of the census data that need to be addressed. Obviously, new areas are being brought into production, while land holdings change ownership and are consolidated or re-distributed. Also, census data identifies the location of the owner who may not be located on the production site. The census provides detailed data on area, yield and whole farm cost, but has some limitations in distinguishing capital costs and operating costs, as well as taxes. Another important limitation is that it provides information on input costs, but not quantities.

This preliminary analysis will apply established panel data econometric methods to assess agronomic and economic factors affecting productivity, cost and profitability. We will estimate yield functions, cost functions, revenue functions and profit functions, and evaluate these econometric models critically in relation to the data issues discussed above. To the extent possible, we will estimate models with the data pooled across the region and over time, and also stratify by region to test hypotheses about differences in technical and economic efficiency across sub-regions, grape varieties, scale and type of ownership. We will also evaluate the degree to which these data can be combined with information on sales and land prices to assess other economic issues such as the value of AVA designations and productivity.