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Leave or Stay: The Role of Non-Pecuniary Benefits in H-2A Workers' Willingness to Remain in Agriculture

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Abstract

We interviewed a sample of H-2A workers and applied an attribute-based DCE to estimate the WTA for job amenities. Overall results indicate that H-2A workers surveyed favor working as many hours as possible and the opportunity to earn over time payment, compared to being limited to work 40 h/week. Respondents value training opportunities, with English training being valued higher than machinery training. Housing amenities such as wireless internet connection, a common outdoor area, a small refrigerator to improve house comfort, and proximity to towns are valued by respondents. The opportunity to take short vacations -the opportunity to return home to visit family for a limited amount of time during the year, in a time that work intensity has decreased, and the worker will cover travel costs- is also highly valued by respondents.
This study has useful policy implications to address the the non-pecuniary aspects of job. Low-cost amenities such as training and taking short vacations are highly valuable to workers. Further, results from this study provide cues to policymakers to introduce modifications in the H-2A program. The small sample of 154 H-2A workers is a limitation to this study (154 out of 28,727; 0.54%). Important to consider is how contentious labor is to Washington agricultural operations and how difficult is to have companies agree to conduct this type of research.

Keywords: farmworkers, H-2A program, non-pecuniary benefits, random utility models

JEL codes: Q18

Introduction

Farm labor shortages have been one of the main sources of concern among growers of labor-intensive crops. The problem has been present for many decades in agricultural labor markets (Taylor et al., 2012; Hertz and Zahniser, 2012; Martin, 2018; Charlton and Taylor, 2016; Taylor and Charlton, 2018; Gallardo and Sauer, 2018), and became more apparent to the general public during the COVID-19 pandemic when farmworkers were deemed essential. Limited labor availability threatens the livelihoods of farmers and farmworkers alike, the economies of rural communities, and the economic opportunities of Hispanics and other minority groups. In addition, labor shortages (and the induced mechanization associated with them) have the potential to increase industry concentration, average farm size, and could put at risk the food security of the nation as the country transitions to importing rather than producing labor-intensive agricultural commodities.

The shortage of farmworkers has led to increased farm wages in real absolute terms and relative to other occupations. Policies like the H-2A visa program have been developed to facilitate access to foreign agricultural workers, and there have been recent proposals to update and modify the program. Despite wage increases and public policy measures, the problem of agricultural labor scarcity persists and has continued to worsen. While previous work has investigated some of the aggregate factors impacting the farm labor supply (like immigration trends and mechanization), little is known about the role played by incentives at the individual level for farmworkers and farmers alike.

In this paper, we investigate the determinants of workers' decisions to engage in agricultural work, considering both monetary and non-pecuniary incentives. One of the main contributions of our study is that we do not rely on existing aggregate-level farmworker data. Instead, we directly obtain microdata from in-person interviews with farmworkers in Washington state. Specifically, we study the job choice decisions of H-2A workers. Our results shed light on the value H-2A workers assign to some of the job perks they receive. This is of interest given the recent discussions motivated by projects like the Farm Work Force Modernization Act, which could

substantially change the rules and regulations associated with hiring domestic and international farmworkers.

Studying the role of incentives in helping farmers recruit and retain agricultural workers is important, given the competition for labor that growers face from other industries. Construction, in particular, offers an opportunity for workers as the skillset demanded by developers is similar to what farmworkers provide. In addition, some states where agriculture has been an important part of the economy are experiencing rapid urban growth that has increased the demand for buildings and hence construction workers (Gutierrez-Li, 2021). Data from the U.S. Bureau of Labor Statistics shows that, in 2021, the mean hourly wage of an agricultural worker was $17.88 and the mean annual wage was $37,190. In comparison, mean hourly wage in construction for the same year was $21.22, and the mean annual wage was $44,130. While wages influence workers' decisions, working conditions and other non-pecuniary benefits have been shown to also affect occupational choices (Cassar and Meier, 2018).

Using a discrete choice experiment involving farmworkers, our results indicate that H-2A workers surveyed favor working as many hours as possible. Respondents value training opportunities, with English training being valued higher ($10.53/925-lb bin) than machinery training ($7.59/925-lb bin). Housing amenities such as wireless internet connection, a common outdoor area, a small refrigerator to improve house comfort, and proximity to towns are valued by respondents ($9.68/925-lb bin). Also, the opportunity to take short vacations; i.e., the opportunity to return home to visit family for a limited amount of time during the year when work intensity is relatively low and the worker will cover travel costs is also highly valued by respondents ($10.44/925-lb bin).

Related Literature

Our paper contributes to several strands of literature. Most notably, we add to other work that has studied the factors that explain farm labor shortages. Some of these include an increase in border enforcement (Kostandini et al., 2014), economic growth in Mexico –the primary source country of workers (Hanson, 2006), the change in the location decisions of farmworkers, with less

migration to follow jobs in different crops (Fan et al., 2015), the aging of the current agricultural workforce (Taylor and Charlton, 2018), and effects of temporal worker migrant programs (H-2A) effects on regional U.S. labor (Brady et al., 2016).

We also contribute to recent work studying factors affecting the engagement of local workers in agricultural tasks. Even in periods of high unemployment, only a few native-born workers are attracted to agriculture (Richards, 2018; Luckstead et al., 2022). Other researchers have documented how economic growth in Mexico has encouraged agricultural workers to transition to other sectors like services, which has led to higher agricultural wages in Mexico and reduced the incentives to move north as expected incomes in the United States relative to earnings at home decline (Kennan and Walker, 2011; Lessem, 2018). The literature has also documented the agricultural sectors that are most affected by farmworkers' reduced availability. For example, sectors like specialty crops or livestock rely heavily on labor. For the green industry[1] as well as fruit-producing farms, labor constitutes a large share of total costs that can be as high as 35% (ERS, 2022). More specifically, for apples, labor represents on average, 32% of total costs in the field (Gallardo and Galinato, 2021, 2020a, 2020b, 2020c, 2020d).

Our empirical approach borrows from the discrete choice (DCE) literature that is applied in agricultural economics, transportation economics, health economics, and environmental economics. The literature is vast. Some examples of DCE food-product attributes literature include Loureiro et al. (2001), who find that environmentally minded, food-safety-minded, and larger families are more willing to purchase eco-labeled, organic, and regular apples, respectively. Li et al. (2002) shows that Chinese consumers in Beijing are willing to pay 38.0% and 16.3% more for GM rice and soybean oil than non-GM products. Vlaeminck et al. (2016) show that Belgium consumers will pay about 31% more for fair-trade label chocolate, while Luckstead et al. (2021) find that Belgian, US, UK, and French consumers will pay 7.75%, 9.00%, 14.54%, and 16.04% more, respectively, for child-labor-free chocolate. Studying beet sugar in Milan, Ruggeri et al. (2021) find consumers will pay a 28% price premium for fair-trade sugar. For a full review of this extensive literature, see McCluskey and Loureiro (2003). While

[1] The term includes businesses involved in the production and commercialization of ornamental plants, garden supplies, and landscaping.

our paper is related to the willingness to pay (WTP) for food-product attributes literature, we utilize DCE to examine H-2A workers' willingness to accept (WTA) job attributes.

Research on WTA job offers in non-agricultural sectors has examined the impact of job attributes (Abraham et al., 2013), quality of communication (Cable and Graham, 2000), quality of communication of traditional benefits (e.g., disability insurance, health insurance, retirement funding, and life insurance) and non-traditional benefits (Jennings et al., 2003), and homogeneity in a community (Noe and Barber, 1993) on the of acceptance of job offers and location decisions. In the case of the food sector, Luckstead et al. (2022a) considered the impact of job attributes on US low-skilled workers' willingness to accept meatpacking jobs during the COVID-19 pandemic. Our paper is different in that we focus on the decisions of immigrant, rather than American, agricultural workers.

Lastly, our study is directly related to the contingent employment literature. This is an extensive literature that has examined topics related to temporary workers' loyalty to their employer, job satisfaction, the choice for fixed-term employment, safety issues, work-family conflicts, and the impact of worker attitudes on performance (Connelly and Gallagher, 2004; De Cuyper et al., 2008). Furthermore, transitioning from contingent to permanent employment is more likely when the employee does not intend to be temporarily employed, is financially secure, is a minority, is married, is well educated, in an agricultural position, or has a pension plan. Extending the contingent employment literature into the agricultural sector, Luckstead et al. (2022b) examine the impact of job attributes and COVID-19 on US domestic workers' willingness to accept fixed-term agricultural field jobs. Since H-2A workers are becoming the primary supply of low-skilled workers in labor-intensive agricultural production, our paper adds to this literature by developing a DCE to examine immigrant workers' willingness to accept job attributes in fixed-term agricultural field jobs.

Data

We chose to target H-2A workers, harvesting apples in Washington state for two reasons. First, the number of H-2A-certified jobs in the United States has increased by 370%; from 79,000 in

2010 to 372,00 in 2022. As of 2022, 50% of the total H-2A workers coming to the United States are concentrated in five states: Florida, California, Georgia, Washington, and North Carolina (Rural Migration News, 2023). The share of these five states has increased from 34% in 2007 to 50% in 2022, mainly due to the significant increase in California and Washington (Rural Migration News, 2022). In Washington alone, the number of H-2A-certified workers grew 467%, from 5,068 in 2011 to 28,727 in 2021 (Washington State, Employment Security Department, 2022). We also focus on apple operations because this specific crop industry is the most economically important and the one that absorbs most workers in Washington State (Washington State Department of Agriculture, 2023; Washington State, Employment Security Department, 2022)

A paper survey including an attribute-based discrete choice experiment (DCE) was applied to a sample of H-2A-certified workers in Washington state. With the help of Washington State University (WSU) extension faculty, we reached out to at least ten specialty crop operations (apple); three allowed their H-2A workforce to be surveyed. An incentive of $10 in cash was offered to each potential survey respondent. Among the three companies, we had the opportunity to reach out to 210 workers. However, due to printing errors when administering the paper survey, we were able to only use 154 of these responses. Because the entire population of H-2A workers in these companies was from Mexico, and Spanish was their first language, the survey was written in Spanish. The survey was approved by Washington State University IRB #19463.

Before the implementation, researchers coordinated with field supervisors of each company on a date, time, and place where the survey would be implemented. The survey took place in all three instances at the H-2A housing of each company from the last week of September to the first week of October 2022. Survey participants in each company were divided into groups of approximately 30 individuals. The lead researcher verbally communicated the survey's goals in Spanish to the participants. Next, each question on the survey was read and explained to respondents. Then we requested participants to respond to each question. Once a survey was filled, researchers checked for completeness and handled participants the $10 cash incentive.

The DCE's goal was to elicit the willingness to accept (WTA) different H-2A job attributes; that is, to determine the monetary value of the non-pecuniary aspects of an H-2A job offer. A written "cheap talk" statement was included when explaining the questions to survey participants. An efficient design with empirical priors was generated in Ngene. The final design consisted of 12 choice tasks, with a D-error of 0.2618.

Each choice task consisted of two H-2A job offers and an opt-out. Each job offer presented a random combination of four job attributes (hereafter amenities) and four salary levels. The survey explained each of these amenities, and the lead researcher also explained each of these amenities verbally when presenting the survey to respondents. Table 1 includes each of these amenities, an explanation for each, and the levels. The amenities and their levels included were carefully selected based on previous research (Luckstead et al., 2022), personal interviews with WSU extension faculty working on labor issues, Washington agricultural principal operators who work with H-2A-certified workers, and the information on the Washington Department of Labor website. The amenities include housing amenities, training opportunities, the opportunity to take short vacations, and the opportunity to get paid overtime. The wage paid for harvest varies according to the variety of apples being harvested. The variety dictates how many apples are ready to be picked per tree at one point in time. The Gala variety was chosen because this is the most popular in terms of shipment volume variety in Washington state (Gallardo and Galinato, 2021). The more apples in the tree will positively impact the payment received by workers because, in most instances, the harvest pay is on a piecemeal basis. The type of horticultural planting (for example, a two-dimensional fruit wall with six wires) influences the number of apples, and the ease of reaching more apples influences the final payment. Most workers have expectations of the pay they will receive according to the orchard setting. The unit of the wage is dollars per bin. In Washington state, the unit to measure the amount of apples harvested by pickers is a bin. The precise size and material of the bin varies across apple operations. In this paper we use the measures in Gallardo and Galinato (2021), where a bin is made of wood and has a capacity of 925 lbs.

In addition to the DCE, respondents were asked job-related questions such as how long the current employer has employed them, how the payment is calculated, what the pay is for harvesting Gala apples, what benefits their employer currently offers, what type of job they are

currently performing, if training to learn new skills would be a factor when choosing one farm employer over another, would a retention bonus be a factor to choose one farm employer over another, the length of the commute to work, and if they have ever worked in agriculture before. Sociodemographic questions were also asked. These included age, the highest level of education completed, how many adults are part of the household, how many children under the age of 18 live in the household, gender, ethnicity, residency status, number of people that share H-2A residency, number of hours actually paid out of the total hours stipulated in the contract, if concerned to get H-2A visa renewed, level of difficulty of obtaining H-2A visa, level of confidence H-2A will be renewed, and if they feel that wages in home country are increasing faster, slower or similar compared to the United States.

Empirical Approach

Attribute-based discrete choice experiments are based on the Consumer Theory by Lancaster (1966) and Random Utility Theory by McFadden (1974). Given our proposed experiment, a job offer consists of a bundle of both wage and non-wage attributes from which a rational farmworker derives utility from. The probability that a farmworker chooses to accept an offer is higher if the utility derived from the attributes of a field job is the highest among various employment alternatives. Specifically, the utility U that farmworker n obtains by choosing field job i from a limited set of j alternatives in choice situation t is:

$$U_{nit} = \alpha' X_{nit} + e_{nit}$$

where $\alpha' X_{nit}$ is the linear deterministic component, α' is a parameter vector, X_{nit} is a vector of field-job attributes, and e_{nit} is a white noise error term. We utilize a Random Parameters Logit (RPL) model as our preferred choice because, as discussed in Train (2009), the Independence from Irrelevant Alternatives property is not always appropriate and preference heterogeneity can occur. With our proposed survey design, the job-attribute vector, X_{nit} contains a wage rate (W_{it}) that represents one of four values; a binary variable for housing amenities (H_{it}); training opportunities in machine operations and English classes (T_{it}); a binary variable for vacation time (V_{it}); and three options for overtime pay (O_{it}). For the RPL model, utility is specified as:

$$U_{nit} = A_n + \alpha_W W_{it} + \alpha_{H,n} H_{it} + \alpha_{T,n} T_{it} + \alpha_{V,n} V_{it} + \alpha_{O,n} O_{it} + L\mu_n$$

where A_n is the alternative-specific constant representing the respondents's current job bundle, L is the lower triangular matrix of the Cholesky decomposition matrix, and μ_n is distributed standard normal. In order to directly estimate marginal WTA instead of marginal utility, the utility function is reparametrized as below:

$$\begin{aligned} U_{nit} &= A_n + \alpha_W W_{it} + \alpha_{H,n} H_{it} + \alpha_{T,n} T_{it} + \alpha_{V,n} V_{it} + \alpha_{O,n} O_{it} + L\mu_n \\ &= \alpha_W W_{it} + X_{it}^T \beta + L\mu_n \\ &= \alpha_W W_{it} + X_{it}^T (\alpha_W \frac{\beta}{\alpha_w}) + L\mu_n \\ &= \alpha_W (W_{it} + X_{it}^T \gamma) + L\mu_n \end{aligned}$$

where X_{it} stands for all non-wage attributes, β is the parameter vector of non-wage attributes, γ is the WTA parameter vector. We estimate all WTA space RPL models using the Multinomial Logit models with random parameters "gmnl" package in R with 500 Halton draws for the simulation considering the panel structure of the data (Sarrias et al., 2017).

Results

Table 2 presents the frequency distribution of respondents' sociodemographics. Salient characteristics include 56% of the respondents completed high school, and 24% completed technical or vocational school. Considering that 99% of the H-2A workers in our sample come from Mexico, we compare some demographics with the Mexico Census. In 2020, the average number of schooling years in Mexico was 9.7, which is completed high school (Mexico, INEGI, 2020). Fifty-one percent of the respondents' households had less than four individuals, 27% had no children in the household, and 46% had at least one child. Ninety-seven percent of respondents were male. Eighty-two percent identified as Hispanic or Latino. Nine percent identified as White, and seven percent indicated they are mixed race. The average age of survey respondents is 31, which is close to Mexico population average age at 29 years (Mexico, INEGI, 2020).

Job related responses are presented in Table 3. Forty-two percent of respondents stated they worked for the same company for three seasons or more than 24 months; indicating they are experienced with the H-2A program, as only 13% of them have worked for less than 6 months. Sixty percent of respondents indicated they get paid using a combination of piece and hourly

rate. There is not an overall "benefit" from the current job that participants would emphasize, as 20% indicated is to be assured of guaranteed contract hours, 18% indicated it is vacation time, and 15% said it was house amenities. This shows that payment and the opportunity to have short vacations to return to Mexico and spend time with their families are important.

On the tasks that respondents usually perform, 48% indicated it was harvest, which is understandable as the survey was conducted during harvest season (September-October). Thirty percent indicated that they also do pruning and training of trees. Pruning and training often happen during the Winter months (January-February). This indicates that respondents stayed longer than just the harvest season, which extends from August to November. Seventy percent of the respondents indicated that training is important, and 81% indicated that a retention bonus could be a factor in choosing an employer. During personal interviews with principal operations of apple producing companies, it was mentioned that retention bonus is not typically used in Washington state. Forty-five percent of respondents indicated they live on the site; that is, at the orchard field they usually work. Whereas 55% indicated that they commute. This means they must drive to orchards of the same company located in a different location from the camping site. The company provides transportation for workers to travel between company orchard sites. This is usual in Washington, as the companies usually have different fields located at different locations within the state. Ninety-five percent of respondents indicated that they have previously worked in agricultural field jobs. On housing arrangements, 94% of respondents shared their bedroom with 2-6 individuals. Importantly, 58% of respondents indicated that they work all the hours (no more and no less) as stipulated in their contract. Seventy-three percent indicated some concern that their H-2A visas may not be renewed, and 42% indicated that it was either difficult or extremely difficult to obtain the H-2A visa.

Nonetheless, 44% indicated that they are confident in securing the H-2A visa for the next year. An overwhelming majority, 84% perceived that they feel the wages in Mexico (their home country) increased slower than in the United States. This perception is promising for the long-term sustainability of the H-2A program; as long as the wage differential between the two countries (Mexico and the United States) exists, there will be a demand for H-2A jobs in Mexico.

Willingness-to-accept (WTA) results

WTA results are presented in Table 4. Interestingly, the coefficient of preferring the current job-bundle is positive and statistically significant. This indicates to some extent that respondents are satisfied with their current job conditions. The coefficient of the variables representing "work as many hours as worker and employer agree with no consideration of the number of hours worked during the week", and "for all hours over 40 h/week, earn overtime pay of $2/bin" -in relation to- "work for a maximum of 40 h/week with no overtime opportunity" is positive and statistically significant indicating that respondents favor the opportunity to work for more than 40 h/week either at the same pay rate or earning an overtime payment, rather than limiting the number of hours worked to 40 h/week. Interestingly, the WTA for a job offering the worker to work as many hours as worker and employer agree at the same pay rate is higher than for the opportunity to earn overtime pay for over 40 h/week worked.

Respondents valued training opportunities. The coefficient estimates for all three options of training opportunities are positive and statistically significant. English training was valued higher ($9.278/925-lb bin) than machinery training ($7.655/925-lb bin). As expected, amenities such as wireless internet connection, a common outdoor area, a small refrigerator to improve house comfort, and proximity to towns were valued by respondents ($7.999/925-lb bin). This reflects the importance of the housing amenities provided to workers to enhance morale in the workplace. Also, the opportunity to take short vacations -the opportunity to return home to visit family for a short lenght of time during the year, in a time that work intensity decreases, and the worker covering travel costs- was also highly valued by respondents ($10.583/925-lb bin). This signals the importance to respondents of being close to their families.

The coefficient estimates for scale heterogeneity caused by individual preference of wage and other factors measured by τ, was statistically significant, suggesting the presence of heterogeneity across respondents' choices. The standard deviation of coefficient estimates for overtime pay for all hours over 40/week, the offer of house amenities, and the offer of an opportunity to take short vacations, were statistically significant, indicating respondents' heterogeneity in preferences.

Conclusions

This is the first known study to interview H-2A workers and apply an attribute-based DCE to estimate the WTA job amenities. A paper survey was conducted at three apple-producing companies in Washington State. Overall results indicate that H-2A workers surveyed favor working as many hours as possible and the opportunity to earn over time payment. Respondents value training opportunities, with English training being valued higher than machinery training. Housing amenities such as wireless internet connection, a common outdoor area, a small refrigerator to improve house comfort, and proximity to towns are valued by respondents. Also, the opportunity to take short vacations -the opportunity to return home to visit family for a limited amount of time during the year, in a time that works intensity has decreased, and the worker will cover travel costs- is also highly valued by respondents.

This study reveals the monetary value that H-2A workers put on selected job amenities, such as the opportunity to get overtime payment, training, housing amenities, and taking short vacations to see family. Also interesting is the finding that workers value the opportunity of learning new skills, such as English, and operating a piece of new machinery. Being close to family is important to H-2A workers; therefore, the opportunity to take short vacations to see the family is highly valued. This study has useful policy implications as how valuable the non-pecuniary aspects of a job offer are. Low-cost amenities such as training and taking short vacations are highly valuable to workers. Further, results from this study provide cues to policymakers to introduce modifications in the H-2A program. The small sample of H-2A workers we could reach is a limitation to this study (154 out of 28,727; 0.54%). Important to consider is how contentious labor is to Washington agricultural operations and how difficult is to have companies agree to conduct this type of research. Future research must expand the sample size of respondents, including other states, other agricultural crops, and domestic workers.

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Table 1. Amenities and levels included in each discrete choice scenario.

Attribute	Attribute explanation	Attribute levels
Housing amenities	The employer provides additional amenities in the form of free Wi-Fi, outdoor common area, small refrigerator to improve housing comfort, and proximity to towns	1. Yes: The company offers amenities 2. No: The company does not offer any amenities
Training opportunities	The employer will provide tractor operator training, as for example, machinery operation or English language classes during non-working hours	1. No 2. Training in machine operation (i.e. Tractor) 3. Free English classes 4. Machine operator training (i.e. Tractor) and free English classes
Opportunity to take short vacations	You will have the opportunity to return home to visit your family for a limited amount of time during the year, but in a time that work intensity has decreased. The travel will be at your own expense	1. No: The company does not offer an opportunity to take short vacations 2. Yes: The company does offer an opportunity to take short vacations
Opportunity to get paid for overtime	Washington State legislators have implemented overtime pay laws for agriculture.	1. You can work as many hours as you and your employer agree to – there is no consideration of the number of hours worked during the week 2. You can only work a maximum of 40 hours per week – there is no opportunity to work overtime 3. For all hours over 40 in a week, you will earn overtime pay of $2 per bin
Wage	The two job offers also vary in the amount of pay for harvesting a box of apples. Consider that we assume a block of Gala apples, first-round color pick, uniform color, vertical trellis with 6 wires. The payment is by contract and uses ladders	1. $33.06 per bin 2. $28.62 per bin 3. $23.46 per bin 4. $18.66 per bin

Table 2. Frequency distribution of survey responses – Sociodemographics.

Demographic	Percent of respondents N=154
Education	
None	1
Primary school	12
High school	56
Career school (technical or vocational school)	24
Undergraduate university degree (bachelor's degree)	5
Graduate university degree (master or doctoral degree)	0
Did not respond	2
Number of adults in the household	
1	13
2	21
3	17
4	14
5	8
More than 5	24
Mixed responses	3
Did not respond	1
Number of children in the household	
0	27
1	14
2	32
3	11
4	10
5	1
More than 5	1
Mixed responses	2
Did not respond	3
Gender	
Male	97
Female	1
Did not respond	2
Primary residence	
Mexico	99
Other	1
Ethnic background	
White	9
Hispanic or Latino	82
Mixed race	7

Prefer not to say/did not respond	2
	Mean (Standard deviation)
Age	31 (7.078)

Table 3. Frequency distribution of survey responses. Job-related questions.

	Percent N=154
Length of time employed	
Less than 3 months	3
3-5 months	10
6-8 months	18
9-11 months	17
12 months	0
2 seasons (between 12 and 24 months)	6
3 seasons or more (more than 24 months)	42
Mixed responses	3
Did not respond	1
How pay is calculated	
Piece wage	27
Hourly rate	9
Combination of piece and hourly rate	59
Mixed responses	3
Other responses	2
Benefits for current job	
Guaranteed contract hours	19
Vacation time	18
Housing amenities	15
Retention bonus	11
English language classes	10
Employer treats me better	8
Tractor operator training	7
Employment for a longer period of time	7
Orchard has more apples and they all color uniformly	5
None of the above	1
Task in current job	
Apple harvest	48
Pruning and training trees	33
Other	9
Tractor driver	6
Forklift driver	3
Truck driver	1
Checker	1
If training is a factor in choosing employer	
Yes	77
No	21

Other	2
If retention bonus be a factor in choosing employer	
Yes	81
No	17
Other	2
Length of commute to work	
Live on site	45
Less than 20 minutes	26
21 to 40 minutes	17
41 to 60 minutes	5
61 minutes or more	5
Mixed responses	2
Have worked in an agricultural field job	
Yes	95
No	3
Did not respond	2
How many people share the bedroom	
No one, just me	0
2-6 people	94
7 or more people	5
Did not respond	1
How many hours from what your contract says, do you actually end up working, on average	
Half	1
Three-quarters	12
All	58
More than specified in the contract	9
I don’t know, I don’t count the hours I end up working	19
Mixed responses	1
If concerned to not obtain an H-2A visa	
Yes	73
No	25
Other responses	2
How difficult is to obtain H-2A visa	
Extremely difficulty	8
Difficult	34
Neutral	34
Easy	20
Extremely easy	3

How confident to secure H-2A next year	
Extremely confident	6
Confident	44
Neutral	15
Not confident	29
Extremely confident	3
Mixed responses	3
Did not respond	1
Wages in my home country are increasing	
Faster than in the United States	8
Similar to in the United States	6
Slower than in the United States	84
Did not respond	2

Table 4. Coefficient estimates of the willingness to accept (WTA) space model.

Variable	Coefficient estimate	Standard error
Mean		
Prefer current job bundle – Neither alternative presented	10.213***[a]	2.236
Work as many hours as worker and employer agree[b]	6.210***	0.895
For all hours over 40/week, earn overtime pay of $2 per bin[b]	1.946**	0.886
Training in machine operation (i.e., Tractor)[c]	7.655***	0.986
Free English classes [c]	9.278***	1.708
Machine operator training (i.e., Tractor) and free English classes [c]	10.184***	1.18
The company offers housing amenities[d]	7.999***	0.71
The company offers an opportunity to take short vacations[e]	10.583***	0.742
Scale heterogeneity	-0.970***	0.289
Standard deviation		
Work a max. of 40 h/week – there is no overtime opportunity	1.138	1.408
For all hours over 40/week, earn overtime pay of $2 per bin	2.709***	0.782
Training in machine operation (i.e. Tractor)	0.377	1.508
Free English classes	1.268	2.759
Machine operator training (i.e., Tractor) and free English classes	1.611	1.245
The company offers housing amenities	10.614***	1.196
The company offers an opportunity to take short vacations	6.91***	0.892
Tau	-1.897***	0.208
Number of observations	1,848	
Log likelihood	-1,367	
Akaike Information Criterion	2,768	
Bayesian Information Criterion	2,862	

[a] *, **, *** indicates statistical significance at the 10%, 5%, and 1% levels. [b] Relative to "Work a max. of 40 h/week – there is no overtime opportunity." [c] Relative to "No training opportunity." [d] Relative to no offer of housing amenities. [e] Relative to no opportunity to take short vacations.

APPENDIX A. Discrete choice experiment, instructions, description, and example of a scenario.

INSTRUCTIONS and JOB DESCRIPTION: DO NOT MARK ON THIS PAGE

In the following pages, we'll ask you to answer 12 scenarios about different job offers harvesting apples.

PLEASE CONSIDER THAT THESE QUESTIONS ARE PART OF AN ACADEMIC STUDY WHOSE ONLY OBJECTIVE IS TO HEAR FROM YOU. THESE QUESTIONS DO NOT IMPLY UNDER ANY CIRCUMSTANCE THAT THE COMPANY IS OBLIGATED TO OFFER WHAT IS DESCRIBED IN EACH SCENARIO

Each scenario has THREE options: Option 1 and option 2 describe the job offers on apple harvesting with various advantages and disadvantages, the option 3 is not to accept any of the two offers presented. We ask if you could please select only ONCE of the three options presented.

It is very important that you select the job offer that will be the closest to the one you would choose in real life.

Next, we provide a job description and details of the job offers you will consider in each of the job scenarios in the following pages. The information presented next is just the description, the choice task for you to choose comes after this description.

THIS IS A DESCRIPTION OF THE JOB OFFERS TO BE PRESENTED IN THE SCENARIOS. DO NOT MARK NOTHING YET.

Job Description:

- Throughout the survey, we will refer to jobs as agricultural field work. Duties primarily pertain to apple harvesting for a Gala block with first-round color pick with a vertical trellis with 6 wires. Only ladders will be used.
- Each of the 12 job offer scenarios apply to the block of Gala (first-round color pick with a vertical trellis with 6 wires). Each scenario varies in the perks and the payment.

Perks to consider

- Perk 1: Housing amenities
  The employer provides additional amenities in the form of free Wi-Fi, outdoor common area, small refrigerator to improve housing comfort, and proximity to towns. There are two potential options:
  1. Yes: The company offers amenities
  2. No: The company does not offer any amenities

- Perk 2: Training opportunities
  The employer will provide tractor operator training, as for example, machinery operation or English language classes during non-working hours. There are options:
  1. No
  2. Training in machine operation (i.e. Tractor)

3. Free English classes
4. Machine operator training (i.e. Tractor) and free English classes

- Perk 3: Opportunity to take short vacations
  You will have the opportunity to return home to visit your family for a limited amount of time during the year, but in a time that work intensity has decreased. The travel will be at your own expense. There are two potential options:
  1. No: The company does not offer an opportunity to take short vacations
  2. Yes: The company does offer an opportunity to take short vacations

- Perk 4: Opportunity to get paid for overtime
  Washington State legislators have implemented overtime pay laws for agriculture. There are three potential options for overtime pay:
  4. You can work as many hours as you and your employer agree to – there is no consideration of the number of hours worked during the week
  5. You can only work a maximum of 40 hours per week – there is no opportunity to work overtime
  6. For all hours over 40 in a week, you will earn overtime pay of $2 per bin

- Perk 5: Wage
  The two job offers also vary in the amount of pay for harvesting a box of apples. Consider that we assume a block of Gala apples, first-round color pick, uniform color, vertical trellis with 6 wires. The payment is by contract and uses ladders. There are four potential wage levels:
  5. $33.06 per bin
  6. $28.62 per bin
  7. $23.46 per bin
  8. $18.66 per bin

Assume all other aspects of the jobs are the same.

Job Offer Scenarios

Based on the above explained circumstances, you will be presented TWELVE scenarios of job offers, each scenario presents two options, option A and option B that vary in different perks; and the option C that is I will not choose option A nor option B.

PLEASE CONSIDER THAT THESE QUESTIONS ARE PART OF AN ACADEMIC STUDY WHICH ONLY OBJECTIVE IS TO HEAR FROM YOU. THESE QUESTIONS DO NOT IMPLY UNDER ANY CIRCUMSTANCE THAT THE COMPANY IS OBLIGATED TO OFFER WHAT IS DESCRIBED IN EACH SCENARIO

Please select only one of the three options for each scenario, select either Option A, or Option B or Option C.

Please consider responding as close as you would in real life.

EXAMPLE SCENARIO:

	Option A	Option B	Option C
Wage for contract ($ per bin) Gala block, first pick of the season, all apples are uniform colored, they have a vertical trellis system with 6 wires. Use ladder.	$28.62	$23.46	Neither A nor B
Opportunity to pay for overtime	You can work as many hours as you and your employer agree to – there is no consideration of the number of hours worked during the week	You can only work a maximum of 40 hours per week – there is no opportunity to work overtime	
The job offers additional training and free lessons	No	Tractor operator training	
The job offers housing amenities	Yes	No	
The job offers an opportunity to take short vacations	No	Yes	
Select only one option (Put an "X" in the space corresponding to the chosen option, or A, or B, or C)	X		

Job Scenarios

1. Considering the above circumstances, which of the following options would you choose?

	Option A	Option B	Option C

Wage for contract ($ per bin) Gala block, first pick of the season, all apples are uniform colored, they have a vertical trellis system with 6 wires. Use ladder.	$23.46	$28.62	
Opportunity to pay for overtime	You can work as many hours as you and your employer agree to – there is no consideration of the number of hours worked during the week	You can only work a maximum of 40 hours per week – there is no opportunity to work overtime	Neither A nor B
The job offers additional training and free lessons	No	No	
The job offers housing amenities	Yes	Yes	
The job offers an opportunity to take short vacations	No	No	
Select only one option (Put an "X" in the space corresponding to the chosen option, or A, or B, or C)			