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# Implications of a Changing Agro-Ecosystem on the Nascent Wine Grape Production Industry in Idaho

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## **Implications of a changing agro-ecosystem on the nascent wine grape production industry in Idaho**

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Wine-grape growing in the state of Idaho is just now coming into its own. Unlike traditional and established row crops, sustainable wine grape production requires the encouragement and development of new agricultural capacity in the state. Concurrently, creating a sustainable wine grape production culture in the state may be constrained and impacted by a changing climate and related stresses on the ecosystem of the semi-arid inland northwest. An understanding of the effect that a changing ecosystem will have on the viability of growing wine grapes, as well as an examination of the challenges that both farmers and policymakers will face in developing and maintaining wine grape production is critical to the successful establishment of a vibrant viticulture in Idaho.

The nascent viticulture of Idaho is a prime example of the convergence of the human and ecological systems in a changing environment faced with economic, environmental, and policy challenges. Addressing these challenges through an interdisciplinary lens allows us to consider and contribute to the broader topic of sustainable agriculture in the face of shifting climate and policy regimes. More specifically, considering the developing wine-grape production industry in Idaho as issues are addressed in the early stages of its development rather than focusing on an established crop allows us a unique perspective on the agro-ecosystem sustainability theme.

We have identified four areas that we expect to most affect the viability of establishing a vibrant viticulture in Idaho: [1] The culture of regional wine, including the benefits of tourism and the implications of becoming an established American Viticultural Area (AVA); [2] The economic impact and opportunities facing farmers shifting to a potentially more lucrative, yet vulnerable, commodity; [3] Policy that either constrains or promotes the wine production industry; and [4] The significant challenges that agricultural systems face in lieu of a changing climate. An analysis of these themes amid a consideration of their interconnectedness will allow us to present a broader perspective on this agro-ecological system and discuss the implications for sustainability.

### **Culture**

An examination of the viability of wine grapes as a commodity in Idaho must take into account the

culture that permeates the wine industry as a whole. Fuller (1993) importantly recognizes that “wine enthusiasts employ their own language, advocate their own behavioral codes and engage in ceremony[y]” (p. 39), highlighting the distinction that wine culture holds to its participants. A 2006 study in wine tourism found that 79% of respondents had recently traveled to wine-producing areas and 70% were at least “very interested” in visiting a wine-producing region in the future (Getz & Brown, 2006). The amount of tourism that vineyards produce should not be underestimated and will be influential in the success of a developed viticulture’s success.

Getz & Brown (2006) distinguish three categories of wine culture which need to be considered as challenges to a nascent wine-region. The first, *core wine product*, is representative of the quality of the wines and the number of the wineries available in the area, suggesting that a region dense in wineries and vineyards would be of greater appeal to tourists. Second is the *core destination appeal* which includes regional weather, prices, and activities external to the vineyards. Any challenges these present may be difficult to control, yet being cognizant of the effects of policy on factors that influence these variables is necessary for a holistic analysis. Lastly, and the most intangible, is *the cultural product*. The cultural product is reflective of the appeal due to regional character that develops over time. In order to bolster regional appeal, a wine region can petition to be classified as an American Viticultural Area (AVA) through the Alcohol and Tobacco Tax and Trade Bureau, a designation that connects a geographically bounded location with distinctive features and characteristics of viticulture and terroir of the region.

## Economics

The economics of viticulture are diverse and can be further parsed into the economic *potential* of a robust viticulture and the economic *liability* of shifting to a lucrative and potentially vulnerable commodity. The state of Idaho is reliant on the agricultural revenue that is founded on established crops, thus any serious discussion of developing a wine-grape producing region must take into account the impact of farms converting from their existing crop in order to allow wine-grape production, as well as the opportunities for new farmers to start wine grape production. Given the revenue that wine can – and does – generate, it is not difficult to understand why the state of Idaho is interested in these conversions.

The Idaho Wine Commission reported that the current wine industry in the state had an economic impact of \$169.3 million in 2013, which pales in comparison to California’s reported retail-valued wine exports of \$23.1 billion. The economic incentive to develop a vibrant viticulture is large, especially given that a 2002 study of the terroir of southwestern Idaho found that it “has the potential to become a nationally recognized grape-growing region” (Woodall et al., 2002) citing the similarities in growing conditions with those in well-developed wine-grape growing regions.

The economic liability of shifting agricultural focus to wine-grapes stems from two factors: [1] There is a 5-10 year time lag between planting vines and realizing profits, and [2] Idaho experiences winter temperatures roughly every 8 years that are cold enough to kill grape vines. These challenges pose a considerable risk in shifting crops to wine-grapes, yet can be mitigated by carefully crafted policy – such as subsidies for the formative years to farms that plant wine-grapes – as well as an understanding of the affects that climate change will have on winter temperatures. Furthermore, there is a body of literature regarding winterkill in wine-grapes, detailing strategies to adapt grapevines to cold weather and recovery methods in the case that winterkill occurs (Folwell et al., 2001, Goffinet, 2004, Kaiser et al., 2008).

## Policy

The incentive to establish a viticulture industry in Idaho is large, given the economic potential and the terroir of the region. Although there are many policy challenges that are founded on water rights (given that wine-grapes require 25-35” of water a year), commerce laws, and other agricultural rules and regulations, the policy challenges unique to a developing viticulture industry are primarily conversion incentives.

As discussed, wine-grape vines require 5-10 years to reach profitable production status which highlights a significant disincentive for farmers to invest in the infrastructure to shift to wine-grapes. The USDA Specialty Crop Block Grant Program has been used for “marketing, research, wine trails, establishing wine and cuisine partnerships, development of online educational manuals for new and existing wineries and growers...[and] procurement of more efficient wine processing equipment” (Nelson, 2008). State programs that reflect federal programs such as these, aimed at supporting specialty crop growers – like wine-grape growers – would greatly benefit the burgeoning industry.

## Climate Change

Lastly, projected climate change – including changes in water availability, temperature fluctuations, and soil degradation – pose significant challenges to an industry that is highly sensitive to climate (Hannah et al., 2013). The terroir of a vineyard is critical to the quality of the grapes – and thus the quality of the wine – as well as distinguishing the region from other wine-grape producing regions in order to solicit an AVA designation which can help to significantly bolster a region’s cultural capital.

A 2013 study on the suitability of regions to grow wine-grapes given climate change estimates found that many regions that have been historically well-suited for viticulture are projected to decline in suitability, whereas northern regions in North America and Europe are projected to increase in the suitability to produce wine-grapes (Hannah et al., 2013). These projections are due to expected temperature rises that favor wine-grapes (also, as an aside, warmer winters will reduce the risk of winterkill) and water availability. A 2007 study analyzing the performance of 23 varieties of wine-grapes in southwestern Idaho found many varieties well-suited to the climate and the soil which, taken with the results that climate change may provide more favorable growing conditions in the area, gives support to the nascent viticulture industry (Shellie, 2007).

## Conclusion

The wine-grape growing industry in Idaho is set to flourish in the agriculture-intensive state, providing new economic benefits from this specialized crop. Consideration of multiple factors in the agro-ecosystem, including cultural, economic, and policy, in conjunction with a changing climate provides a more comprehensive perspective on the potential opportunities and barriers facing the industry.

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