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Pre-employment costs associated with H-2A agricultural workers and the effects of the ‘60-minute rule’

RESEARCH ARTICLE

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Abstract

Agricultural employers increasingly are turning to the foreign guest worker program, known as H-2A, as a means to secure a legal workforce. This paper outlines the procedural aspects and costs of recruiting and hiring H-2A workers. Cost data is from a 2014 survey of citrus harvesters and defines pre-employment costs as filing fees, advertising, surety bonds, travel, and housing. The pre-employment costs associated with guest workers are estimated to be nearly \$ 2,000 per worker. The survey was motivated by the ‘60-minute rule’ imposed by the U.S. Department of Labor prior to the 2012-13 citrus harvesting season. Cost data were collected across two crop season, 2012-13 and 2013-14, to analyze the cost implications of the rule. We found that the 60-minute rule significantly increased filing fees. These fees, however, represent a very small share of total costs and overall pre-employment costs associated with the H-2A program did not significantly change.

Keywords: farm labor, guest workers, citrus harvesting

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1. Introduction

Fruit and vegetable growers in the United States depend on a significant number of workers to grow and harvest their crops. On average, 42% of variable production costs for U.S. fruit and vegetable producers are attributable to labor (Calvin and Martin, 2010). This observation is particularly relevant to Florida's citrus industry, where every piece of fruit is harvested by hand (Roka, 2013). A shrinking supply of domestic workers and more aggressive enforcement of U.S. immigration laws have pushed Florida citrus growers to recruit an increasing number of foreign agricultural guest workers through the H-2A visa program (Taylor, 2010; Taylor and Charlton, 2012). During the 2014-15 season, more than 50% of Florida citrus crop was harvested by foreign guest workers hired through the H-2A program (M. Carlton, Director of Labor Relations, Florida Fruit and Vegetable Association, personal communication 2015).

H-2A workers can be hired directly by growers or by licensed farm labor contractors (FLCs). FLCs are employers and historically have provided most of the labor to harvest Florida's citrus production. Prior studies indicate that many FLC's are either recent immigrants or at least share the language and cultural background with the workers they supervise (Huffman, 2005). As the H-2A program has expanded many FLCs have leveraged their knowledge of Mexican and other Central American labor markets to become employers of H-2A workers.

This article provides an updated perspective on how citrus growers navigate the H-2A recruitment process and how they manage pre-employment expenses associated with recruiting and hiring foreign agricultural workers. We report and interpret the findings from a 2014 survey of licensed FLCs. The survey was motivated by a change in the U.S. Department of Labor's (DOL) definition of 'area of intended employment' for which individual petitions are based. Prior to 2012, the 'area of intended employment' was not precisely defined within the H-2A program rules. In 2012 the DOL removed this ambiguity by defining the 'area of intended employment' to be no greater than a 60-minute commuting radius from the employer's H-2A housing facility. The rule pertained only to employers who were FLCs. Growers who directly hire H-2A workers were not affected by the 60-minute rule.

Many FLCs have been participating in the H-2A program since 2009 and they harvest citrus over a wide area of Florida. For the most part, these FLCs establish a single housing area, and while they attempt to find a geographically central housing location, in some cases their harvesting contracts force them to transport workers longer than a 60-minute commute. The 60-minute rule requires these FLCs to either cancel harvesting contracts with growers outside the 60-mile radius, or set-up separate housing facilities to keep all commuting distances to be less than 60 minutes. Since H-2A petitions are tied to a single housing location, expanding the number of housing facilities to a second or third location would force FLCs to submit additional petitions. FLCs assert that the 60-minute rule would significantly increase their costs of using the H-2A program.

The objectives of the 2014 survey were two-fold. First, to document pre-employment costs associated with the H-2A program and second, to measure the extent to which these costs changed as a result of the 60-minute rule. Pre-employment costs were defined in the survey as expenses related to the H-2A application process, worker recruitment, round-trip travel between Florida and the workers' home towns, and provision of housing facilities. Our initial hypothesis was that costs associated with the application process would increase with additional petitions. The costs associated with worker recruitment and in-bound/out-bound travel, however, would not be affected by the 60-minute rule unless a FLC chose to eliminate contracts outside of the 60-minute radius and thereby reduce the number of requested H-2A workers.

Early in the survey design, we decided that questions regarding housing costs should relate only to the cost of acquiring 'bed-spaces,' and not the costs associated with managing the housing facilities during the harvest season. Our reasoning was based on comments from FLCs who argued that housing costs would increase because the 60-minute rule would force current housing to be underutilized and relatively more expensive properties to be acquired at new locations. Furthermore, management and operational costs associated with

H-2A workers during a contract period are likely to differ across different agricultural industries. Our goal was to define a set of costs that are likely to be similar among all agricultural specialty crops. Average pre-employment costs per H-2A worker are estimated in 2012-13, the season prior to the 60-minute rule, and compared against similar costs during the 2013-14, the season when the new rule was implemented. Total boxes of oranges harvested by the survey participants are reported for each season to estimate the overall per box impact of H-2A pre-employment costs on harvesting costs.

This article is organized as follows. First, we review the labor requirements for hand-harvested crops, with a focus on citrus production. We then provide a brief history of the H-2A visa program and the mechanics of implementing the H-2A program. Next, we explain our survey methodology and interpret the collected data. Lastly, we summarize the research and suggest additional avenues for investigation.

2. Need for farm labor

The U.S. agricultural labor market underwent a significant transformation during the 20th century. In 1920, 30% of the U.S. population lived on farms. By 1990, less than 2% of U.S. citizens were involved directly in agriculture production (Dimitri *et al.*, 2005). Rapid mechanization was largely responsible for this trend. Today, most agronomic crops in the U.S. are mechanized completely from planting through harvest. Horticultural crops have seen significant advances in mechanization as well, particularly crops which move fruit into processing channels such as paste tomatoes and tart cherries (Huffman, 2005). Machine harvest, however, can cause significant cosmetic and physical damage to fruits and vegetables thereby rendering them unsuitable for fresh market venues.

Oranges and other citrus crops are important agricultural commodities grown in Florida with total sales exceeding \$ 1.8 billion annually (Florida Department of Agriculture and Consumer Services, 2013). Approximately 95% of Florida's sweet orange crop is processed into juice (National Agricultural Statistics Service, 2016), which in turn, supplies more than 80% of the U.S. domestic orange juice market (Wexler, 2014). Mechanical harvesting systems gained some momentum in the late 1990s when growers became concerned over whether a sufficient number of domestic workers would be available to harvest an expanding volume of sweet orange production. The number of acres mechanically harvested increased from 5,500 in 1999 to more than 36,000 acres in 2006. The discovery of citrus greening, also known as Huanglongbing (HLB), in 2005 and its subsequent spread across Florida curtailed mechanical harvesting efforts. By 2014 all mechanical harvesting efforts were suspended as growers sought to minimize any stress on HLB infected trees (Florida Department of Citrus, 2015).

HLB has taken a significant toll on Florida citrus production. Growers harvested 242 million (90-pound) boxes of oranges during the season just prior to HLB's discovery (2003-04). Eleven years later, the 2014-15 season produced less than 97 million boxes (National Agricultural Statistics Service, 2016). The decline in production resulted from both a 28% decrease in the number of bearing trees and lower per tree yields (Singerman and Useche, 2016).

The Florida industry made a serious attempt to register an abscission compound known as CMNP, which if successful, could have facilitated further development of citrus mechanical harvesting in Florida. In theory, abscission would have dramatically lowered the overall force necessary remove fruit and in so doing lessen the harvesting stress to the tree. Unfortunately, the EPA abscission registration effort was not successful and abscission's impact on tree stress could not be fully tested. As long as HLB remains a production threat and until more gentle mechanized harvesting equipment is developed, the only harvesting option for citrus growers will be hand-labor from seasonal agricultural workers.

3. A foreign-born workforce on U.S. farms

Across countries, as industrialization occurs and agricultural workers move into the manufacturing and service sectors in pursuit of higher wages, a country's domestic agricultural labor supply decreases in elasticity (Taylor, 2010). Other factors drawing farm workers away are the perceived benefits of living in an urban setting such as better access to healthcare, educational opportunities, and more varied cultural amenities. Some growers have responded to this attrition of domestic workers by increasing wages, mechanizing, and growing different, more mechanically friendly crops. For other growers, and in particular Florida citrus growers, the least costly option has proved to be importing foreign workers.

Hiring foreign guest workers to work seasonal agricultural jobs was not commonplace until the First World War when the U.S. government established a series of bilateral agreements with Mexico to encourage the seasonal migration of Mexican workers to U.S. farms (Martin, 2003). Martin (2003) refers to these agreements from 1917 to 1921 as the 'first bracero program.' The U.S. federal government implemented a second bracero program during the Second World War to address domestic farm labor shortages. Before the program was discontinued in 1964, 7.5 million contracts were signed.

Recent surveys by the United States Department of Agriculture (USDA) indicate that there are slightly more than one million agricultural workers in the US, including full-time, part-time, and agricultural service workers (Economic Research Service, 2014). Many of these workers do not have legal status for employment in the U.S. More than 50% of the farm workers interviewed for the National Agricultural Worker Survey self-report that they are working in the U.S. without legal documentation (Employment and Training Administration, 2014). Data from the Social Security Administration suggest that a truer percentage of undocumented agricultural workers may be closer to 70% (Gunderson *et al.*, 2009). In a 2014 Florida strawberry industry survey, half of the growers believe that illegal workers account for 90% of their seasonal workforce (Guan *et al.*, 2015).

The H-2A visa program provides U.S. agricultural employers with a legal avenue to hire foreign agricultural workers. The H-2 temporary work visa program has been in place since the Immigration and Nationality Act was passed in 1943. The program was separated into the H-2A and H-2B programs in 1986 with the passage of the Immigration Reform and Control Act. The latter visa category allows employers in the service and manufacturing sectors to recruit foreign workers, while the former is specifically for agricultural workers.

The number of Florida H-2A positions certified by the DOL has been steadily growing since 2009 both in the actual number and as a percentage of total U.S. H-2A workers (Table 1). During fiscal year (FY) 2010, Florida agricultural employers hired 4,432 H-2A workers, or 5.6% of the total H-2A workers certified across the U.S. In FY 2015, Florida H-2A numbers had grown to nearly 18,000 and accounted for 12.8% of the total U.S. H-2A certified positions. The statistics on the number of Florida H-2A workers hired specifically to harvest citrus during FY 2013 and 2014 were not recorded, or at least summarized. In the two years prior to our survey, however, the percentage of citrus H-2A workers in Florida had increased from 71 to 84% of all the H-2A workers in Florida (Office of Foreign Labor Certification, 2014).

4. Mechanics of the H-2A visa program

The H-2A application and recruitment process involves three federal, one state, and at least one local government agency. The federal agencies are Department of Labor, Homeland Security, and State Department. At the state level, there are the state workforce agency¹ and the local department of health where worker housing is located.

Between 60 and 75 days before the start of the season, a grower or FLC completes an application for foreign guest workers (Employment and Training Administration, 2016). The application packet is submitted initially

¹ The Department of Economic Opportunity is Florida's state work force agency.

Table 1. Number of H-2A applications and certified positions by the U.S. Department of Labor across the United States (US) and in Florida (FL) between Fiscal Year (FY) 2010 and 2015.¹

	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Florida crop year-citrus	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15
Certified H-2A applications						
US	6,988	7,000	7,845	8,118	9,405	N/A
FL	51	54	78	108	N/A	N/A
Certified H-2A positions						
US	79,011	77,246	85,248	98,821	116,689	139,832
FL	4,432	5,741	6,945	10,051	13,544	17,942
FL citrus (%)	N/A	71	84	N/A	N/A	N/A
FL AEWR ² (\$/hr)	9.20	9.50	9.54	9.97	10.26	10.70

¹ Data of FY2010 to FY2013 adapted from OFLC (2013); FY2014 from OFLC (2014); and FY2015 from OFLC (2015). N/A = data not available.

² AEWR = adverse effect wage rate.

to the state workforce agency and includes the ‘job-order.’ The job-order (form ETA-790) specifies the number of foreign workers being requested as well as the start and end dates of the contract period. The job-order is designed to be the written contract between employer and worker, outlining all the job responsibilities of the worker and benefits to be paid by the employer. The job order is both crop and activity specific. The job order sets forth the duration of the contract period, the minimum weekly number of ‘offered’ hours, and the minimum hourly rate of pay. Typically, the federal-mandated Adverse Effect Wage Rate (AEWR)² is the minimum hourly rate, unless a higher collective bargaining rate or local prevailing wage rate is already in place. The AEWR, which varies across states, is set to ensure that H-2A workers do not push down the wages of domestic workers performing similar jobs. The job-order guarantees that each worker will earn at least 75% of the minimum earnings set forth during the contract period (Office of Foreign Labor Certification, 2012). A foreign H-2A worker can be sent home prior to earning the 75% guarantee if he is replaced by a domestic worker. Otherwise, only an ‘act-of-God’ that prematurely destroys a crop will exempt an H-2A employer from the three-quarter guarantee.³ Finally, the job order lists all benefits accorded to the foreign guest worker such as free housing, free in-bound transportation, and if the worker completes the contract, free transportation back to the worker’s home town. Housing facilities must be inspected and certified that they meet local health and safety standards. If the housing units do not have kitchen facilities, the employer must cater three meals a day to all H-2A workers.

Submission of the H-2A application package with the state workforce agency initiates a recruitment process for ‘domestic’ workers. Assuming that the number of job referrals from the state work force agency is not sufficient to cover the employer’s labor needs, the application is forwarded onto the DOL with form ETA-9142A, an Application for Temporary Employment Certification. The employer-applicant continues to recruit for domestic workers by placing ads in media outlets in the ‘area of intended employment’ as well as in additional markets as directed by DOL (Office of Foreign Labor Certification, 2012). Active recruitment of domestic workers continues through the half-way point of the H-2A contract period. If domestic workers are hired prior to the contract’s start date, DOL reduces the requested number of foreign guest workers one-for-one. If domestic workers are hired after the contract’s start date, employers have the option of retaining foreign guest workers or sending them home. Employers are prohibited from hiring H-2A workers if they have laid off U.S. workers within 60 days of the date of need, unless the released U.S. workers were offered and rejected the agricultural job opportunities for which the H-2A workers were sought (Eisenbrey, 2009).

² As of January 1, 2016 the AEWR in Florida was \$ 10.70 per hour.

³ The DOL must approve that a given event is an ‘act-of-God’.

Once the labor certification process (forms ETA 790 and 9142A) are completed, a petition for non-immigrant worker visas (form I-129) is submitted to the Department of Homeland Security's Citizenship and Immigration Services (CIS). At this point, guest workers are recruited and CIS conducts background checks. With the list of recruited workers vetted, the Department of State issues individual H-2A visas.

Employers are responsible for all expenses associated with the H-2A application and the recruitment process including filing and visa fees, any fees charged by third-party recruiters, bond expenses, and advertising costs to recruit domestic workers. The costs associated with the petition application, travel, and housing are identified as pre-employment costs. These costs, incurred as a result of the H-2A process, are not crop specific. Therefore, results of this study can be generalized to other agricultural employers seeking H-2A workers.

5. Survey methodology

The objectives of this study were to quantify the pre-employment costs associated with the H-2A program and determine the extent to which these costs were affected by the DOL's 60-minute rule imposed before the start of the 2013 citrus harvest season. Cost data were collected from FLCs who harvested citrus and employed H-2A workers during the 2012-13 and 2013-14 seasons. The Florida Department of Economic Opportunity provided the names and addresses of 75 FLCs which comprised a complete list of contractors who were both citrus harvesters and H-2A petitioners in 2013. Surveys were sent to everyone on the list. The surveys asked questions regarding the FLC's individual petitions including the requested number of workers, contract period, and the number of citrus boxes they were contracted to harvest. In addition, the FLCs were asked to provide cost data on (1) the petition application process; (2) in- and outbound travel costs for H-2A workers; and (3) rental or annual ownership costs pertaining to the housing facilities. Petition application costs included agency filing fees, advertising, bond, and visa costs, as well as any fees paid to consultants to help with petition filing or worker recruitment. Cost data were requested for 2012-13 and 2013-14, the season prior to and after the 60-minute rule was instituted.

All costs are reported on a per worker basis. Worker costs are aggregated across categories and multiplied by the total number of H-2A workers to determine total pre-employment costs for each petition and employer. Likewise, the H-2A pre-employment cost per box of citrus is determined by dividing the total H-2A pre-employment cost by the total number of boxes harvested by the total number of H-2A workers represented in the survey.

6. Survey results

Fourteen of the 75 surveys were returned of which nine surveys (12% response rate) were complete with all requested cost information for both harvest seasons. While we would have liked a higher response rate, the employers who completed the survey hired a considerable number of H-2A workers. Collectively, these nine employers hired 2,518 H-2A workers to harvest more than 26 million boxes of citrus in the 2012-13 season, and 2,610 H-2A workers to harvest more than 21 million boxes during the 2013-14 season. For each season, the surveyed H-2A harvesting companies accounted for more than 17% of the total Florida citrus harvest. The employers who completed the survey hired 25% of the total number of H-2A workers in Florida during the 2012-2013 season, and 19% of the total number of H-2A workers in Florida during the 2013-14 season (Table 2).

Eight of the nine employers had to establish additional housing facilities for their 2013-14 petitions to be in compliance with the 60-minute rule. Consequently, the number of individual petitions increased from 13 in 2012-13 to 22 in 2013-14 (Table 2). Between the 2012-13 and 2013-14 seasons, the overall average number of H-2A workers per employer increased by 10, from 280 to 290. The average number of H-2A worker per petition, however, declined from 194 to 119 between the 2012-13 and 2013-14 seasons. According to a two-tailed two-sample *t*-test with heteroscedasticity, there is a statistically significant difference in the number of

Table 2. Summary of surveyed citrus harvesters who hired H-2A workers during the 2012-13 and 2013-14 harvest seasons (adapted from National Agricultural Statistics Service, 2016).

	2012-13	2013-14
Employers (citrus harvesters)	9	9
Individual petitions	13	22
Duration of job order (months)	7 (Nov-May)	8 (Nov-June)
H-2A workers hired, total	2,518	2,610
Percentage of Florida H-2A workers ¹	25.1	19.3
H-2A workers hired, per petition	194	119
H-2A workers hired, per employer	280	290
Citrus boxes harvested by surveyed harvesters	26,914,877	21,781,993
Total citrus boxes harvested across state	156,230,000	124,030,000
Percentage of citrus harvest by sampled employers	17.2	17.6

¹ See Table 1 for Florida H-2A totals.

workers per petition between years.⁴ The duration for most job-orders was between seven and eight months corresponding to the November through June Florida citrus harvesting season (Table 2).

Table 3 summarizes the average pre-employment costs associated with petition filing, recruitment, travel, and housing of H-2A workers for each worker. Petition and recruitment costs include government agency fees, advertising, bonds, consultants, and worker visas. The DOL and CIS charge flat fees to process H-2A petitions. The DOL charges \$ 100 per application plus \$ 10 per worker up to a \$ 1000 maximum application fee. The CIS charges \$ 325 to process one petition for non-immigrant worker visas (form I-129). This cost structure, along with the time and effort required to file a petition, encourages employers to group as many workers onto a single petition as possible. One employer filed a petition for just 20 workers. Thus, the employer's filing costs were \$ 31.25 per worker. Another FLC petitioned for 390 workers and his filing fees were only \$ 3.40 per worker. There is a statistically significant difference in the average DOL-CIS registration fees per worker between years for the sampled petitions (Table 3). The 2013-2014 season had fewer workers per petition and thus higher fees per worker. The sampled employers paid an average of \$ 6.42 per worker in registration fees in the 2012-2013 season, and \$ 8.97 in the 2013-2014 season.

H-2A employers are required to actively recruit domestic workers by advertising job notices in the media markets defined as the 'area of intended employment.' The most common method of advertising is through newspapers. Advertising costs vary widely depending on whether the newspaper services an urban or a rural region, and whether the particular newspaper publishes a Sunday edition. Advertising is a lump-sum payment per petition. In general, as the number of workers increase per petition, one would expect the advertising cost per worker to decrease. However, despite observing more petitions with fewer workers per petition in the 2013-2014 season, the average advertising costs per worker decreased. Advertising costs averaged \$ 10.76 per worker in the 2012-2013 season and decreased to \$ 9.64 per worker in the 2013-2014 season. There is not a statistically significant difference in the average advertising cost per worker between years for the sampled petitions (Table 3). Some employers faced increases in advertising costs while others saw dramatic decreases. For example, an employer paid \$ 5,867 for advertising two petitions in the 2012-2013 season, but only \$ 1,711 for two similar petitions in the following season.

There are several potential explanations for reduction in average advertising costs. One hypothesis is that new petitions resulting from the 60-minute rule tended to be located in more rural locations with relatively cheaper advertising costs. A second reason could be that employers are learning how to more cost-efficiently

⁴ The test reported a *P*-value of 0.0578 rejecting the null hypothesis with $\alpha=0.10$ that the average number of H-2A workers per petition in the 2012-13 season was equal to the 2013-14 season. The reported H-2A workers per petition in the 2012-13 and 2013-14 seasons had corresponding standard deviations of 110.8 and 102.0, respectively. Satterthwaite's degrees of freedom for the test were 23.64.

Table 3. H-2A pre-employment costs itemized with average and ranges summarized from surveys of H-2A employers during the 2012-13 and 2013-14 citrus harvesting seasons.¹

	2012-13		2013-14		% change ²
	Average (\$)	Range low-high	Average (\$)	Range low-high	
Cost per hired H-2A worker					
DOL/CIS fees ⁵	6.42	4-19	8.97	3-31	+40*
Advertising	10.76	5-50	9.64	2-78	-10
Bond	9.49	3-14	12.06	3-38	+27*
Consultant – agent filing	25.00	10-26	25.00	15-29	–
Consultant – worker recruitment	94.66	26-110	95.79	25-120	+1
Visa	190.00	flat fee	190.00	flat fee	–
Travel	407.57	186-662	463.48	273-750	+14
Subtotal (no housing)	773.90		804.94		+4
Housing	1,322.82 ³	684-1,566 ⁴	1,165.36 ³	415-1,461 ³	-12
Average (\$/H-2A)	2,066.72	1,494-2,317	1,970.30	1,371-2,355	-5

¹ * Indicates a statistically significant difference (with $\alpha=0.05$) between years.

² A two-tailed two-sample *t*-test with heteroscedasticity tests for equal means between years.

³ Average cost for an 8-month contract (the median reported contract length).

⁴ Range includes contracts varying from 2.5 to 10 months long.

⁵ DOL = U.S. Department of Labor; CIS = Department of Homeland Security's Citizenship and Immigration Services.

manage their advertising costs as they gain more experience with the program. Third, the fall in average advertising costs could be attributable to normal variation or even misreporting. Overall, the survey responses reflect wide differences in advertising costs among employers, likely driven by the variance in advertising costs due to both geography and ad placement timing.

FLCs are required to purchase a bond with each H-2A application. The bond, which grower-employers do not have to purchase, ensures that all financial obligations owed to the H-2A workers are fully met by the FLC. While the amount of the bond for a given petition increases by the number of workers being requested, the overall cost of an individual bond depends greatly on the asset level and prior employment history of the FLC petitioner. The average cost per H-2A worker to acquire a bond in the 2012-2013 season was \$ 9.49 and increased to \$ 12.06 per worker in the 2013-2014 season. There is a statistically significant difference in the reported bond costs per worker between years for the sampled petitions (Table 3). These results suggest that, on average, bond costs increase with the number of petitions.

The increase in bond costs is logical given the legal requirements and hiring practices observed in the sample. FLCs must obtain a surety bond of \$ 5,000 for petitions with fewer than 25 employees, \$ 10,000 for 25 to 49 employees, \$ 20,000 for 50 to 74 employees, \$ 50,000 for 75 to 99 employees, and \$ 75,000 for 100 or more employees. Given that many of the observed petitions requested over 200 workers in the 2012-13 season, splitting these petitions up resulted in a significant increase in bonding requirements. For example, a single 200-worker petition would only require a \$ 75,000 surety bond, whereas a 150-worker petition accompanied by a 50 worker petition would require the same \$ 75,000 bond plus another \$ 20,000 bond. Conversely, it is possible that splitting petitions up could result in reduced bond costs due to the nonlinear bond requirement structure. For example, an 80-worker petition would require a single \$ 50,000 bond, but two 40-worker petitions would require two \$ 10,000 bonds.

H-2A consultants are an important resource for many employers. Generally, consultants perform two types of services: (1) prepare and file the petition(s); and (2) handle in-country worker recruitment. Among the nine sampled employers, six paid consultants to provide one or both of those services. Other employers chose to

perform these tasks in-house and did not report a separate cost for petition filing and in-country recruitment. From those employers who paid consultants to prepare and file the H-2A petition, a typical cost was \$ 25 per worker. The cost for in-country recruitment averaged \$ 94.66 and \$ 95.79 per worker for 2012-2013 and 2013-2014 seasons, respectively. There is not a statistically significant difference in the average consulting costs per worker between years for the sampled petitions (Table 3). These average costs are added to the costs reported by those employers who handled petition filing and in-country recruitment in-house in order to obtain a consistent estimate of the average total cost across the entire survey. The cost of an H-2A visa is set by the U.S. Department of State and was a flat fee of \$ 190 per person for both 2012 and 2013.

Travel costs consist of round-trip expenses for bringing H-2A workers from their respective home towns to the employer's housing facility in Florida. Since all the guest workers came from Mexico, travel expenses include bus fare, hotels if necessary, and a per diem food allowance. Travel costs per worker represent nearly 20% of total pre-employment costs in the 2012-2013 season and increase to more than 23% of total pre-employment costs in the 2013-2014 season. Despite an increase in average travel costs, there is not a statistically significant difference between seasons (Table 3). In each year the reported range of travel costs varied significantly reflecting the longer distances some groups of workers had to travel and the need for hotel rooms during extended trips.

H-2A employers can either own or lease housing units. In either case, employers provided data that reflected the cost of securing the necessary number of housing units as required per each H-2A petition. The average cost of housing is reported for an 8-month contract, the median reported H-2A contract length. In the 2012-2013 and 2013-14 seasons, the cost to rent housing accounted for 64 and 59% of total pre-employment costs, respectively. In the 2013-2014 season, the average monthly cost of housing an H-2A worker decreased 12% per worker from the previous year (Table 3). While there is not a statistically significant difference in the average housing cost per worker between years for the sampled petitions, the decrease in cost was not expected. Instead of building or purchasing new housing units, FLCs complied with the 60-minute rule by leasing the additional housing facilities. The fall in average housing costs is primarily driven by one observation where an employer switched from owned to leased housing and reported considerable savings as a result. Further, there was considerable variance in the reported housing costs. This variance may reflect that some employers do not accurately compute the full cost of providing housing, or that some employers provide housing at a much lower cost than other employers. As with travel and advertising costs, housing costs may differ significantly between employers depending on location, timing, and amenities.

As stated previously, the cost of managing housing during the season was not included in our survey. While we felt justified in our reasons to exclude these costs, this does mean our analysis excludes the additional administrative costs from managing multiple housing sites such as the costs of employing separate management and maintenance personnel for each location.

In total, the reported cost associated with recruiting, transporting, and housing one H-2A worker from Mexico for eight months in the 2012-2013 season averaged \$ 2,067. The cost in the 2013-2014 season decreased by 5% to \$ 1,970 per worker.⁵ Total reported costs were not significantly different between seasons (Table 3). Housing costs alone make up 60% of the total pre-employment costs. When housing costs are excluded, the remaining items increase costs by \$ 31 per worker from 2012-13 to 2013-14. This increase, however, was not statistically significant. The only items that increased between years and were statistically significant were petition fees and bond costs. The combined increase in these items, however, amounted to only about \$ 5 per worker. The H-2A visa cost only accounted for nearly 10% of the total pre-employment costs and did not change between years. Between 7 and 9% of these costs were spread among consultants and advertising, which also did not significantly change between years.

⁵ This decrease in total pre-employment cost per worker is primarily attributable to the reported decrease in housing costs between years; once again, this decrease in housing costs is driven by a single sampled employer converting from owned to leased housing and reporting reduced housing costs as a result.

Table 4 presents the average per box cost of the pre-employment H-2A process. This estimate is derived by dividing the aggregate sum of pre-employment costs by the total boxes harvested by the H-2A workers from the nine surveyed companies. The cost of the pre-employment H-2A program was 19-cents per (90-pound) box (Table 4). This estimate represents 9% of the total cost to harvest citrus in Florida during the 2012-13 season (Muraro, 2012). H-2A pre-employment costs increased to nearly 24-cents per box in the 2013-14 season despite a slightly lower per worker pre-employment cost (Table 3). The significant factor driving the increase in H-2A pre-employment unit costs was the decline in boxes harvested by H-2A workers during the 2013-14 season. Mainly due to the negative effects from citrus greening, 92 more H-2A workers (Table 2) harvested 5 million fewer boxes during 2013-14 than what was harvested in 2012-13.

7. Conclusions

Despite rapid mechanization in the U.S. agricultural sector, labor-intensive farm positions continue to be an integral part of the fruit and vegetable economy (Calvin and Martin, 2010). Agricultural producers and consumers rely on seasonal and migrant workers to grow and harvest fresh produce each year in high-value industries where mechanized harvesting is not yet a feasible alternative. Florida's citrus industry is especially reliant on manual labor and the prospect of mechanical harvesting has been put on hold as a result of the citrus greening disease (Roka, 2013). The number of legal domestic workers willing to do agricultural work continues to shrink, leading more employers to consider the H-2A visa program as a source of qualified labor (Taylor and Charlton, 2012).

Currently, more than half of Florida's citrus crop is harvested by H-2A workers and most are hired using FLCs as intermediaries (M. Carlton, personal communication 2015). H-2A employers, however, are required to pay all petition and visa processing fees, and provide free housing and transportation both to and from a workers home town as well as free transportation during the season between the housing location and the various worksites. Further, H-2A employers must pay a higher minimum wage known as the AEWR. Across the country the AEWR varies between \$ 10.59 and \$ 13.80 (National Agricultural Statistics Service, 2015). In Florida the AEWR was \$ 10.70 as of January 1, 2016. U.S. agricultural employers who hire H-2A workers are required to offer the same benefits to any domestic worker applying for the same job.

The first objective of this paper was to quantify a list of pre-employment expenses incurred by employers of H-2A workers, which is frequently referenced but has not yet been precisely determined. This analysis estimates these costs per worker and per box using survey data from a number of H-2A employers who collectively manage between 20 and 25% of Florida's H-2A workers, who in turn harvest approximately 17.5% of the Florida citrus harvest. Overall, we found a FLC who recruits and hires foreign agricultural guest workers through the H-2A program must spend close to \$ 2,000 per worker before the first piece of fruit is picked. These costs cover H-2A petition filing, agency fees, worker recruitment, round-trip travel expenses from the workers' respective home towns, and to acquire suitable housing space during the contract period. Given how we defined pre-employment costs, we argue that these costs would be similar for H-2A employers outside of citrus.

Table 4. Cost per box of H-2A pre-employment costs.

	2012-13	2013-14
H-2A workers hired (Table 2)	2,518	2,610
Pre-employment costs (Table 3)	\$ 2,067	\$ 1,970
Total pre-employment costs	\$ 5,204,706	\$ 5,141,700
Total citrus boxes harvested (Table 2)	26,914,877	21,781.993
Average	\$ 0.19 per box	\$ 0.24 per box

A second objective of this paper was to analyze how H-2A pre-employment costs changed between the 2012-13 and 2013-14 seasons as a result from implementing the DOL mandated 60-minute rule. Toward that goal we found mixed results. We found there to be a statistically significant decrease in the number of H-2A workers per petition between the 2012-2013 and 2013-2014 seasons. Similarly, we observed a statistically significant increase in the reported DOL-CIS fees and bond costs per worker. We did not, however, observe a statistically significant increase in advertising, consulting, travel, housing, and total costs between seasons (Table 3). While the 60-minute rule increased some costs associated with hiring H-2A workers, the increase in these categories were a relatively small component of total pre-employment costs. Travel and housing costs, on the other hand, accounted for more than 80% of the total pre-employment cost, and these costs did not significantly change between seasons. The decrease in housing costs between years appears to contradict the conventional wisdom that the 60-minute rule would increase housing costs by requiring employers to arrange additional housing facilities, though it is difficult to confidently interpret this result given the large variance in reported housing costs between years and employers. Further, the sampled employers did not construct new housing to adhere to the rule, but rather leased the additional housing.

The robustness of the 60-minute rule analysis was compromised by the design of the survey in which we chose not to include in-season managerial costs with respect to housing and transportation. While this decision was driven to collect cost data which would be applicable to operations other than citrus, by not including in-season housing management and transportation costs we could not fully explore the effect the 60-minute rule had on H-2A costs. It is not clear a priori how the inclusion of these costs would affect the net change in total H-2A pre-employment costs. On one hand, managing multiple housing locations could force higher costs with respect to employing more individuals in the management of each location. On the other hand, disbursing a given number of H-2A workers across the landscape may shorten daily trips to harvesting sites, thereby reducing fuel costs and worker time spent simply in transit.

Limitations aside, we were able to capture cost information about a number of fixed costs associated with an H-2A petition. The H-2A program is becoming an increasingly important source of labor for U.S. specialty crop farms and in particular for the Florida citrus industry. By providing cost information about the H-2A program, we seek to mitigate some of the risk of participation for agricultural employers who are unfamiliar with the H-2A program. Furthermore, as Florida citrus growers seek to minimize production costs amidst the spread of citrus greening, information about harvesting costs and the increasing use of foreign guest workers could assist them in planning for future production as well as investing in future technologies such as mechanical harvesting.

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