

## Padua 2017 Abstract Submission

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### Keywords

Survey, marketing, mid-Atlantic, Internet, cover crop, price, bunch rot

### Research Question

What factors (retail base price, bunch rot control measures, and weed control strategies) and assortment of factor levels (e.g. retail base price of \$12.00) affect consumer purchasing decisions?

### Methods

Conjoint analysis was used to present the individual factors in combinations. The outcome identifies the factors that were important to survey participants, and what levels within each factor appealed.

### Results

Price accounted for at least 55-57% of the participants' likelihood of buying the wine. Averaged importance for the cover crop and bunch rot control factors were much lower.

### Abstract

The purpose of this research was to conduct a survey with a large sample of wine consumers in the mid-Atlantic region of the United States to better understand what factors influence the wine they purchase. Data were collected through a 15-minute Internet survey, conducted 28 and 30 March 2016, administered to Survey Sampling International, LLC (Shelton, CT, US) panelists residing in three U.S. states (New Jersey, New York, and Pennsylvania) with responses collected using SurveyMonkey.com (Palo Alto, CA, US). Panelists were also screened for not being a member of the wine industry, being at least 21 years old, and for having purchased and drunk wine at least once within the previous year. Surveys were pre-tested by 73 panelists who were a subset of the target consumer. For the survey, 753 participants opened and attempted the survey with 658 qualifying and completing the questionnaire.

Internet Survey Participant Geographic, Demographic, and Behavioral Characteristics

Slightly less than half (46.4%) of the participants lived in New York, with 29.8% living in Pennsylvania, and 23.8% living in New Jersey (Table 1). Most common responses to demographic questions were: female (58.1%); married (65.9%); resided in a household with no children (62.7%); lived with another adult (84.4%); lived with at least one other adult wine drinker (66.1%); were a member of Generation X (between age 36 and 51 years, 30.4%) or the Older Millennial generation (between age 26 and 35 years, 20.4%); possessed a bachelor's degree (35.7%) or a post graduate degree (21.4%); and had an annual household income between \$100,000 and \$149,999 (20.3%), \$76,000 and \$99,999 (19.6%), or \$50,000 and \$75,999 (19.4%).

Based on responses to wine purchasing frequency, 27.2% of respondents purchased wine "two to three times a month," 25.1% "about once a month," and 20.2% "a few times a year." Regarding wine consumption during this period, nearly half of participants (48.6%) indicated that they were "super core" wine drinkers (drank wine "daily" to "a few times a week"), with 32.4% being "marginal" wine drinkers (drank wine "two to three times a month" or less), and 19.0% were "core" wine consumers (drank wine "about once a week").

### Conjoint Analysis

One of the study's objectives was to determine what factors (retail base price, bunch rot control measures, and weed control strategies) and assortment of factor levels (e.g. retail base price of \$12.00, removing grape leaves to reduce the number of fungicide applications) appealed to participants and that could affect their decision to purchase wine sold in a 750 ml glass bottle. Conjoint analysis was used to present the individual factors in combinations, which is how consumers actually view and evaluate products. The outcome results in identifying the factors that were important to survey participants, and what levels within each factor appealed.

Factors selected for the conjoint analysis were: 1 = bunch rot control, 2 = weed control, and 3 = retail base price for a 750 ml glass bottle of wine produced in the mid-Atlantic region. The levels for these factors were: two levels of bunch rot control (a = grape leaves are removed from around the fruit and two fewer fungicide application are needed to control bunch rot, with this process adding \$1.00 to the bottle of wine and b = grape leaves are not removed from around the fruit and two additional fungicide applications are required to control bunch rot, with no addition to the retail base price); two options for controlling weeds (a = cover crop is planted below the grapevines and the use of herbicides is eliminated, with this process adding \$1.00 to the bottle of wine and b = no cover crop is planted below the grapevines and herbicide applications are needed to control weeds, with no addition to the retail base price); and four retail base prices (a = \$12.00, b = \$16.00, c = \$22.00, and d = \$26.00).

Price levels were selected based on cost of production calculations and retail base prices for wine produced in the mid-Atlantic region that is sold in 750 ml glass bottles, and combinations were created using SPSS statistical software version 23.0 (Chicago, IL). An orthogonal array was created using OrthoPlan resulting in eight non-repeating combinations of bunch rot control, weed control, and retail, and two holdout cases.

Participants were asked to read two short statements. The first was about bunch rot, how the disease reduces the number of healthy grapes on a vine, and that removing grape leaves from around the fruit can reduce the likelihood that the disease will occur and that two fewer fungicide applications will be needed. The second was about the use of herbicides under the grapevine trellis to control weeds, that soil left bare from herbicide use can encourage erosion and runoff, whereas planting a cover crop under the grapevines may control weeds while reducing or eliminating herbicide use and soil erosion. In both statements, participants were informed that the process of removing leaves and planting cover crops would each add a \$1.00 to the retail base price of the wine, which could raise the price of each bottle by \$2.00 if both processes were implemented. Thus, not only would they need to consider the base price of the bottle, but participants would need to be considered that a \$26.00 bottle of wine, for example, would actually be increased to \$28.00 if both the cover crop was planted and leaves were removed around the fruit.

After informed of what each combination entailed (retail base price, cover crop treatment, and bunch rot treatment), participants were asked to rate each combination using a seven-point Likert scale (1= very unlikely; 7= very likely) as to their likelihood of purchasing the bottle of wine based on the three factors, regardless of varietal, to serve to family and/or friends in their home.

The averaged importance for each factor was calculated by dividing the range of utility (value) for a factor (a measure of how liked or disliked an attribute was by the survey participant) by the sum of these ranges across all factors, then multiplying by 100. The averaged importance for the three factors were: retail price (57.40%), cover crop (21.49%), and bunch rot control (20.76%). Hence, retail price was considered more important than either cover crop or bunch rot control to participants.

Differences were apparent when levels within each factor were examined. Within the retail price factor, the retail

base price for a 750 ml glass bottle of \$12.00 and \$16.00 received positive utility values, 0.742 and 0.367, respectively, indicating that consumers preferred these prices compared to the \$22.00 and \$26.00 retail base prices, which received negative utilities. The more positive the value, the more it is preferred by consumers, while more negative values are less preferred.

Within the cover crop factor, the presence of a cover crop with an additional \$1.00 charged per 750 ml bottle, to cover labor and material costs, received a positive utility rating (0.363), while the absence of a cover crop under the grapevine (-0.363) was not as favored by participants. Removing the leaves around the fruit to control bunch rot and adding \$1.00 to the 750 ml bottle, to cover labor costs, received a positive utility rating (0.315), while not removing leaves to control bunch rot (-0.315) received a negative utility rating, and was not as favored by participants.

Survey responses were also segmented based on interest in: 1) minimal insecticides and/or herbicides used in the vineyard and 2) cover crops used in the vineyard to control weeds, then subjected to conjoint analysis to determine if averaged importance or utility differed based on participant level of interest (not at all interested; slightly and somewhat interested; and very and extremely interested).

In both instances, the averaged importance for price was greater for those who responded that they were "not at all interested" in the vineyard practices (60.3% for "minimal use of insecticides and/or herbicides" and 61.9% for the "use of crop covers") compared to those who were "very"/ "extremely interested" (55.5% and 55.3%, respectively) in the practices being implemented. Within the price factor, regardless of vineyard practice and participant level of interest in the practice, a pattern existed with positive utility ratings assigned to the \$12.00 and \$16.00 base prices and negative utility ratings assigned to the \$22.00 and \$26.00 base prices. For both the cover crop and bunch rot control factors, regardless of level of interest, removing the leaves around the fruit to control bunch rot and planting a cover crop to control weeds, each practice adding \$1.00 to the 750 ml bottle to cover labor costs, received positive utility ratings.

Conjoint analysis can help identify which factors consumers prefer and, within the factors, which levels are desirable. Based on averaged importance, for all conjoint analyses presented here, the price factor for a 750 ml glass bottle of wine produced in the mid-Atlantic region accounted for at least 55-57% of the participants' likelihood of buying the wine, regardless of varietal, to serve in their home to family and friends. Though the averaged importance for the cover crop factor (range of 15.5 to 23.3%) and bunch rot control (range of 19.7 to 22.9%) were much lower than price, in every case the utility ratings for planting a cover crop and for removing leaves around the fruit to control bunch rot were positive, even when participants were informed that each practice would add a dollar to the base price. Thus, it is apparent that there is interest in "sustainable" and "environmentally-friendly" vineyard practices. Vineyard and winery industry members should be aware of consumer interest in purchasing wine made from grapes grown using these practices, but they should also be aware that a consumer's purchasing decision is greatly impacted by price, and that a base price of \$12 and \$16 were more favorable than higher base prices.