



Agricultural Wage and Practices Survey: Preliminary Analysis

December 22, 2015

Brief summary

The Employment Security Department's (ESD) preliminary analysis of responses to the 2015 Agricultural Wage and Practices Survey reveals significant differences from previous years' survey results. The differing responses line up with guidance publicly provided by the Washington Farm Labor Association (WAFLA), and appear to impact the preliminary prevailing wage rate estimates for Fuji, Golden Delicious and Granny Smith apple varieties.

ESD has not yet completed preliminary wage estimates for row and nursery crops, nor preliminary practice results for orchard, row or nursery crops. We will be completing those analyses by the end of January. There were not enough respondents regarding animal production for ESD to be able to estimate prevailing wage rates or practices for those activities.

Background

ESD has historically conducted an agricultural wage and practices survey every two years focused on apple thinning, apple harvest, pear harvest and cherry harvest. The U.S. Department of Labor (DOL) uses the results of the survey to establish wage rates and employment standards required in agricultural employment contracts, including H-2A guest worker contracts. DOL has directed ESD to begin conducting the survey every year and to survey for all occupations and activities for which employers have requested temporary workers through the agricultural recruitment system.

In the fall of 2014, ESD began developing a new, annual survey that would comply with DOL's directive to the state. As part of this process, ESD circulated drafts of the survey with a broad range of stakeholders and held multiple conference calls to discuss questions and concerns with those drafts. Given the changes from past survey practice, ESD tasked Washington State University (WSU) with conducting a pilot with a smaller, but diverse, number of employers to test two versions of the new survey, beginning in the spring of 2015. The results of the pilot informed the final version of the survey that WSU administered on behalf of ESD to all agricultural employers in the state from September 21 through October 30, 2015.

In August, ESD became aware that WAFLA was publicly providing guidance to growers regarding their responses to the survey. WAFLA's guidance directed respondents to provide information that differed from previous years' survey results, including the following:

- Paying an hourly wage versus piece rate
- Paying specifically \$12.42/hour or \$9.47/hour
- Paying a bonus to "all," "varies," or "most" but to leave the dollar amount blank
- Requiring workers to have at least "3" months or "one season" of previous experience
- Checking worker references
- Not providing free housing for non-working family members

ESD took note of this, and worked with WSU to better support respondents' full understanding of the purpose and intent of the survey questions and their ability to provide accurate responses.

Preliminary analysis

ESD began our preliminary analysis of the 2015 survey results by looking at responses for orchard crops (i.e., apples, pears and cherries). We began with these crops since we have historical data available for comparison from previous wage and practices surveys, and the largest number of respondents this year reported these crops.

We used three statistical analysis techniques to identify results that differed from previous years' results and determine whether those differing results would impact resulting wage and practices estimates. More specifically, we needed to determine whether any differing results appeared to be based on guidance provided by WAFLA, and, if so, whether those would impact resulting estimates.

First, we ran a t-test to see whether there was a statistically significant difference in responses between the 2013 and 2015 surveys concerning wages. We found a statistically significant difference between hourly and piece rate responses between the two surveys, consistent with guidance provided by WAFLA. We found no statistically significant difference on responses regarding bonuses with the exception of cherries. Employers who hired seasonal or migrant workers to harvest cherries were more likely to report a bonus in 2015 than in 2013. However, we found no statistically significant evidence that cherry growers were influenced by WAFLA's instructions on the bonus rate question.

Next, we used a technique called Next Nearest Neighbor Hot Deck Imputation (NND) to analyze the estimated percentage of respondents who appeared to be influenced by WAFLA's guidance. To use NND, we separated the results for each crop (apples, pears and cherries) into their own data set and removed responses without any reported wage unit (e.g., hourly, per bin).

The NND method uses an "ideal" survey response record – in this case, one with six responses specifically encouraged by WAFLA's guidance – and then uses that record to flag matching responses across the data set. The NND method runs this process many times. The more iterations the NND goes through, the more precise the estimate. In this case, we ran the code 1,000 times. The output was a percent interval estimate of respondents, by crop, most identical to the "ideal" record. The average of the upper and lower bound is the percent estimate of responses that we can reasonably conclude were influenced by WAFLA's guidance.

Our analysis indicates that between 5.52 and 8.71 percent of apple, 1.17 and 2.92 percent of cherry, and 3.16 and 5.71 percent of pear grower responses were influenced by WAFLA guidance. We have not yet estimated WAFLA's influence on respondents who reported for row and nursery crops.

For apples, there was also a statistically significant difference in the proportion of hourly workers reported to be paid the minimum wage or the adverse effect wage rate (AEWR) between the 2013 and 2015 surveys. However, there was not a statistically significant difference in the proportion of hourly workers reported to be paid the minimum wage or the AEWR between the 2013 and 2015 surveys for pear and cherry harvest.

Lastly, we calculated preliminary estimates of prevailing wage rates for apple harvest, by variety, using two different methods. We chose to use two different methods as an internal check that our calculations were yielding reliable results.

The first set of estimates were completed using a raking algorithm. The raking algorithm uses data from the U.S. Department of Agriculture’s National Agricultural Statistics Service (NASS) to weight survey responses. The algorithm adjusts survey responses to account for the fact that some groups of employers are under-represented in the survey. In particular, employers with smaller farms and employers who hire fewer than 10 migrant or seasonal workers were under-represented.

The raking algorithm weights respondents in these under-represented groups higher than it weights respondents in over-represented groups. We used the raking algorithm to estimate preliminary prevailing wage rates for apple harvest, by variety, both with and without the respondents that appeared to be following WAFLA’s guidance. *Figure 1* presents our preliminary apple harvest prevailing wage estimates, both with and without respondents we identified as likely influenced by WAFLA’s guidance.

When respondents who were likely influenced by WAFLA are removed from the sample, the prevailing wage rates for harvest all apples is a piece rate. When the flagged respondents are included, the prevailing wage rates for Fuji, Golden Delicious and Granny Smith are an hourly rate.

Figure 1: Preliminary apple harvest prevailing wage estimates using the raking algorithm

Variety	With influenced responses		Without influenced responses	
	Wage rate	Wage unit	Wage rate	Wage unit
Fuji	\$9.47	Hour	\$28.00	Bin
Golden Delicious	\$9.47	Hour	\$23.00	Bin
Granny Smith	\$9.47	Hour	\$23.00	Bin
Braeburn	\$20.00	Bin	\$20.00	Bin
Gala	\$23.50	Bin	\$23.50	Bin
Honey Crisp	\$25.00	Bin	\$25.00	Bin
Pink Lady	\$25.00	Bin	\$25.00	Bin
Red Delicious	\$20.00	Bin	\$20.00	Bin
Other varieties	\$18.00	Bin	\$18.00	Bin

We produced the second set of estimates with the NND algorithm we used to identify respondents who were likely influenced by WAFLA. We ran the algorithm 1,000 times, which created 1,000 lists of respondents who matched WAFLA’s preferred survey response. After further testing we determined that using this approach, respondents who likely followed WAFLA’s guidance were flagged and removed in 87 percent of the 1,000 NND prevailing wage rate simulations. This means that flagged respondents influenced the prevailing wage rate estimates for apple harvest in 13 percent of our NND simulations, but were excluded from our estimates in 87 percent of our simulations.

We then identified the most common pay unit across all of the 1,000 NND simulations. Once we identified the most common pay unit—which we determined to be a bin rate—we took the median pay rate of each simulation in which the bin rate was the prevailing pay unit. Finally, we took the median of all the simulations in which the bin rate was the prevailing unit of pay to estimate the preliminary prevailing wage rates for apple harvest. *Figure 2* presents our preliminary apple harvest prevailing wage estimates using the NND simulations.

Figure 2. Preliminary apple harvest prevailing wage estimates using 1,000 NND simulations

Variety	Wage rate	Wage unit
Fuji	\$28.00	Bin
Golden Delicious	\$23.00	Bin
Granny Smith	\$23.00	Bin
Braeburn	\$20.00	Bin
Gala	\$25.00	Bin
Honey Crisp	\$25.00	Bin
Pink Lady	\$25.00	Bin
Red Delicious	\$20.00	Bin
Other varieties	\$18.00	Bin

Next steps

Complete prevailing wage rates and practices estimates

ESD will complete our analysis by January 31, 2016. The completed products will include the analysis we have completed so far as well as a calculation of estimated prevailing practices for orchard crops and estimated prevailing wage rates and practices for row and nursery crops. These analyses will also include estimations of the influence of WAFLA's guidance.

Continue conversation with DOL regarding introduction of bias into survey

ESD has already alerted DOL to the issues raised here concerning the introduction of bias into the survey results, stemming from the actions taken by WAFLA. ESD will continue to update DOL as we continue our analysis, including sharing our methodology for estimating, and controlling for, bias. We will need DOL's instruction in determining the wage rates and practices that we ultimately report based on the survey results.

Begin the discussion around survey improvements

ESD intends to use the information learned through our analysis of the 2015 survey results to make purposeful changes for the 2016 survey. Similar to this year, stakeholder groups will continue to have the opportunity to provide feedback throughout that process.

Contact

Cynthia Forland, Director, Labor Market and Performance Analysis,
(360) 407-4503/cforland@esd.wa.gov