

Tbilisi 2022 Abstract Submission

Title

Wine Lovers, Fruit Trees and Bohemian Hops: A Discrete Choice Experiment Approach to Valuing Czech Crop Diversity

I want to submit an abstract for:

Conference Presentation

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Keywords

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Research Question

How much is the Czech public willing to pay to conserve at-risk local varieties of wine, hop and fruit trees?

Methods

We elicit the preferences of 1,268 Czechs regarding their WTP for the conservation of hops, wine and fruit trees using an online survey and the discrete choice experiment method.

Results

We find strong preferences among Czechs for conserving fruit tree varieties, followed by wine and finally hops. WTP is found to be strongly connected to drinking habits.

Abstract

Crop diversity, or plant genetic resources for food and agriculture (PGRFA), includes cultivated crop varieties (both modern and traditional) and the wild relatives of crops. There is an incredible diversity of crop varieties worldwide, with more than 100,000 varieties of rice; and the use by plant breeders of the genetic diversity contained within these resources is one of the primary drivers of increases in agricultural productivity. Beyond their use in breeding, crop varieties also have direct use through consumption as well as cultural value.

This study uses stated preference techniques to elicit the preferences of the Czech public to determine how much they are willing to pay to conserve three specific types of crop diversity: fruit trees, wine varieties and hops. These crops were chosen because the many varieties of each are usually very distinguishable, and are present in recognizable Czech products such as beer, wine, fruit brandies, fruit, jams, etc., that are of general interest to the Czech population. The Czech Republic is well known as being one of the top hops producers worldwide, with high quality Saaz hops and well-known tradition dating back at least a millennium, and the Hop Research Institute in Žatec conserves a number of hop varieties. A collection of fruit tree varieties is maintained by the Research and Breeding Institute of Pomology Ltd., in Holovousy, including apple, pear, plum, sweet cherry and sour cherry varieties.

Less well known is the country's wine tradition. Wine grapes were first brought by the Romans to their fort at Vindobona (in current day South Moravia) after Emperor Marcus Aurelius annulled the previous prohibition on planting wine grapes in colonies north of the Alps, and the Czech Republic has an old wine-growing tradition in its South Moravian region. Several viticulture stations including in Vrbovec and Karlštejn work to maintain a number of local and old wine varieties such as Ryzlink buketový, Semillon, and Veltlínské červenobílé.

Methodologically, we use an online stated preference survey to elicit preferences for the conservation of each type of crop – specifically through the use of a discrete choice experiment administered to a Czech-representative sample (n=805) and a sub-sample from the agricultural region of South Moravia (n=463). The primary objective of the choice experiment is to derive the mean willingness to pay (WTP) of the Czech population (as well as a South Moravian sub-sample) for the conservation of additional varieties of hops, wine and fruit trees, and to determine the degree of heterogeneity among the Czech public in terms of their preferences for the conservation of different specific crop types. We utilize the mixed logit approach as our preferred econometric approach for determining WTP. While the more basic multinomial logit model relies on a number of assumptions that can be difficult to prove, such as the independence of irrelevant alternatives (IIA), the mixed logit model is robust to a number of these assumptions. In addition, another advantage of the mixed logit approach is that it allows the analysis of unobserved preference heterogeneity. We additionally employ latent class analysis.

We find that Czechs are willing to pay about \$11 per respondent for fruit tree conservation, \$6 per respondent for wine conservation, and \$4 per respondent for hop conservation. Respondents from the agricultural region of South Moravia are willing to pay about three times more for fruit tree conservation, and about four times more per respondent for wine and hop variety conservation.

We further find that several variables related to respondent habits are significant in terms of predicting WTP for conservation programs for each crop type. For example, wine lovers (defined as those who prefer to drink wine over other alcohol types) were WTP more than twice as much for wine varietal conservation programs when compared with non-wine lovers, while gardeners were WTP more for hop and fruit tree conservation programs.

In conclusion, we found a strong preference among Czechs for conserving fruit tree varieties over hop and wine varieties, and estimate an aggregate WTP for the Czech Republic for a 10-year conservation program for additional fruit tree varieties of approximately \$82 million. Aggregate country-wide WTP for conserving additional wine varieties was estimated to be about \$43 million, while aggregate WTP for hop conservation was estimated at about \$27 million. These estimates increase by between 30 to 80% (depending on the crop) for programs conserving the maximum number of varieties proposed (35). These sums are substantial when compared to the comparable 10-year cost of about \$15.4 million of running the entire Czech genebank system, with holdings consisting of over 50,000 seed samples. In addition, we found evidence of significant heterogeneity in the sample in terms of preferences for conserving the three crop types, and this finding was corroborated by further analysis with several variables interacted with socioeconomic characteristics. For example, we find that only those who regularly gardened were WTP to conserve hop varieties (and not beer lovers), while “wine lovers” were WTP more than twice as much as the general population for the conservation of wine varieties.

In terms of policy implications, our results suggest that work by the Czech National Programme for Agrobiodiversity to search out, collect and conserve fruit tree, wine and hop varieties that are not currently in the national genebank holdings would have substantial social welfare benefits, particularly when compared to the costs of conservation. We found that the public was most interested in paying to conserve additional fruit tree varieties, indicating that

this crop should be prioritized for further collection and conservation efforts; however, the ratios between the WTP estimates for conserving the three crop types to the current 10-year conservation costs were quite large for all three, ranging from a ratio of 43 in the case of fruit trees to 59 in the case of wine varieties. We thus find strong support among the public in terms of their demand for the crop diversity conservation services provided by the national Czech genebank system, and our results suggest that Czechs would support an expansion of these programs in the case of these crops.

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