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Examining the Growth in Seasonal Agricultural H-2A Labor

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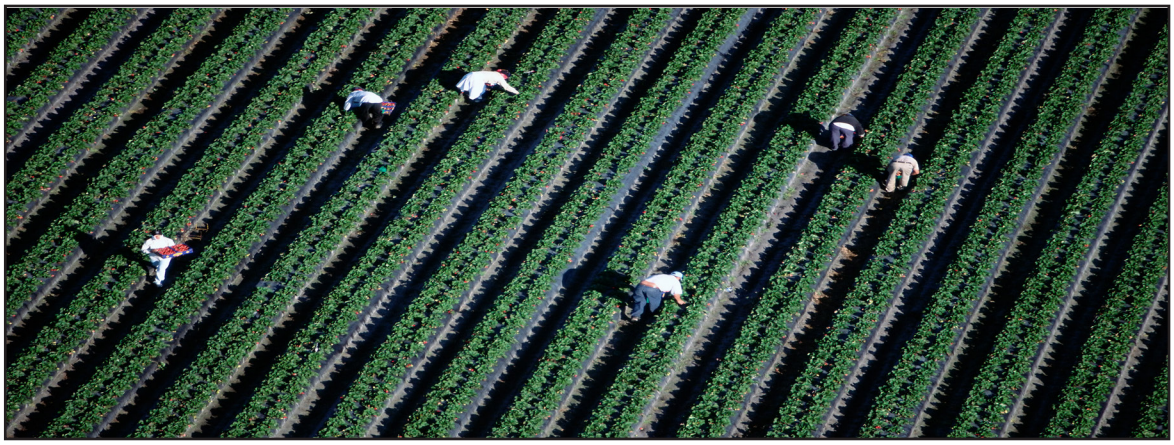

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Abstract

The H-2A Agricultural Guest Worker program allows U.S. agricultural employers to hire foreign workers on a temporary or seasonal basis. Many U.S. producers of labor-intensive commodities appear to be adjusting to tighter farm labor markets by employing H-2A workers. The program rapidly expanded over the last decade, increasing from 79,000 H-2A workers in 2010 to 258,000 in 2019. All sectors and most regions of the United States have experienced significant growth in H-2A employment, but the increase is most pronounced in sectors with high labor requirements and seasonal employment, i.e., fruit and tree nuts and vegetables and melons. H-2A growth is uneven across the United States with larger employment changes in the Southeast than in other regions. Farm labor contractors (brokers that directly employ farmworkers and lease their services to farms) account for a growing share of H-2A employment. This report explores how H-2A usage levels differ by agricultural sector, across geography, and the type of firm requesting the workers. The analyses in this study can provide a benchmark to measure future changes in H-2A labor use.

Keywords: Farm labor, H-2A program, immigration, agriculture, guest worker, foreign worker, seasonal labor, labor market, legal status, farm labor contractor, fruit, tree nuts, vegetables, melons, labor supply, Mexico, growers association, USDA, ERS, Economic Research Service, U.S. Department of Agriculture

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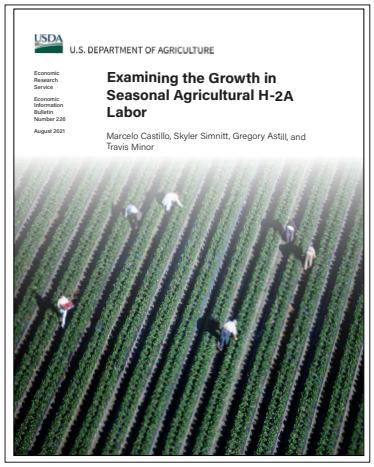
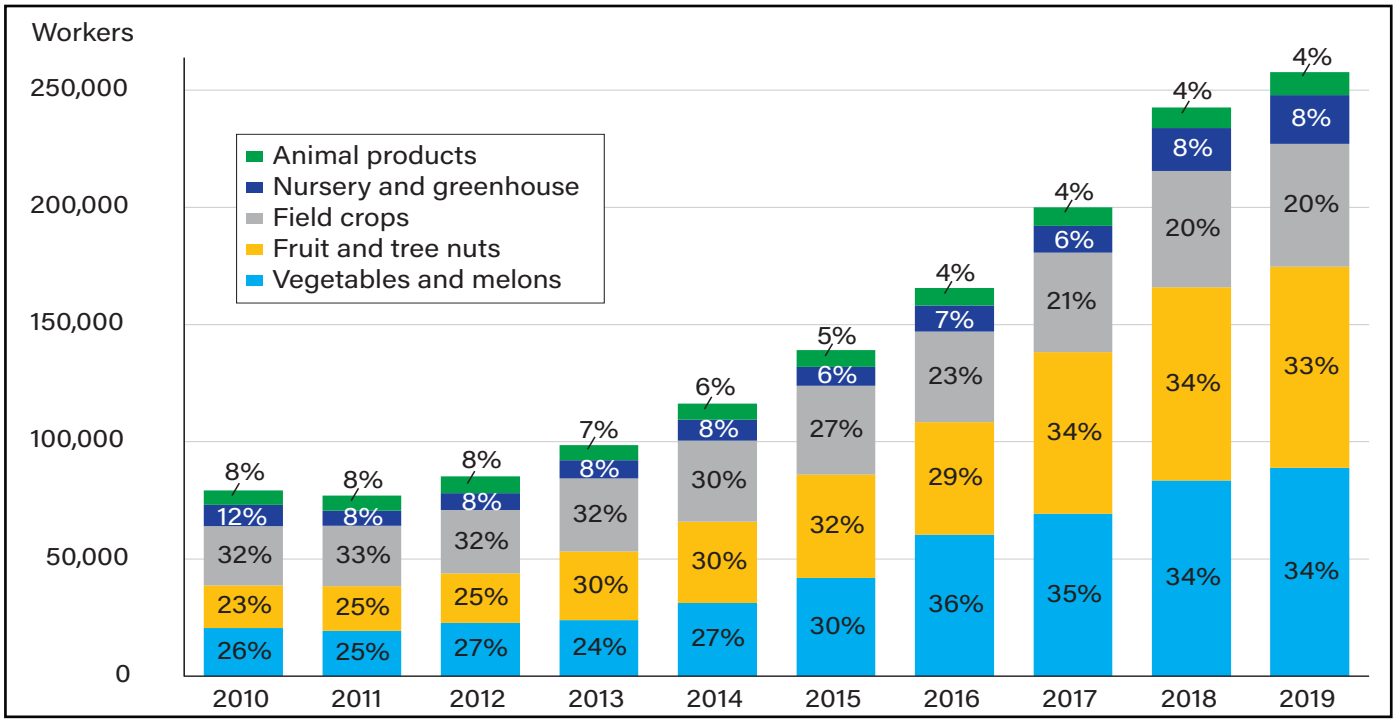
What Is the Issue?



Labor availability is an increasingly important issue for agricultural producers considering the evidence of recent tightening of U.S. farm labor markets. A decline in labor availability is especially challenging for producers of labor-intensive crops such as fruits and vegetables requiring harvesting by hand; seed corn requiring detasseling; tobacco requiring curing; crawfish requiring shelling; or nurseries requiring pruning and repotting. The H-2A Agricultural Guest Worker Program allows producers to hire non-immigrant foreign labor for short-term contracts. U.S. agricultural producers increasingly use the program to hire workers, though information is scarce regarding trends in sectoral use, geographic composition, and the types of employers that use the program. This report examines how H-2A use varies across agricultural sectors, geography, and the types of firm requesting H-2As.

H-2A certified workers by sector, 2010-19



Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from U.S. Department of Labor, Office of Foreign Labor Certification.

What Did the Study Find?

- The number of certified H-2A positions increased from 79,000 in 2010 to 258,000 in 2019 (see chart above). H-2A employment increased in most regions and sectors.
- H-2A employment growth was particularly strong in fruit and tree nuts and vegetables and melons. The combined share of H-2A positions certified in these sectors increased from 49 to 67 percent.
- H-2A employment by farm labor contractors (FLCs) expanded dramatically from 2010 to 2019. The FLC share of H-2A employment increased from 15 to 42 percent. FLC shares increased in all sectors though increases were more pronounced in fruit and tree nuts, and vegetables and melons.
- H-2A workers helped produce a wide array of labor-intensive commodities. The following commodities had the highest use of H-2A in 2019:
    - Vegetables and melons (34 percent of total H-2A certifications): melons, tomatoes, lettuce, sweet potatoes, cucumbers, onions, and peppers.
    - Fruit and tree nuts (33 percent): apples, blueberries, strawberries, citrus, cherries, and peaches.
    - Field crops (20 percent): tobacco, seed corn, and sugarcane.
    - Nursery and greenhouse (8 percent): nursery and greenhouse, Christmas trees, pine straw, and hemp.
    - Animal products (4 percent): open range livestock (including sheep, goats, and cattle), bees, crawfish, and horses.
- Most employers offered to pay H-2A workers hourly wages no greater than the region-specific adverse effect wage rate (AEWR), which is a minimum wage for H-2A workers set by the Department of Labor. Inflation-adjusted H-2A wages (in 2019 dollars) increased for all sectors from 2010 to 2019, on average by 26 percent.
- From 2010 to 2019, the average duration of an H-2A labor contract decreased from 6.7 to 5.3 months, a 20 percent decline. The nursery and greenhouse, and animal products sectors showed the most pronounced decreases.
- In 2019, H-2A employment was highest in States heavy in fruit, vegetable, and melon production such as Florida, Washington, Georgia, California, and Michigan; tobacco growing States such as North Carolina and Kentucky; and crawfish and sugarcane producing States such as Louisiana. While most of the growth from 2010 to 2019 came from these large employers, H-2A employment increased in nearly every State.
- Growers in different States use the H-2A program with widely different intensities (as measured by the ratio of H-2A full-year jobs to total labor expenditures). Intensity is high in the Southeast and low in California and Texas.

How Was the Study Conducted?

To generate the H-2A summaries by sector, we use publicly available H-2A case disclosure data. The U.S. Department of Labor provides online access to records of all H-2A applications by fiscal year, dating to FY 2006. For 2010-19, the data contain the applicant name and contact information, the number of positions to be certified, contract length, job title, and primary crop. Unfortunately, the quality and scope of these data are not always consistent over time. Primary crop names, which we use to assign sectors to applications, are missing for FYs 2010, 2013, and 2014. Moreover, information identifying which type of employer filed the application (individual firms, FLCs, and growers associations) is not available before 2013. To deal with these challenges we employ several methods described in the Appendix.

Examining the Growth in Seasonal Agricultural H-2A Labor

Introduction

Immigrant workers have played an important role in U.S. agriculture for many decades. In 2016, most of those working on U.S. farms were hired farmworkers (Bureau of Labor Statistics, 2016; Martin, 2017).[1] For crop agriculture, approximately 75 percent of hired farmworkers were immigrants, primarily from Mexico, an estimated 60 percent of whom were not authorized to work legally in the United States (Hernandez and Gabbard, 2018).[2]

The supply of workers from Mexico willing to work in U.S. agriculture appears to be declining, however (Charlton and Taylor, 2016). Indicative of this decline are anecdotal and empirical evidence that U.S. farmers face labor shortages, rising farm wages, and increased use of the H-2A Agricultural Guest Worker Program (Richards, 2018; Hertz and Zahniser, 2013; Zahniser et al., 2018; Rutledge and Taylor, 2019; Luckstead and Devadoss, 2019).[3] Additionally, the unauthorized Mexican population in the United States is declining. According to recent estimates, approximately two million fewer people from Mexico lived in the United States without legal authorization in 2017 than in 2007, a decrease of 28 percent (Passel and Cohn, 2019). Several possible explanations for this decrease include falling fertility rates and increasing educational levels in rural Mexico, better employment prospects in the Mexican nonagricultural sector, compression of income differentials between the U.S. and Mexico following the Great Recession, and stronger enforcement of U.S. immigration laws (Hanson et al., 2017; Taylor et al., 2012).[4]

Labor-intensive industries within U.S. agriculture are especially sensitive to a falling labor supply. In crop production, fruit, vegetables and melons, and nursery and greenhouse ("specialty crops") are particularly labor-intensive. Combined, they account for a large share of total U.S. employment of hired farmworkers. Findings from the 2017 Census of Agriculture (COA) suggest three industries employed about 44 percent of all farmworkers hired in the United States. Many specialty crops require substantial labor at every stage of production from planting to harvest and post-harvest. Labor requirements are particularly high during the harvest season because many delicate specialty crops must be harvested by hand to avoid bruising and to identify ripeness (Huffman, 2005). Within livestock production, the labor share of total expenses is highest in aquaculture. The dairy cattle and milk production industry, often cited as sensitive to fluctuations in the population of immigrant workers (Martins et al., 2019), has the second highest labor cost.

How can labor-dependent agricultural producers adapt to a decreasing farm labor supply? One approach is to substitute labor with capital through increased mechanization. Although mechanical harvesters and sorters

[1]Using data from the 2016 Current Population Survey, the Bureau of Labor Statistics estimated that hired farmworkers constituted about 60 percent of average farm employment in the U.S. Hired farmworkers include individuals directly hired by producers, as well as those employed through intermediaries such as labor contractors.

[2]These estimates were computed using data from the 2015-2016 National Agricultural Workers Survey (NAWS), which was the most recent data at the time this report was written. The NAWS does not sample H-2A workers.

[3]In extreme cases, growers have been forced to forego harvesting portions of their crop because of an inability to hire enough workers at a profitable wage (Taylor et al., 2012; Minor et al., 2020).

[4]The following factors likely contribute to a lower U.S. farm labor supply: A decline in the migration rates of farmworkers within the U.S. (Fan, Gabbard, Pena, and Perloff, 2015), the implementation of stricter immigration enforcement laws at the local level (Kostandini, Mykerezi, & Escalante, 2013; Ifft and Jodlowski, 2016), and an increase in labor demand in sectors that compete for workers with agriculture (e.g., construction) following the Great Recession.

are heavily used in certain sectors (e.g., row crops, tree nuts, processed fruit, and vegetables), mechanical harvesters for many specialty crops are not yet technologically or economically viable (Calvin and Martin, 2010; Gallardo and Zilberman, 2016; Gallardo and Sauer, 2018).[5] Another option is to hire temporary foreign labor through the H-2A Agricultural Guest Worker program, a nonimmigrant visa program that allows U.S. producers to hire foreign labor for short-term contracts.[6]

From 2010 to 2019, the number of H-2A workers certified increased from about 79,000 to 258,000. In this report, we document trends in H-2A use by sector, region, and employer type (individual firm, farm labor contractor, or growers association). We document increases in H-2A wages and employment in all regions and sectors, which is consistent with a national decline in the supply of farm labor. Growth in H-2A was geographically uneven across the United States with larger employment changes in the Southeast than in other regions. H-2A employment increases were highest in fruit and tree nuts, and in vegetables and melons. Increases in H-2A also occurred in other labor-intensive sectors (nursery and greenhouse) and in labor-intensive industries within field crops and animal products (tobacco, seed corn, crawfish, and open range livestock). Employment growth likely was much lower in the animal products sector than in fruit and tree nuts, and vegetables and melons because many jobs in large labor-intensive industries such as dairy cattle and milk production are year-round. Few dairy jobs qualify for H-2A employment because H-2A jobs must be temporary or seasonal.

We also document a rising share of applications filed by farm labor contractors (FLCs). FLCs are brokers that directly employ farmworkers and lease their services to farms. In addition to simplifying the recruitment and management of farmworkers, FLCs may help farmers share the risk associated with sanctions for hiring undocumented workers (Taylor and Thilmany, 1993; Thilmany, 1996).[7] FLCs may also benefit workers by mitigating the uncertainty of searching for employers, especially for undocumented workers with little knowledge of U.S. labor markets and a lack of fluency in English (Pena, 2012).[8] From 2010 to 2019, the FLC share of H-2A employment increased from 15 to 42 percent and accounted for a growing share of H-2A employment in all sectors, particularly in fruit and tree nuts, and vegetables and melons.

One explanation for the rise in the FLC share of H-2A employment is that the decline in farm labor supply is relatively strong in areas where FLCs are especially active (e.g., California and the Southeast).[9] A second explanation is that individual firms that now have problems hiring locally find it more economical to hire H-2A workers through FLCs than to hire them directly. To hire an H-2A worker an employer incurs many costs above those of hiring locally, including application and recruitment fees, travel to and from the worker's home country, and housing. For many small producers that need workers for short-term contracts, these costs are likely prohibitive. Since FLCs tend to serve multiple producers, they may incur smaller average costs per H-2A worker than individual employers.

[5]Research for mechanization in the specialty crops sector received $287.7 million in USDA funding between 2008 and 2018 (Astill et al., 2020).

[6]In addition to substituting machines for workers, and supplementing their current workforce with H-2A labor, farmers can also adjust by satisfying their current workforce (perhaps by increasing wages), and by stretching their existing workforce by increasing productivity (Martin, 2017).

[7]Farmers also face the risk of not finding enough workers at harvest time or maintaining a sufficient crew as the season progresses.

[8]In a survey of 211 farmworkers, Billikopf (1997) finds that farmworkers prefer to work directly for a grower. Workers perceive that growers pay and treat them better, offer better benefits and working conditions, and provide more work (per day per season). Advantages of working for an FLC, however, include providing longer work seasons and lack of a language barrier.

[9]Note that an increase in national (or global) demand for commodities produced in these FLC-reliant areas could also lead to higher FLC shares of total H-2A employment.

The H-2A Agricultural Guest Worker Program

The H-2A Agricultural Guest Worker Program allows U.S. employers to recruit foreign workers to perform agricultural jobs. To be eligible for H-2A employment, the job must be seasonal or temporary. Moreover, employers must demonstrate that hiring H-2A workers will not have a negative effect on wages or working conditions of domestic farmworkers. To comply with this rule, employers must pay H-2A workers no less than the adverse effect wage rate (AEWR), which is set at the region's average hourly wage for crop and livestock workers in the previous year (Temporary Agricultural Employment of H-2A Nonimmigrants in the United States 20 C.F.R § 653, 655, 2019, p. 36171). Employers must also demonstrate that not enough domestic workers are willing, able, and available to fill the job. To abide by this rule, on their own and with the help of their local State Work Force Agency (SWA), employers must first try to recruit U.S. workers to fill the job opening.

To begin the application process, the employer submits a job order to the SWA 60 to 75 days before the work start date. The job order includes the number of workers requested, duration of employment, job duties, and employment benefits. It also specifies the workers' minimum number of weekly hours, and the hourly wages (Roka et al., 2017). If the job order complies with the regulatory criteria regarding wages, benefits, duration, and job type, the SWA approves it and begins recruitment efforts of domestic workers. Employers must accept SWA referrals of qualified U.S. workers who apply for the position (U.S. Department of Labor, 2012).

For the next step, alongside the approved job order, the applicant submits ETA Form 9142 Application for Temporary Labor Certification to the Department of Labor (DOL) no less than 45 days before the work start date. The employer certifies knowledge and compliance with all requirements of H-2A employment, then advertises the job opening to U.S. workers via an online platform provided by the DOL (SeasonalJobs.dol.gov).[10] The application may be submitted by an individual U.S. employer (e.g., an agricultural producer or a farm labor contractor), or a group of producers that will jointly employ the workers (e.g., a growers association).[11, 12] The applicant may request that multiple positions be certified in a single application. In our period of study, the number of positions requested per application ranged from one to more than one thousand. The labor certification form is the primary source for the data we use in this study.

Two other Federal agencies are involved in the H-2A visa application process: U.S. Citizenship and Immigration Services (USCIS) and the U.S. Department of State (DOS). Once the DOL grants temporary labor certification, the employer submits an I-129 Petition for Nonimmigrant worker to the USCIS, outlining the terms of employment and other worker and employer characteristics. Once the I-129 is approved, if the potential H-2A candidate is abroad, the candidate submits the approved I-129 alongside

[10]Before October 2019, in addition to posting the job order with the SWA, employers were required to advertise the job opening in a newspaper in the area of intended employment (U.S. Department of Labor, 2020; Modernizing Recruitment Requirements for the Temporary Employment of H-2A Foreign Workers in the United States 20 C.F.R. § 655 , 2019).

[11]Growers associations typically consist of multiple farms. These associations are frequently nonprofits—for example, the North Carolina Growers Association and the Western Growers Association—and serve to promote the professional interests of their member farms. Growers associations may advocate for policies that benefit their member farms, such as pest control, environmental sustainability, water rights, and guest worker programs.

[12]Many applicants hire firms that help them navigate the H-2A administrative process and file the application forms on their behalf. In some cases, these "H-2A consultants" also recruit workers on behalf of U.S. employers (Roka, Simnitt, & Farnsworth, 2017).

other application documents to the DOS at a U.S. consular office in his or her home country. [13] The DOS is the agency that ultimately issues the visa (U.S. Mission to Mexico, 2011). [14]

Instituted as the H-2 program in 1952 and revised in 1986, the H-2A program was rarely used until recent years. Employers and critics have long argued that the process to employ workers on H-2A visas is costly and bureaucratically cumbersome, which dissuades many farmers from participating in the program (Roka et al., 2017; Martin and Taylor, 2013). In addition to the recruitment and minimum wage costs, H-2A employers have other expenses not incurred if they choose to hire locally. For example, employers must pay for application and visa processing fees, transportation to and from the worker's country of origin, and daily transportation to and from the worksite. Employers must also pay for H-2A worker housing which can be challenging. For example, in rural areas housing may not be readily available so the employer must either build housing on or near the worksite or pay for workers' transportation from a distant location. In many urban areas, the cost of housing is so high that H-2A participation is prohibitive to many producers. Housing rules state that employers provide either cooking facilities or daily meals to the worker.[15] [16]

H-2A program rules are frequently updated to adjust to evolving market conditions and changes in Federal immigration policy. Congressional bills calling for more substantial changes to the existing H-2A program or its complete replacement with a new guest worker program are occasionally proposed by legislators. The Farm Workforce Modernization Act (FWMA) was passed by the 116th U.S. Congress (2019) and is awaiting approval in the U.S. Senate. The FWMA proposes several major changes to the H-2A program. Proposed changes include limits on how much the AEWR can increase for the next nine years, streamlining the H-2A filing process,[17] and increasing the initial duration of stay, from one to three years. The FWMA would also give certain industries with year-round labor requirements (e.g., dairy), access to the H-2A program and would provide additional safety and healthcare benefits for workers. The bill also establishes a program that provides a pathway to legal resident status for qualifying unauthorized immigrant farm workers. The FWMA seeks to balance the demands of employers for affordable and accessible farm labor with the primary concerns of workers, whether unauthorized immigrants or H-2A workers.

Despite its high costs—both in terms of wages and other costs—employers increasingly use H-2A to fill temporary agricultural jobs. As traditional labor sources dry up—either because seasonal agricultural jobs are less appealing to a younger generation of more highly educated workers (both domestic and foreign) or because of increased scrutiny of illegal immigration—an H-2A labor-force is an increasingly attractive option for agricultural employers. Since 2010, H-2A employment has surged with the total number of H-2A posi-

[13]If the prospective employee is already in the U.S. under another visa status, the USCIS adjusts the status of the worker to H-2A without DOS involvement.

[14]An H-2A visa is initially valid for no longer than one year but may be extended up to three years, after which the worker must return to his or her country of origin and remain for at least three months.

[15]Each H-2A certification request is tied to a specific housing location. Therefore, in cases where a worker may be housed in multiple locations throughout his or her H-2A contract, the employer must submit to the DOL a separate application for positions for each of the housing sites.

[16]Other costs associated with H-2A employment include the following: In cases where the work crew consists of H-2A and non-H-2A workers, the employer must pay all workers the AEWR and must provide free housing to U.S. workers (C.F.R. 655.122(d)). Even after a H-2A worker has arrived in the U.S. and started to work, the employer is obligated to replace him or her with any eligible U.S. referrals within the first half of the period of the H-2A's work contract, a policy known as the "50 percent rule" (C.F.R 655.135(d)). The employer must provide transportation for returning the H-2A worker to his or her country of origin. Unless an eligible U.S. worker formally displaces them, H-2A workers are guaranteed employment for a total number of work hours equal to at least 75 percent of their contract's total workdays. This is referred to as the three-fourths guarantee rule and may only be foregone in the case of an Act of God (e.g., extreme weather event making fulfillment of the contract impossible) (C.F.R. 655.122(i)).

[17]FWMA proposes streamlining the filing process with an online portal through which employers would file with the SWA, DOL, and USCIS at the same time, as opposed to three separate steps.

tions certified by the DOL increasing from about 79,000 to about 258,000 in 2019.[18] Some employers find that hiring H-2As improves their economic prospects. The program provides a guaranteed, stable workforce to growers who in the past may have struggled with recruiting or retaining local immigrant workers hired on a seasonal basis. Some employees may view an H-2A agreement as a better alternative to previous work arrangements. An H-2A contract guarantees a minimum wage and number of hours worked for a defined period, which may be preferable to leaving one's home country for uncertain seasonal work.

[18]Though they closely track each other, the number of H-2A positions certified each year is generally greater than the annual number of H-2A visas issued by the DOS due to a variety of factors. A single H-2A visa holder may be certified to perform multiple positions certified by the DOL; a position certified by the DOL in a given year may end up going unfilled; or a certified position may be filled by a worker holding an H-2A visa issued in a previous year.

H-2A Data

The trends in H-2A use described in this report use publicly available H-2A case disclosure files obtained from the DOL's Office of Foreign Labor Certification (OFLC) website for 2010-19. On the temporary labor certification form, the source of these files, the DOL collects a wealth of information about H-2A employers such as employer name and address, worksite location, proposed wage rate and hours worked, the number of workers requested, and how many workers were certified. For 2013-19, information on whether the petitioner is an individual firm, a farm labor contractor, or a growers association is also available.

The basis for our analysis are data on the primary crop associated with the H-2A petition, which are the best data available to classify petitions by sector. Unfortunately, primary crop data are not available in all years. Even in years that provide primary crop data, some applications are difficult to sort into sectors because their commodity description includes only a broad occupational category (e.g., agricultural equipment operators, general farm workers, etc.).

We address these data limitations by first mapping primary crop names to sectors (vegetables and melons, field crops, nursery and greenhouse, fruit and tree nuts, and animal products).[19] We then use the job title and NAICS descriptions to categorize the applications without an explicit crop reference. Finally, we link firms over time to transfer crop information from years where it is available to years where it is missing. For years without crop information, we assign a sector to a firm's applications based on the sector assigned in other years. Motivating our approach is the fact that the overwhelming majority of employers' sector categories are consistent within and across years. We link firms by employer name and zip code using probabilistic record matching techniques ("fuzzy matching") to deal with variations in the spelling of employer names in different years. Because many employers are repeat users of the H-2A program, we can match about 90 percent of records. See the Appendix for a full description of these procedures.

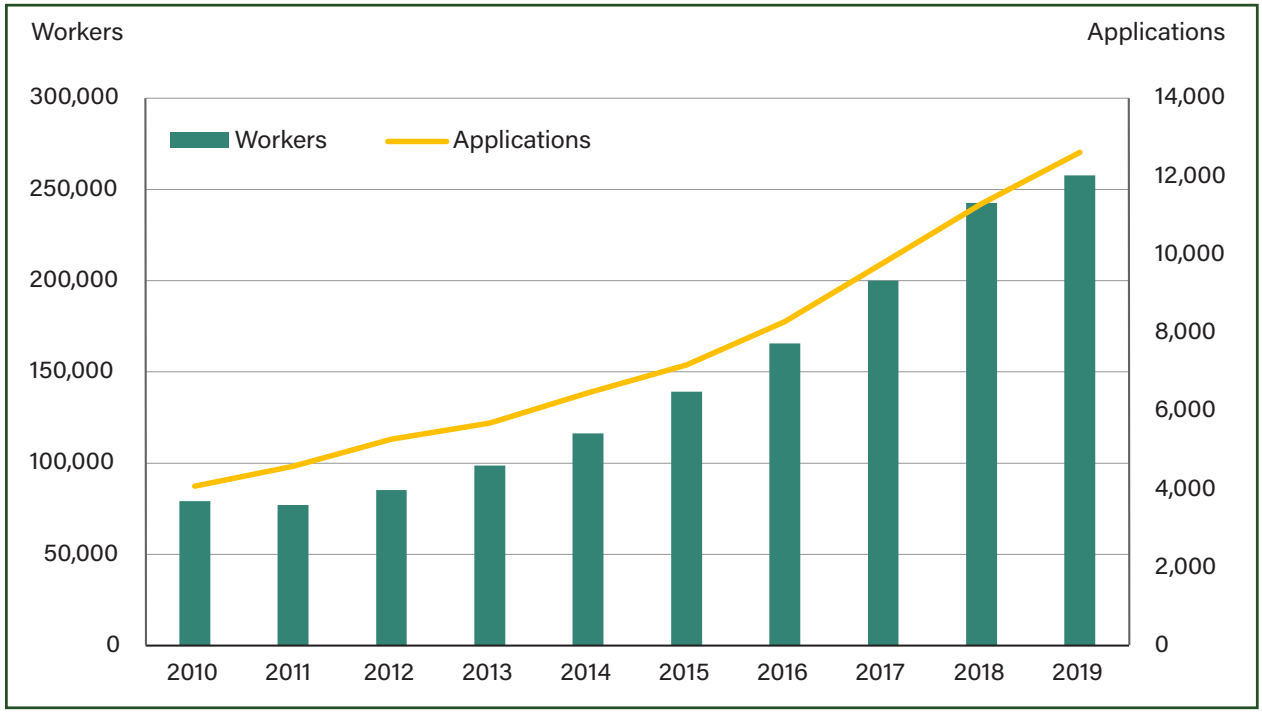
[19]We choose "sectors" to broadly align with four-digit NAICS industries for crop agriculture. Because animal production is not well represented in the H-2A program, we combine all animal production into a single sector.

Trends in H-2A Usage

H-2A Usage Increases Nearly Fourfold

While the H-2A program accounts for a relatively small portion of total U.S. agricultural employment, in the past ten years, the program has rapidly grown.[20] The total number of H-2A positions certified by the DOL grew each year since 2011, at an average annual rate of 16.4 percent, reaching a record high of 257,674 workers in 2019 (figure 1). From 2014 to 2018, H-2A certifications grew 18-21 percent each year. Only in 2019 did annual growth slow to 6 percent. The number of filed applications grew at nearly the same pace and reached a record of 12,615 in 2019.[21] It is uncertain if this recent slowdown in program growth indicates a new equilibrium in the domestic farm labor market or if it is because of a reduced supply of H-2A labor. The average duration of an H-2A certification in 2019 was 5.3 months, implying the 257,674 positions certified that year represented approximately 114,000 full-year jobs.[22]

Figure 1
H-2A Workers and applications, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

In 2019, Florida, Georgia, Washington, California, and North Carolina employed the most H-2A workers, with over half of all H-2A workers certified nationally (figure 2.2). [23] While most of the change in certifications from 2010 to 2019 came from these five States (61 percent), H-2A employment increased in virtually every State. A strong positive relationship exists between the size of a State's hired agricultural workforce and

[20]Using the number of visas issued by DOS and employment data from the Quarterly Census of Employment and Wages (QCEW), Costa and Martin (2020) estimate that in 2019 10 percent of crop workers are H-2A.

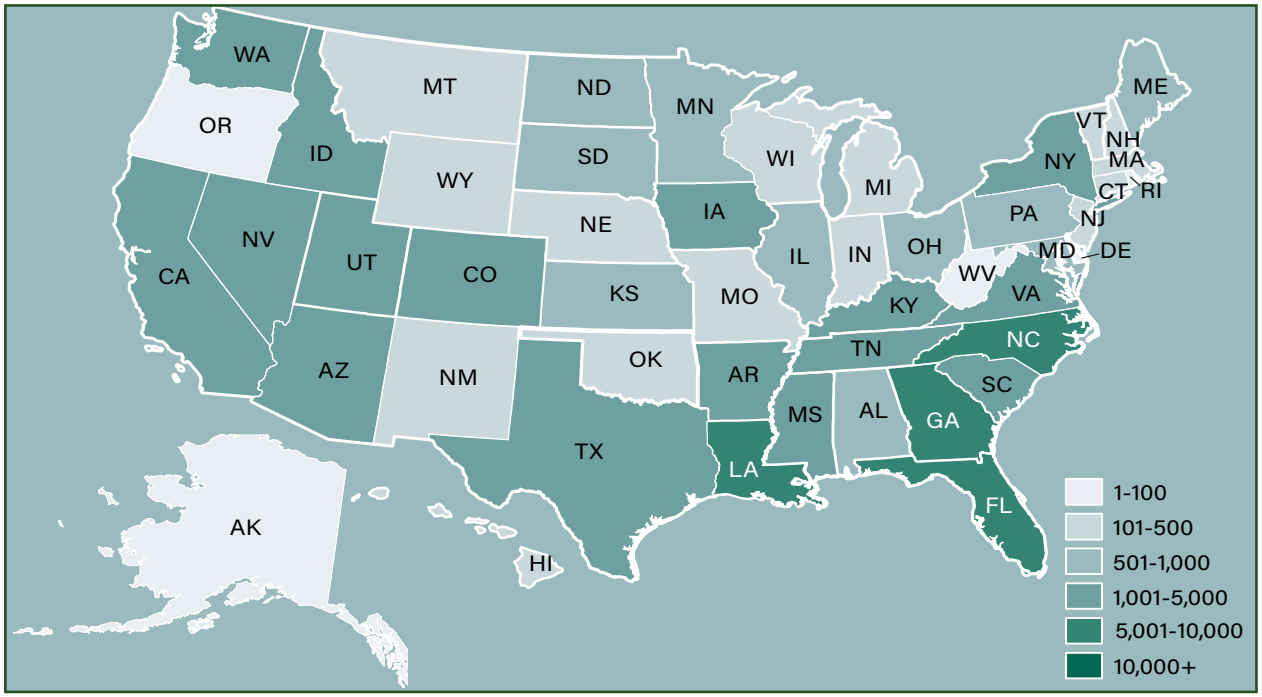
[21]Most recently applications are growing at a slower pace than the number of workers certified, suggesting that approved applications are growing larger over time.

[22]The Appendix shows an approximation of the number of sponsors participating in the program. From 2010 to 2019 the number of sponsors roughly doubled, from about 5,200 to about 10,100. Identifying unique sponsors in the data is complicated by the fact that there are multiple spelling variations for employer names. We deal with this issue by standardizing company names using the Stdn_compname command in Stata.

[23]In the Appendix, we show the top commodities produced by H-2A workers in these States.

its H-2A use, but this relationship is not one-to-one. In 2019, Georgia had a much smaller agricultural workforce than California and Texas, yet Georgia had more certifications than both States combined. [24, 25] Large differences exist in how intensively States use the H-2A program. In figure 2.3, we show the ratio of H-2A full-year jobs in 2019 to total agricultural labor expenditures across States.[26] The Southeast uses H-2A labor more intensively than other regions. California and Texas, two of the largest agricultural employers in the United States, use the H-2A program at much lower intensities than other large agricultural employers such as Florida and Washington, as well as much smaller agricultural States such as Nevada and Louisiana.[27]

Figure 2.1
Geographic distribution of H-2A workers for all sectors, 2011



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

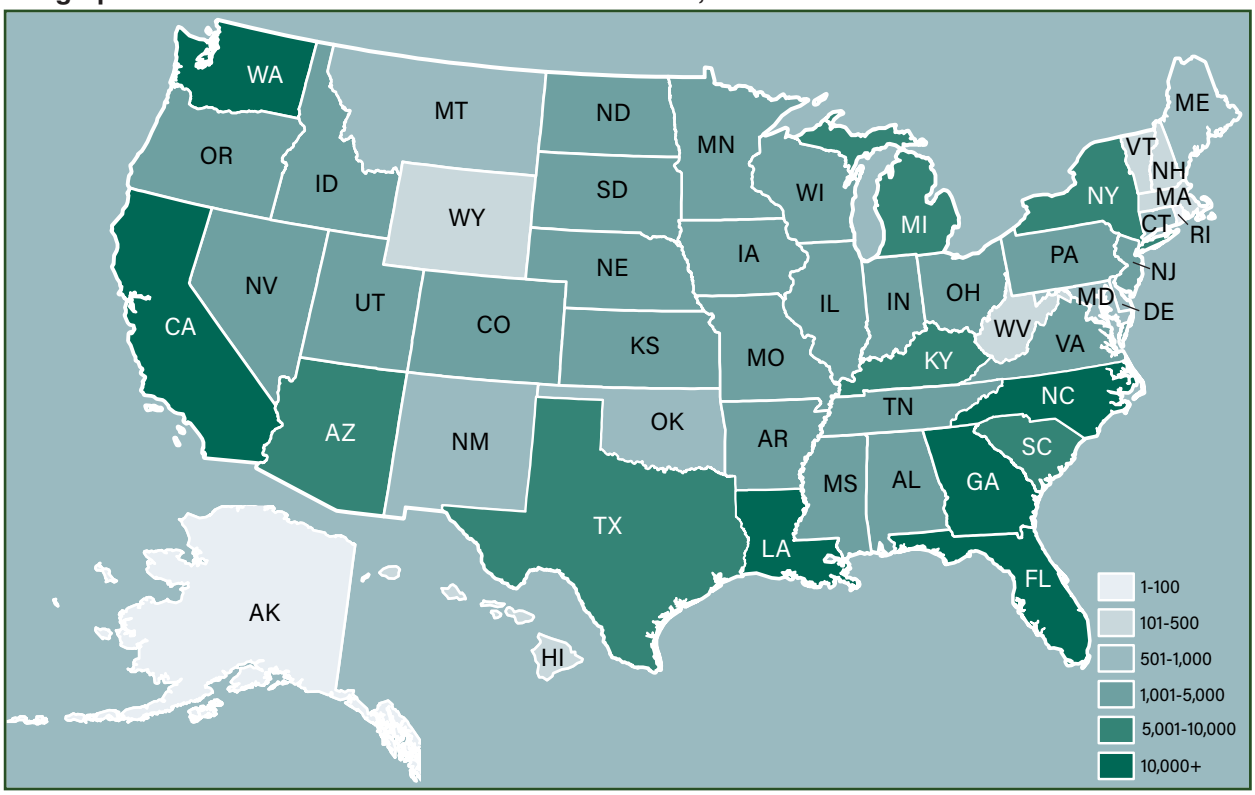
[24]Data from the U.S. Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW) shows that in 2019 the state share of average U.S. wage and salary employment in agriculture was highest in California (35 percent), Washington (8.2 percent), Florida (5.4 percent), Texas (4.8 percent), and Oregon (3.9 percent). North Carolina was 11th in the rankings with 2 percent and Georgia 15th with 1.7 percent. It is worth nothing that the QCEW is based on unemployment insurance records. As such, it does not cover smaller farm employers in States that exempt such employers from participation in the unemployment insurance system. Moreover, the QCEW only covers H-2A workers in some States.

[25]In 2019, Georgia had 29,500 certifications, California 23,300, and Texas 5,000.

[26]State-level agricultural labor expenditures are drawn from the 2017 COA. Intensity is measured in terms of jobs per dollar because the QCEW does not always count H-2A workers. These patterns are notably similar if H-2A intensity is measured as the ratio of H-2A full-time equivalent workers to QCEW employment.

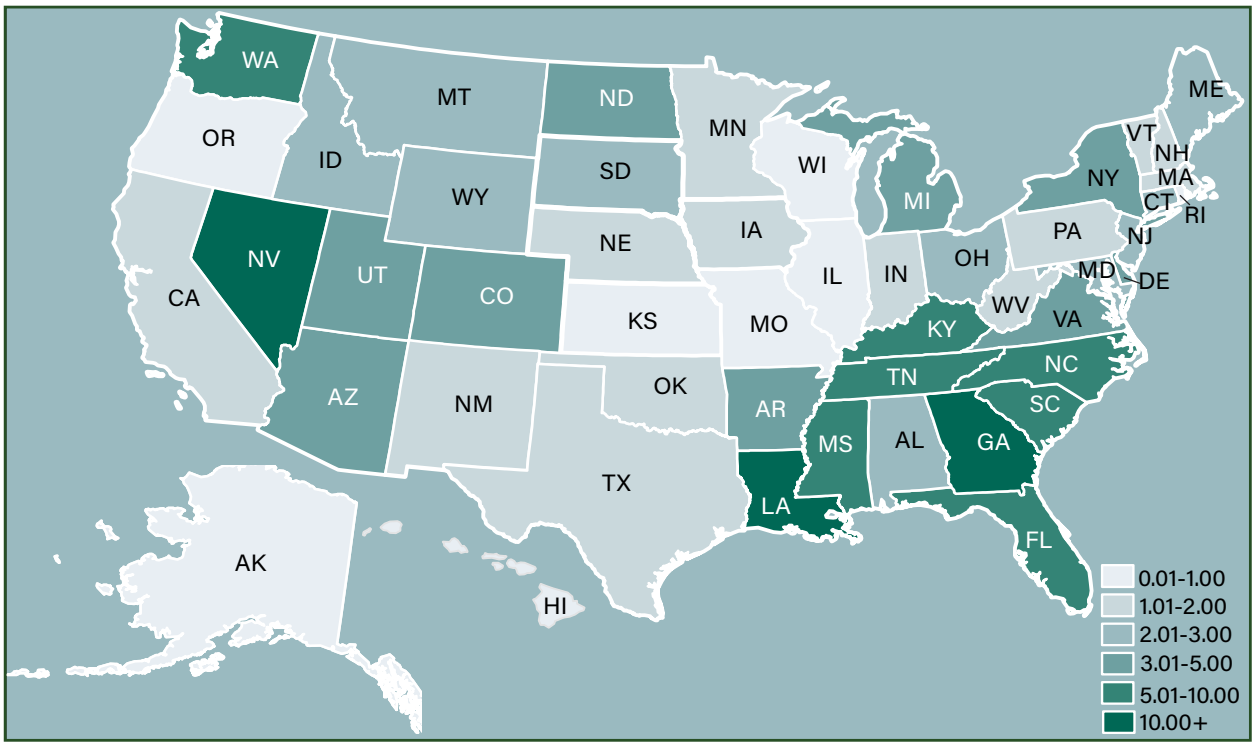
[27]In addition to differences in the commodities produced, other explanations may account for why some States use relatively more H-2A than others. For example, migration networks may differ across regions. It is also possible that competition for workers from non-agricultural industries varies across States. Moreover, the costs of accessing the H-2A program are likely different across States. Some reasons why costs may differ include differences in access to filing intermediaries that help farmers learn to navigate the program, AEWRs, and housing costs. Furthermore, social learning among employers may play a role. Potential employers in close proximity or who have social contact with others already using the program may have an easier time learning how to use it through information sharing or imitating their neighbors' behavior. Sorting out the relative importance of these explanations is far beyond the scope of this report.

Figure 2.2
Geographic distribution of H-2A workers for all sectors, 2019



Sources: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure 2.3
Ratio of H-2A full-year jobs to total labor expenditures (millions of U.S. dollars), 2019



Sources: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification and 2017 Census of Agriculture.

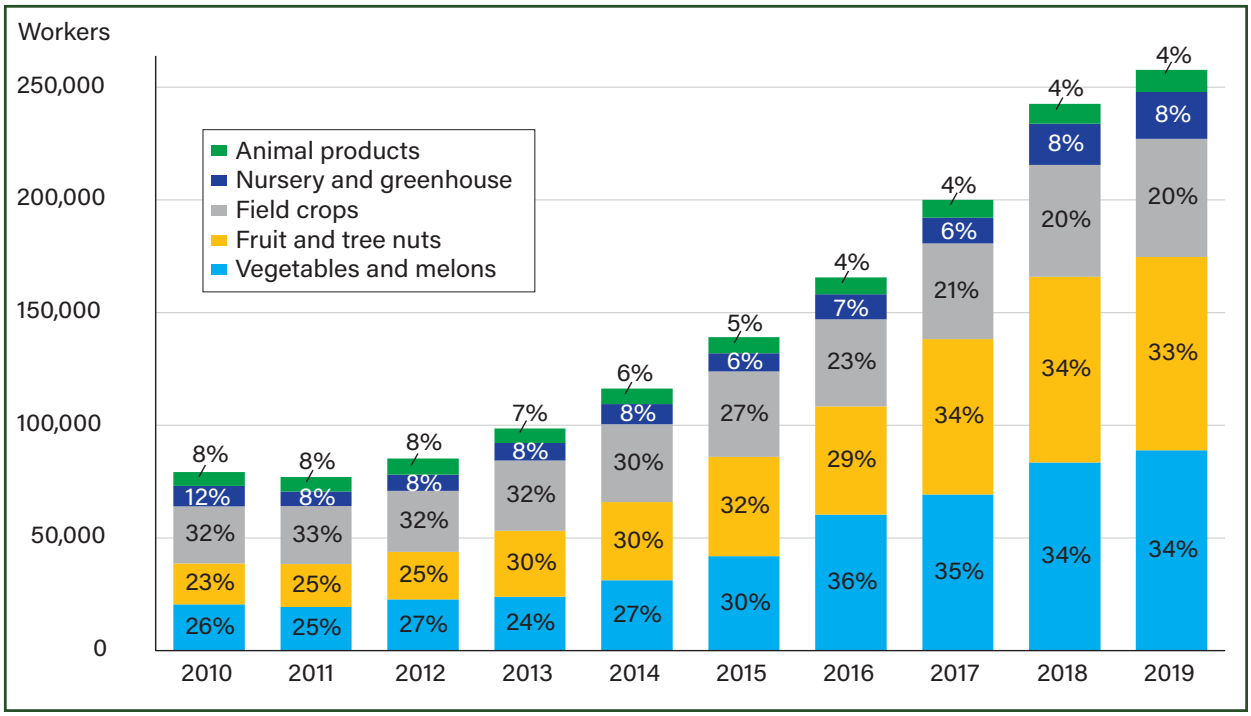
Vegetable and Melon Producers are Top Users of H-2A

According to the 2017 COA, production of vegetable and melon crops (including potatoes, mushrooms, and sweet potatoes) accounted for $19.6 billion in sales (5 percent of the U.S. total sales) with commercial production of some vegetable or melon crops in nearly every State (NASS, 2019). In contrast to many traditional program crops (e.g., corn, wheat, soybeans, etc.), production of many vegetable and melon crops is labor-intensive. Much of the planting, harvesting, and packing of vegetables and melons destined for the fresh market must be done manually by hired labor. This is especially true for delicate or perishable commodities with stringent quality requirements destined for the fresh market. In 2017, 60 percent of vegetable and melon acres were harvested for the fresh market, with 40 percent harvested for the processing market (NASS, 2019). Vegetable and melon crops destined for processing, where preserving the aesthetics of delicate products is less important, are generally produced with high levels of mechanization like traditional program crops.

Because of its labor-intensity, even though the vegetable and melon sector is relatively small in terms of total sales, labor expenditure is especially high. The sector accounts for only 5 percent of total U.S. agricultural sales, yet 12 percent of total agricultural expenditures on labor (table A-5). These high labor requirements are undoubtedly one reason why the sector is the largest H-2A employer (figure 3) since 2016. The number of H-2A positions in the sector grew more than fourfold from 20,584 in 2010 to 88,863 in 2019.

Figure 3

H-2A workers by sector, 2010-19



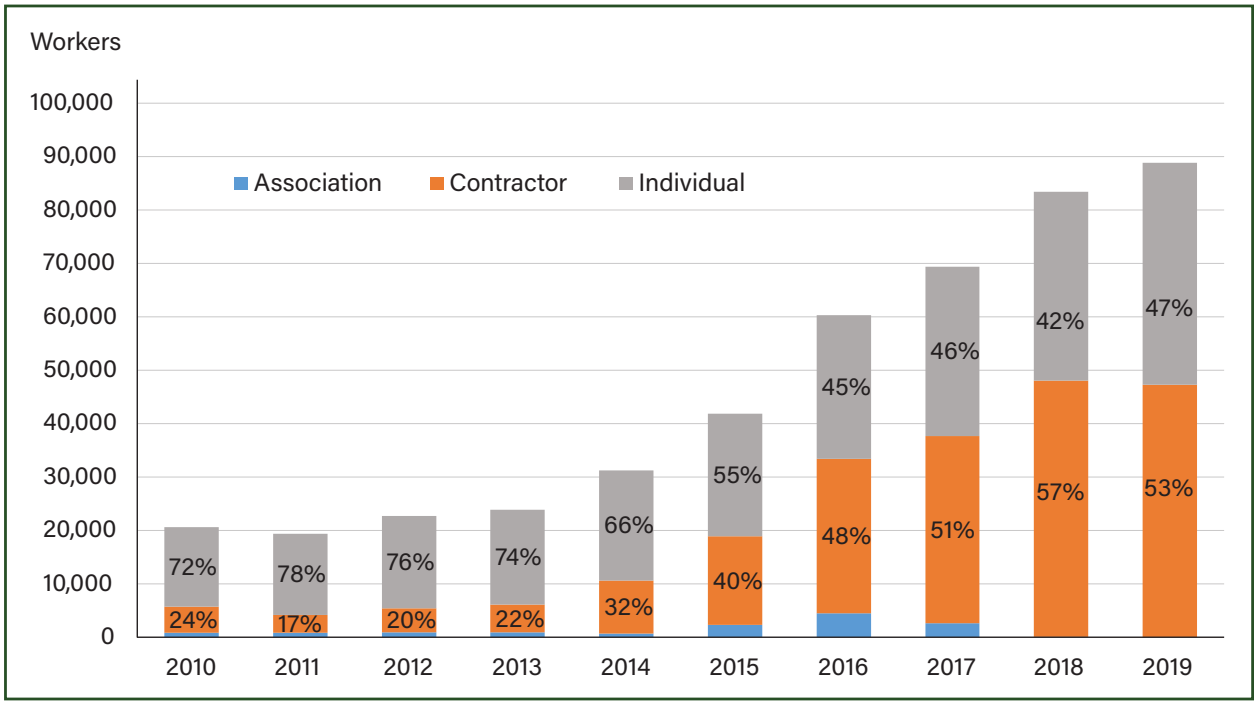
Note: Percentages may not add to 100 due to rounding.

Source: USDA Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Individual employers and FLCs are the dominant H-2A employer type in the vegetable and melon sector, with the share of positions requested by a growers association being less than 8 percent over 2010-19 (figure 4). The number of certifications obtained by both individual employers and FLCs increased every year between 2011 and 2019; however, the number of certifications obtained by FLCs increased faster, which led contractors to overtake individual employers in 2016. The share of certifications obtained by FLCs steadily

increased from 17 percent in 2011 to its maximum of 57 percent in 2018, decreasing slightly in both share and number in 2019.

Figure 4
Vegetable and melon sector H-2A workers by employer type, 2010-19



Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Perhaps unsurprisingly, FLC prominence in the H-2A program for vegetables and melons is because contract labor plays an important role in production of these crops. In 2017, the contract share of total labor expenditures in this sector was about one-third, which is much higher than in most other agricultural sectors. Moreover, although 12 percent of total labor expenditures, the vegetable and melon sector accounts for 20 percent of all U.S. expenditures on contract labor (Martin and Taylor, 2013).

The growing share of H-2A employment by FLCs may suggest that it is now more difficult for FLCs to recruit domestically, prompting them to turn their recruitment efforts abroad. However, this growth may also be because individual firms that have difficulty hiring locally find it more economical to use labor contractors to navigate the H-2A application and recruitment process than to do it themselves. Employing H-2A workers tends to be more expensive than hiring locally because employers must pay for application and recruitment fees, the AEWR, and travel and housing costs. These costs are likely prohibitive to many small producers seeking workers for short-term contracts. An FLC, on the other hand, can effectively share the cost of application fees, travel, and housing among multiple producers, which could make the hiring of H-2A workers through FLCs more feasible.

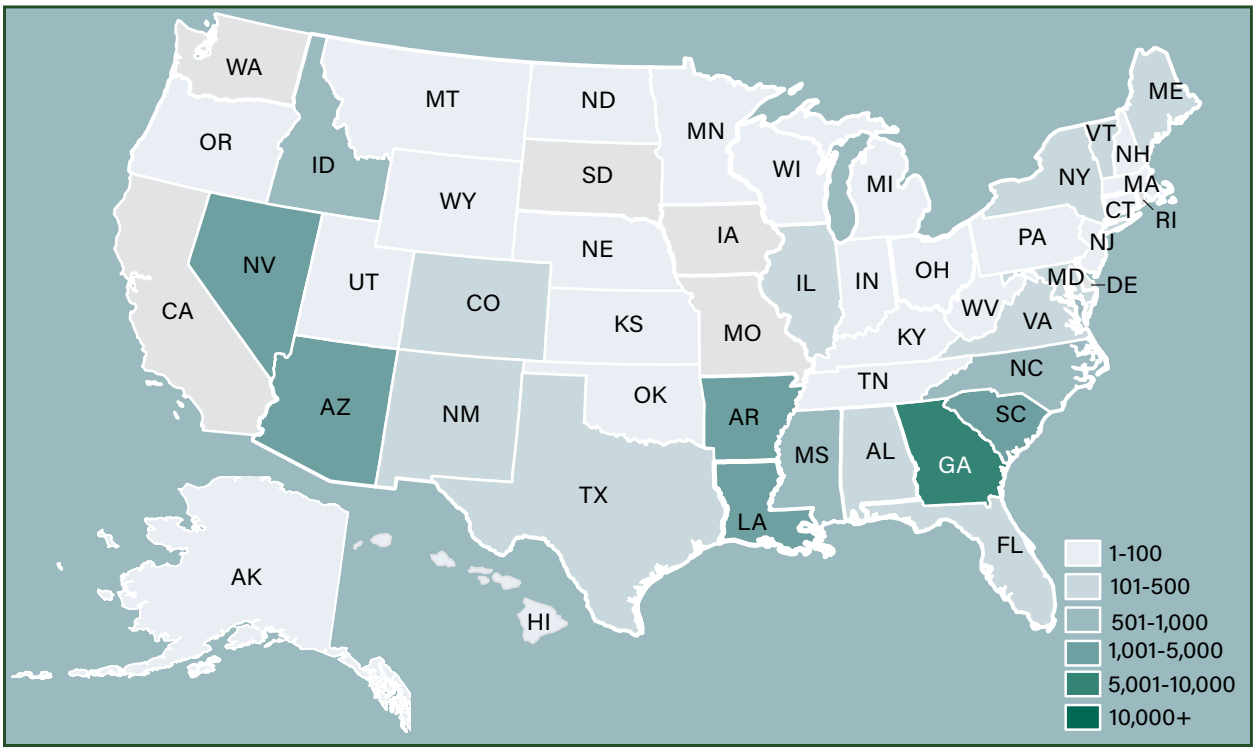
According to the 2017 COA, California accounted for about 50 percent of national expenditures in contract labor. Florida had the second highest share at 6 percent, followed by North Carolina at 4 percent, Texas at 3.75 percent, Washington at 3 percent and Oregon at 2.25 percent. A positive relationship exists between the size of a State's expenditures in contract labor and the number of H-2A workers employed by FLCs; however, this relationship is not perfect. While most expenditures on contract labor are in California, only 15 percent of H-2A FLC employment is in that State. Florida (26 percent) and Georgia (20 percent) have by far the two highest State shares of total FLC employment of H-2A. As shown in figure 2.2, Florida and Georgia use the H-2A program at much higher rates than California.

The OFLC data contains separate variables for the State in which the employer is located (the "employer State"), and the State in which the workers will be employed (the "worksite State"). Another interesting pattern in the OFLC disclosure data is that while about 26 percent of the H-2A workers sponsored by FLCs have a Florida worksite State, about 45 percent of the total have a Florida employer State. With very few exceptions, for individual employers and growers associations, the State of the employer is the same as the State of the worksite. For FLCs, however, the share of H-2A for which the employer State and the worksite State differ is over 30 percent. This pattern is primarily driven by Florida-based FLCs "sending" about half of all workers they sponsor to 25 other States.

H-2A workers in the vegetable and melon sector are more equally distributed across the country than in other sectors. Satellite imagery data of agricultural plots for 2018 for example, detected significant vegetable and melon production in all 48 lower States, while production of fruit and tree nuts was observed in 44 States.[28] In 2019, melon producers were the largest H-2A users in the sector, accounting for 16.9 percent of certifications (table 1). Producers of tomatoes come in second at 8.9 percent, followed closely by lettuce at 8.7 percent, and sweet potatoes at 8.4 percent. Cucumbers, onions, and peppers range between 4.6 and 6.5 percent of the total, and their inclusion is not surprising considering they rank, along with potatoes and sweet corn, as the top vegetable and melon crops in per capita availability (Parr, 2019). A nonspecific category, "vegetables," was indicated as the primary crop on 7.3 percent of H-2A applications and may include some of the above-mentioned categories.

Figure 5.1

Geographic distribution of vegetable and melon H-2A workers, 2011

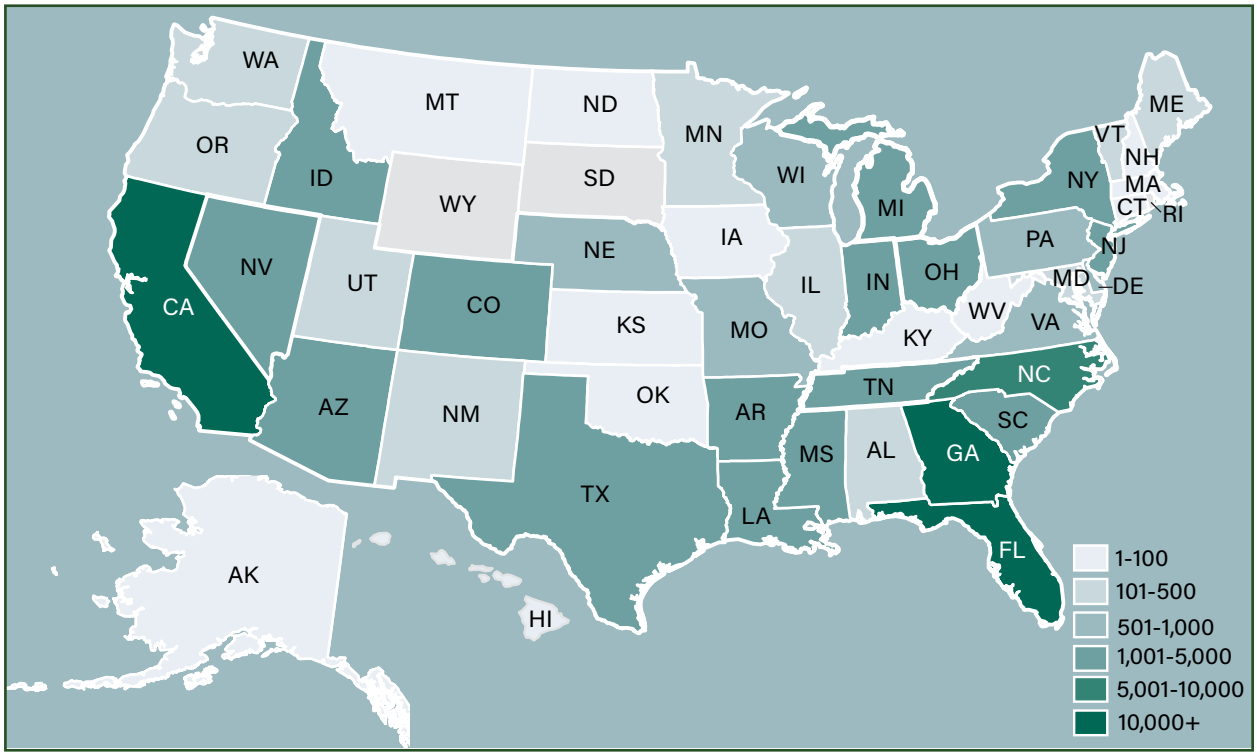


Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

[28]Satellite imagery data are available from NASS's CropScape only for the lower 48 States. Thus, these data exclude Hawaii and Alaska.

Figure 5.2

Geographic distribution of vegetable and melon H-2A Workers, 2019



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Florida, Washington, Georgia, California, and North Carolina were the top five users of total H-2A labor in 2019. These States, except for Washington, were also major producers of commodities in the vegetable and melon sector listed in table 1. North Carolina, a leader in the production of sweet potatoes, an industry exhibiting strong growth, ranks among the top five H-2A States for the entire decade.

Table 1

Breakdown of aggregate crop categories by primary crop of H-2A jobs certified, 2019

Crop category	Primary crop	Percent of total
Animal products		
	Open range livestock	47.3
	Bees	19.8
	Crawfish	15.6
	Horses	4.7
	Fish	3.9
	Chickens	3.1
Field crops		
	Tobacco	38.5
	Corn	19.3
	Sugarcane	13.5
	Hay and straw	6.9
	Grains	3.7
Fruit		
	Apples	17.9
	Blueberries	16.6
	Strawberries	14.7
	Citrus	12.2
	Cherries	8.2
	Fruits	8
	Peaches	4
Nursery and greenhouse		
	Nursery and greenhouse workers	57.9
	Christmas trees	17
	Trees	5.5
	Pinestraw	4.5
	Hemp	4.1
Vegetables and melons		
	Melons	16.9
	Tomatoes	8.9
	Lettuce	8.7
	Sweet potatoes	8.4
	Vegetables	7.3
	Cucumbers	6.5
	Onions	6.3
	Peppers	4.6

Notes: Apples: apples, apple drops, and Fuji apples. Bees: bees and honey; Tobacco: tobacco and flue-cured tobacco; Corn includes sweet and seed corn; Lettuce: lettuce, Romain, and Iceberg; Citrus: citrus, oranges, and Valencia oranges; Melons: melons, cantaloupe, and watermelons; Open range livestock: open range livestock, cattle, sheep, livestock, and goats.
Some applications could not be sorted within a specific sector. These were aggregated into an "unspecified" category and proportionally distributed among the other five sectors. See Appendix for additional explanation.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Fruit and Tree Nuts Account for a Third of H-2A Usage

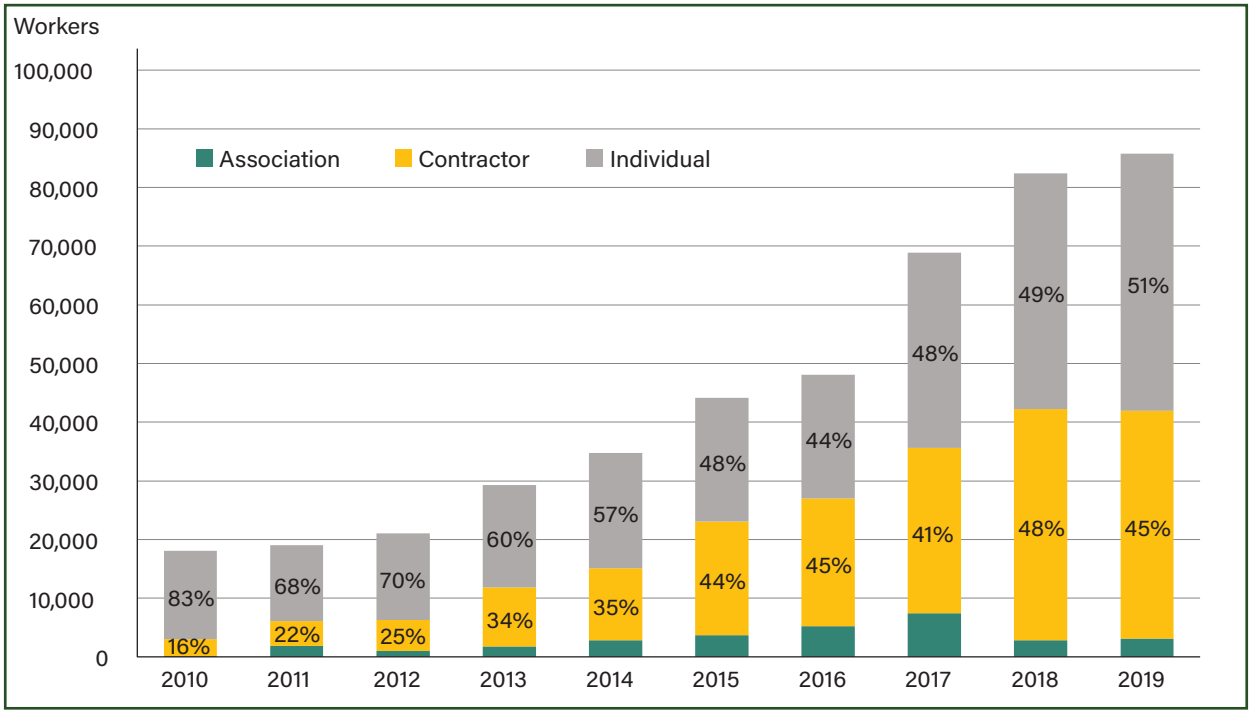
U.S. fruit and tree nut production accounted for $28.6 billion in sales in 2017 or 8 percent of agricultural product sales (NASS, 2019). California and Florida lead the country in production of fruit and tree nuts, with significant production also in Washington, Georgia, and Michigan. Like vegetable and melon crops, production of fruit and tree nuts is labor-intensive. Although tree nuts and many fruits destined for the processed market are now mechanically harvested, labor remains important in planting and pruning these crops. Additionally, fruits for the fresh market are still largely harvested, packed, and prepped by hand. In 2017, the labor share of total production costs in fruit and tree nuts was 38 percent, the second highest in U.S. agriculture (table A-4). When totaling labor expenditures in U.S. agriculture, the fruit and tree nuts sectors accounts for 23 percent, the largest share (table A-5). Meanwhile, total sales within the fruit and tree nuts sector account for only 8 percent of U.S. agricultural sales. This relatively large share of labor expenditures compared to a smaller share of agricultural sales confirms the labor-intensive nature of fruit and tree nut production.

Since 2014, fruit and tree nuts led other sectors in either first or second place (behind vegetables and melons) in number of H-2A certifications. H-2A positions in the sector grew from 18,085 in 2010 to 85,760 in 2019, with an average annual rate of growth of 20 percent and a peak annual growth rate of 43 percent in 2017 (figure 3). These large increases in H-2A labor within the fruit and tree nuts sector are likely caused by the high dependence on manual labor for cultivation and harvest of fruit and tree nut commodities, and the declining availability of traditional labor.

As with the vegetable and melon sector, individual employers and FLCs are the dominant H-2A employers in fruit and tree nuts. Certifications by a growers association account for less than 11 percent of all certifications in 2010-19 (figure 6). Certifications obtained by individual employers and FLCs increased every year between 2011 and 2019, although the number of certifications for FLCs increased at a faster rate. FLC certifications increased from 16 percent in 2010 to 45 percent in 2019.

Figure 6

Fruit sector H-2A workers by employer type, 2010-19



Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

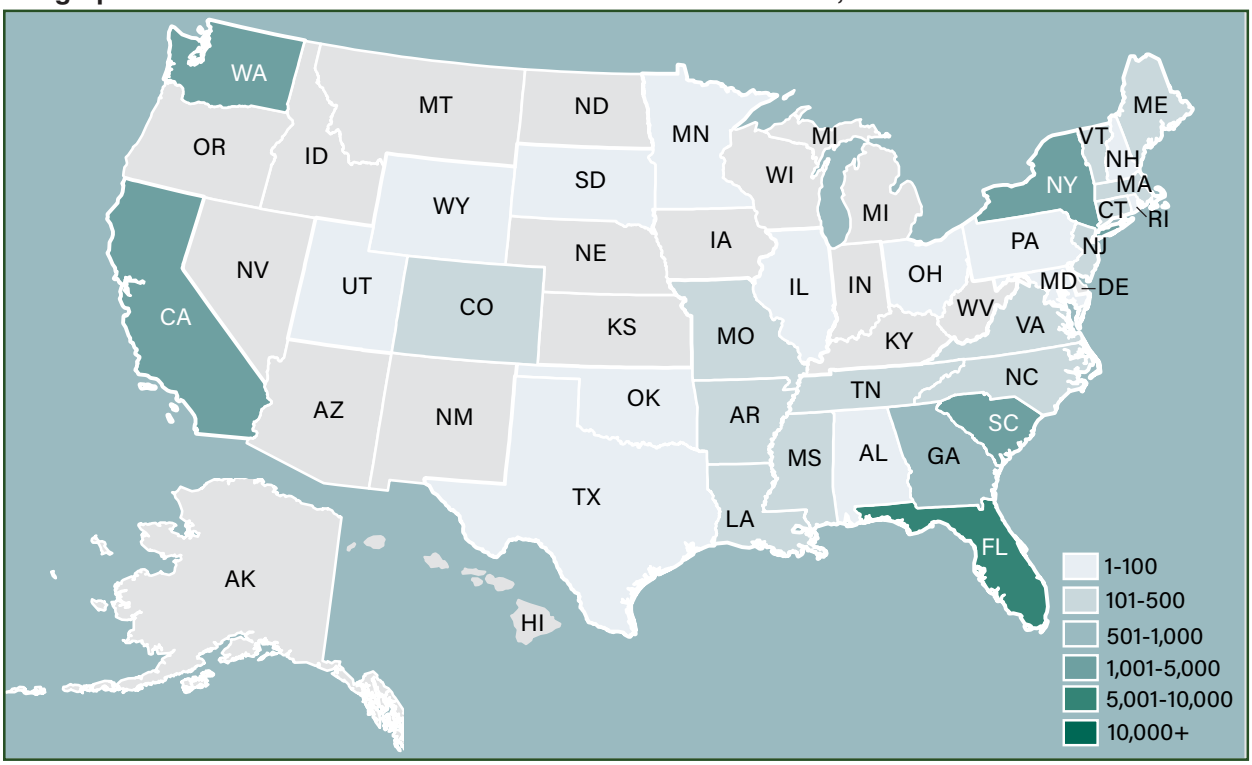
FLCs feature prominently among firms requesting H-2A workers because the fruit and tree nuts sector employs large quantities of contract labor. In 2017, contract labor accounted for 35 percent of the sector's total labor expenditures. Furthermore, the fruit and tree nuts sector accounts for 42 percent of total U.S. expenditures on contract labor.

Within the fruit and tree nuts sector, apples dominate in the use of H-2A workers, with 17.9 percent of the 2019 total (table 1). Blueberries and strawberries account for 16.6 percent and 14.7 percent of certifications, respectively, with citrus at 12.2 percent. Cherries account for another 8.2 percent of certifications and peaches for 4 percent. The nonspecific category "fruits" represents 8 percent of certifications, which may include previously mentioned products.

Washington, Florida, California, Georgia, and New York were the top five users of H-2A labor within fruit and tree nuts in 2019. The ranking of these States is a given as they lead in fruit and tree nut production. These States also experienced strong annual growth in H-2A employment since 2011, evident from the large changes in employment from 2011 to 2019 shown in figure 7. While the number of H-2A certifications in fruit and tree nuts increased for most States, growth is particularly high along the West Coast, the Southeast, and the Great Lakes region.

Figure 7.1

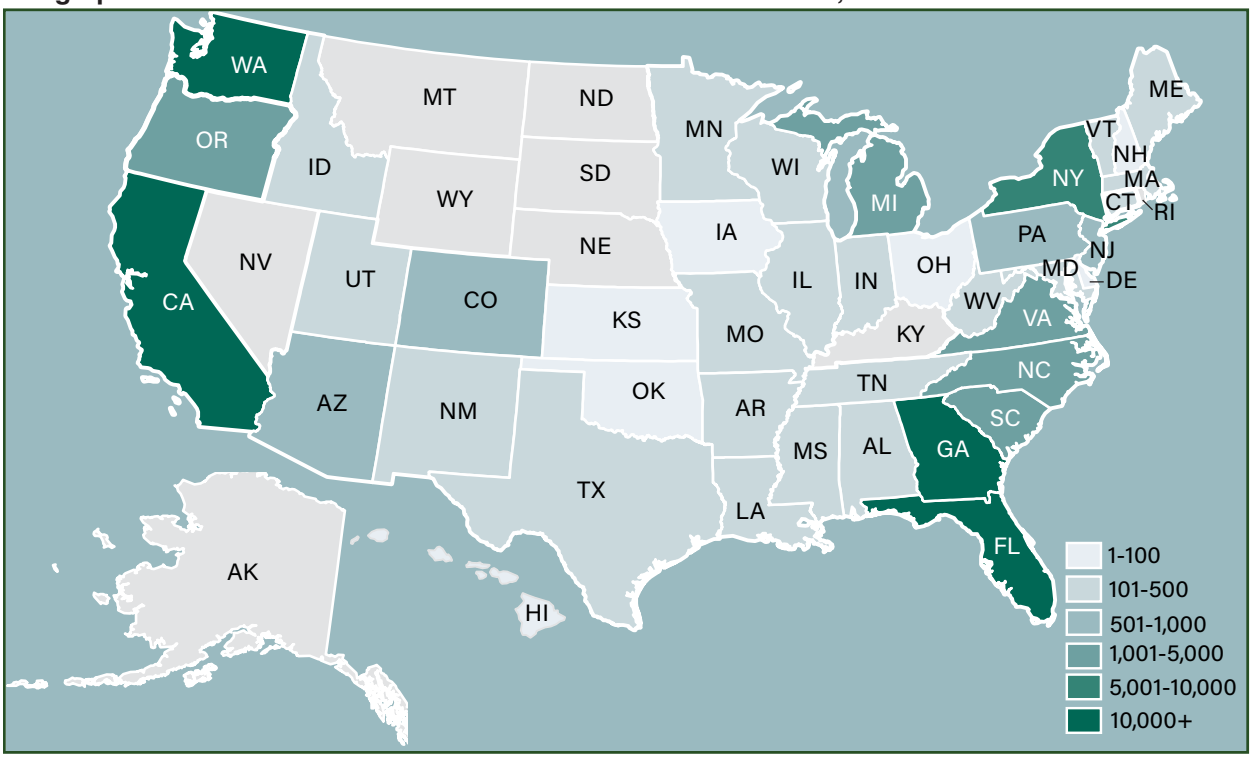
Geographic distribution of fruit and tree nuts sector H-2A workers, 2011



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure 7.2

Geographic distribution of fruit and tree nuts sector H-2A workers, 2019



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

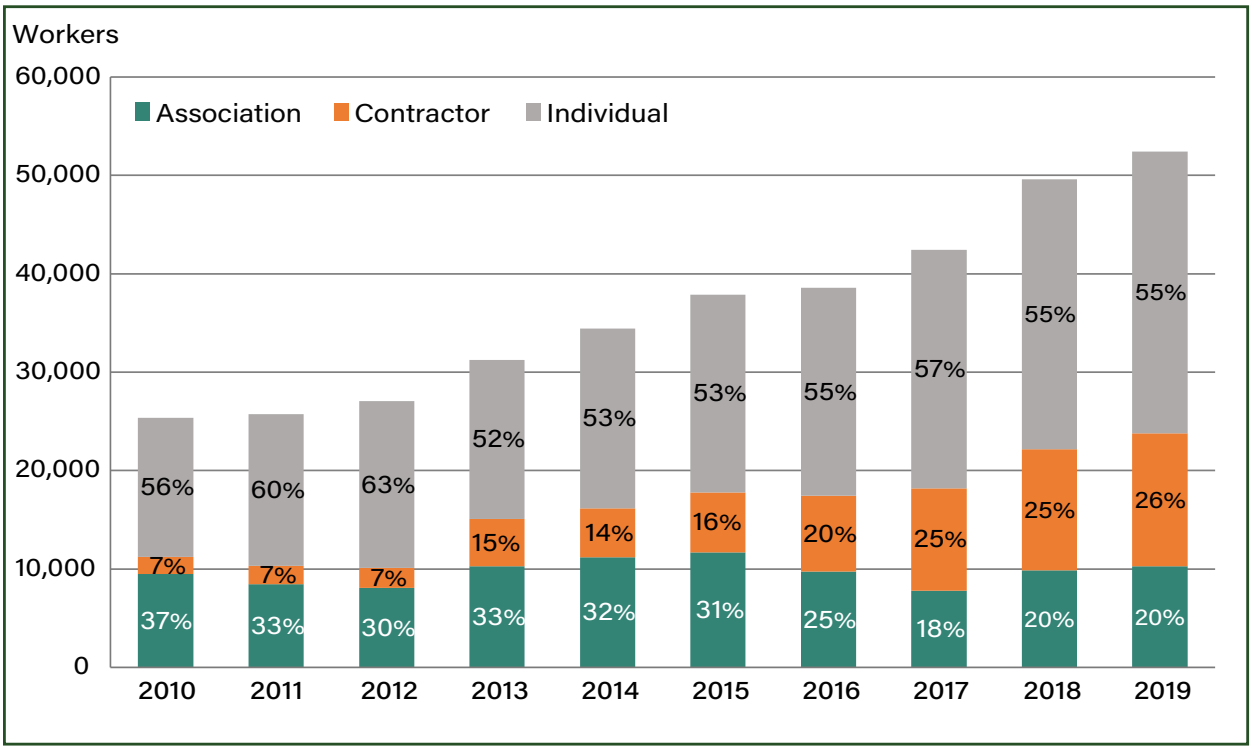
Field Crops Account for a Fifth of H-2A Usage

Field crops accounted for $128.8 billion in sales in 2017 or 33 percent of total U.S. agricultural product sales (NASS, 2019). This is nearly three times the value of fruit (including berries), tree nuts, vegetables, and melons combined. Field crop production is largely automated and most productive tasks use a relatively small labor force, often consisting of just the growers. Two tasks that remain highly manual within the field crop sector, however, are tobacco curing and seed corn detasseling.[29] Unsurprisingly, seed corn and tobacco account for the bulk of H-2A employment within the field crops sector.

From 2010 to 2019, the number of certified H-2A positions in field crops increased from 25,355 to 52,413. Field crops ranked as the single largest user of H-2A certified workers from 2010 to 2013. However, because growth in field crops has not kept pace with growth in other dominant sectors (fruit and tree nuts and vegetables and melons), its percentage of workers fell from a high of 33 percent in 2011 to a low of 20 percent in 2019 (figure 3).

Figure 8

Field crop H-2A workers by employer type, 2010-19



Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Individual firm applications remained steady, between 52 and 63 percent of certified positions within the field crops sector (figure 8). The share of certifications for use by FLCs increased from 7 percent in 2010 to 26 percent in 2019. Lower FLC growth in field crops, compared to fruit and tree nuts, and vegetables and melons, likely is because contractor employment is not as important in most field crops, except in tobacco production (27 percent contractor share of total labor expenses in 2017).

[29]All types of corn production are classified under field crops in this study including seed corn, grain corn, and sweet corn. Detasseling prevents a seed corn plant from self-pollinating its female flower with pollen from its male tassel. This process enables the hybridization of preferred traits from two breeds of corn. Rows of the two breeds are interplanted, and all rows of one breed are essentially rendered "female" by removing the tassels, first by machine and subsequently by hand. The production of high-quality seed corn requires high accuracy during the detasseling process.

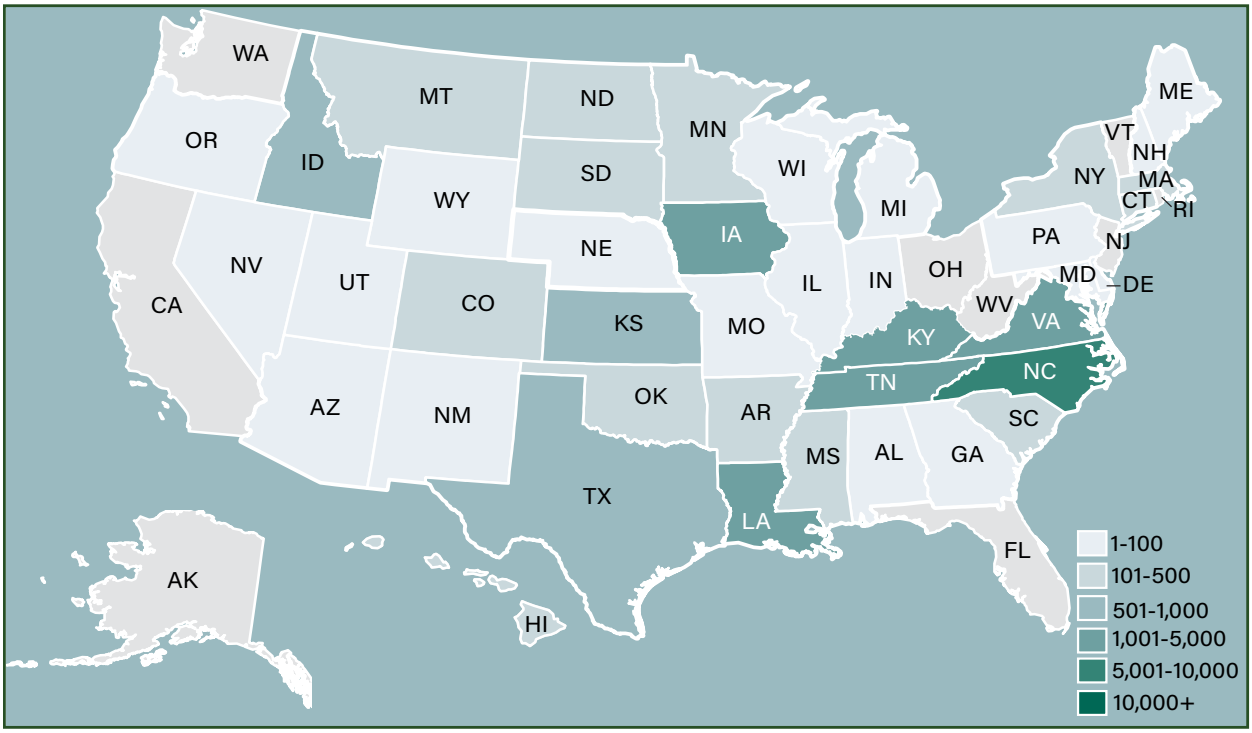
The share of H-2A workers hired through growers associations is much larger in field crops than in vegetables and melons or in fruit and tree nuts. Certifications granted to associations within the field crops sector decreased from 37 to 20 percent from 2010-19. One reason worker certifications for associations constitute such a large share of H-2A labor in the field crops sector is because the North Carolina Growers Association has historically played an important role in providing workers for North Carolina hay, straw, and tobacco growers. Since at least 2006, the first year in the disclosure files, the association is the single largest employer of H-2A labor in the country (OFLC, 2016; OFLC, 2011).

The dominant user of H-2A within field crops is tobacco, with about 40 percent of certified workers in 2019 (table 1). According to the 2017 COA, labor accounted for 25 percent of expenses in tobacco production, only slightly below vegetable and melon farming (28.8 percent) and much higher than total U.S. agriculture (12 percent). Corn, sugarcane, and straw and hay are next, with 19, 14, and 7 percent of certified H-2A workers, respectively.

North Carolina, Kentucky, Florida, and Louisiana are the top users of H-2A labor in 2019 for field crops. Idaho, Tennessee, and Virginia also use large numbers of field crop H-2A workers. Growth in the number of certifications for tobacco, specifically for North Carolina, Kentucky, and Virginia, is likely driving these numbers. In 2017, Louisiana grew 60 percent of sugarcane acres reported in the COA while Florida grew 20 percent (NASS, 2019).[30] The production of straw and hay and other grains may account for the relatively high usage rates in Idaho. Louisiana, Florida, North Carolina, and Iowa all show the largest amounts of growth in H-2A workers since 2011 (figure 9).

Figure 9.1

Geographic distribution of field crop H-2A workers, 2011

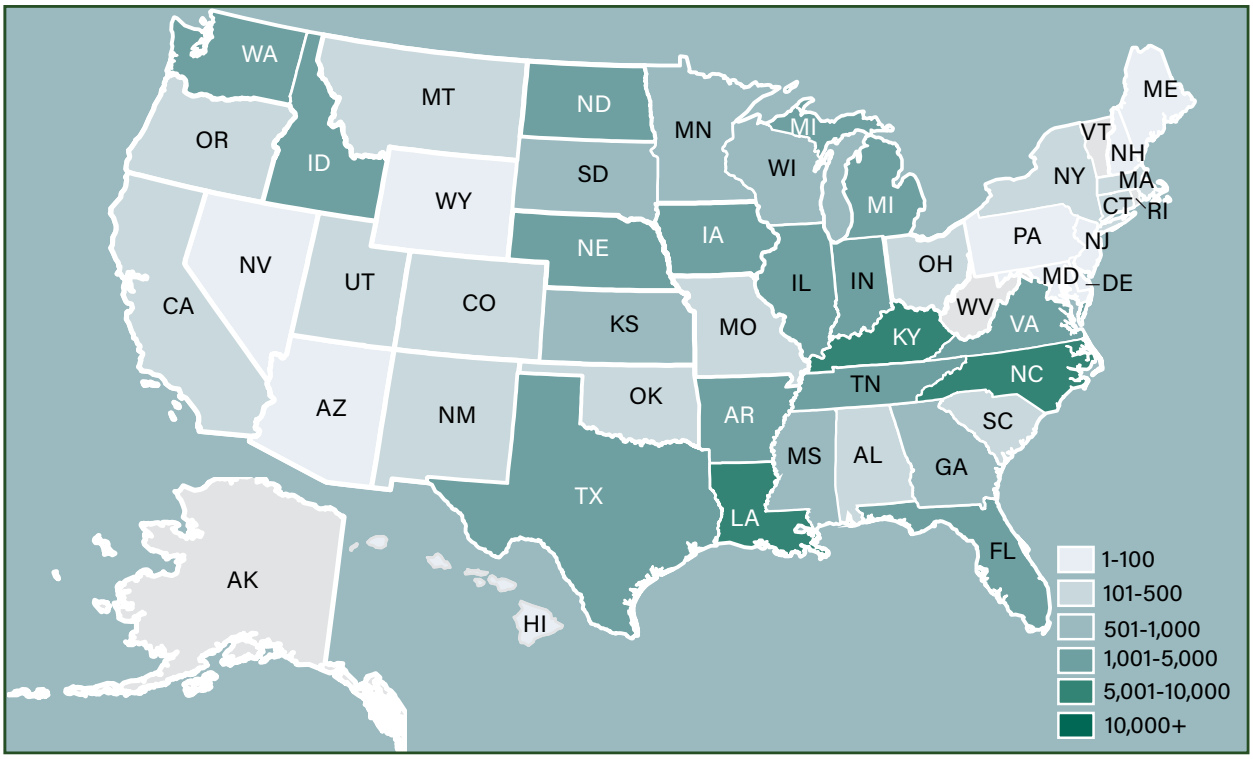


Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

[30]Because sugarcane cultivation requires a tropical or subtropical climate, it is only grown in three States (Florida, Louisiana, and Texas). While U.S. sugarcane production is highly mechanized, planting and harvesting requires skilled machine operators and milling requires skilled processing workers.

Figure 9.2

Geographic distribution of field crop H-2A workers, 2019



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

The field crops sector maintained a significant share of H-2A certified positions in 2019 (20 percent); however, this share is noticeably smaller than the fruit and tree nuts sector (34 percent) and vegetable and melon sector (33 percent). This lower relative use of H-2A is consistent with how field crops differs in its use of labor compared to the other sectors. Field crop sales account for 33 percent of all agricultural product sales compared to 5 percent from fruit and tree nuts sales and 8 percent from vegetable and melon sales. The successful use of mechanization accounts for lower use of H-2A labor by the field crops sector.

Nursery and Greenhouse Usage Doubles

Nursery and greenhouse operations (referred to as horticulture in the COA) accounted for approximately $16.2 billion in sales in 2017 or 4 percent of U.S. agricultural product sales (NASS, 2019). This category includes greenhouse-grown vegetables like tomatoes, peppers, and herbs as well as live nursery plants including trees, flowers, and sod. For nursery and greenhouse crops, labor accounts for a larger share of production expenses (43 percent in 2017) than in any other major sector (table A-4).

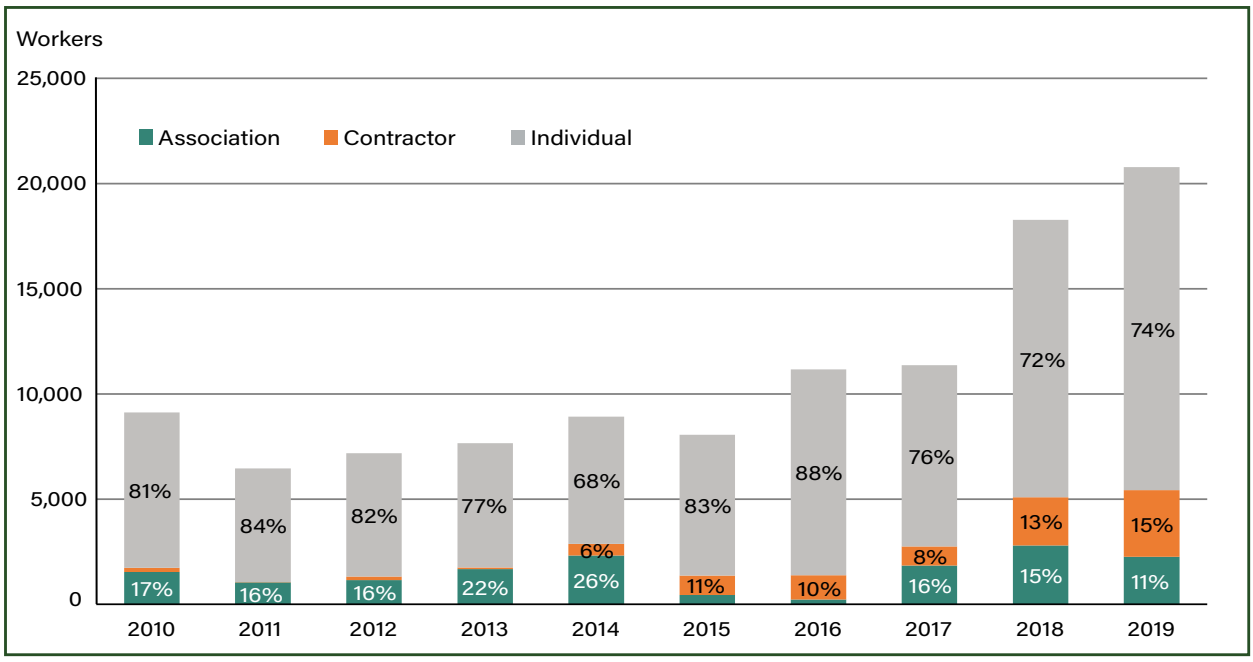
This sector, however, is the second smallest user of H-2A labor (ahead only of animal products), though certifications increased from 9,123 in 2010 to 20,770 in 2019. The percentage of total H-2A certifications fluctuated between 6 and 8 percent between 2011 and 2019 (figure 3).

As with vegetables and melons, and fruit and tree nuts, H-2A use by nursery and greenhouse employers is largely attributed to the labor-intensive nature of production within the sector. However, the use of H-2A may be less prominent within the nursery and greenhouse sector due to increasing use of mechanization by nurseries and greenhouses and/or more consistent use by these firms for workers throughout the year (Posadas, 2012). With few exceptions, H-2A workers cannot fill jobs that last more than 10 months.

The total number of H-2A workers certified in the nursery and greenhouse sector increased for most years over the last decade, apart from the 2010-11, and 2014-15 periods. The largest increase occurred between 2017 and 2018, when certified positions jumped by 6,922 (61 percent) (figure 10).

Figure 10

Nursery and greenhouse H-2A workers by employer type, 2010-19



Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

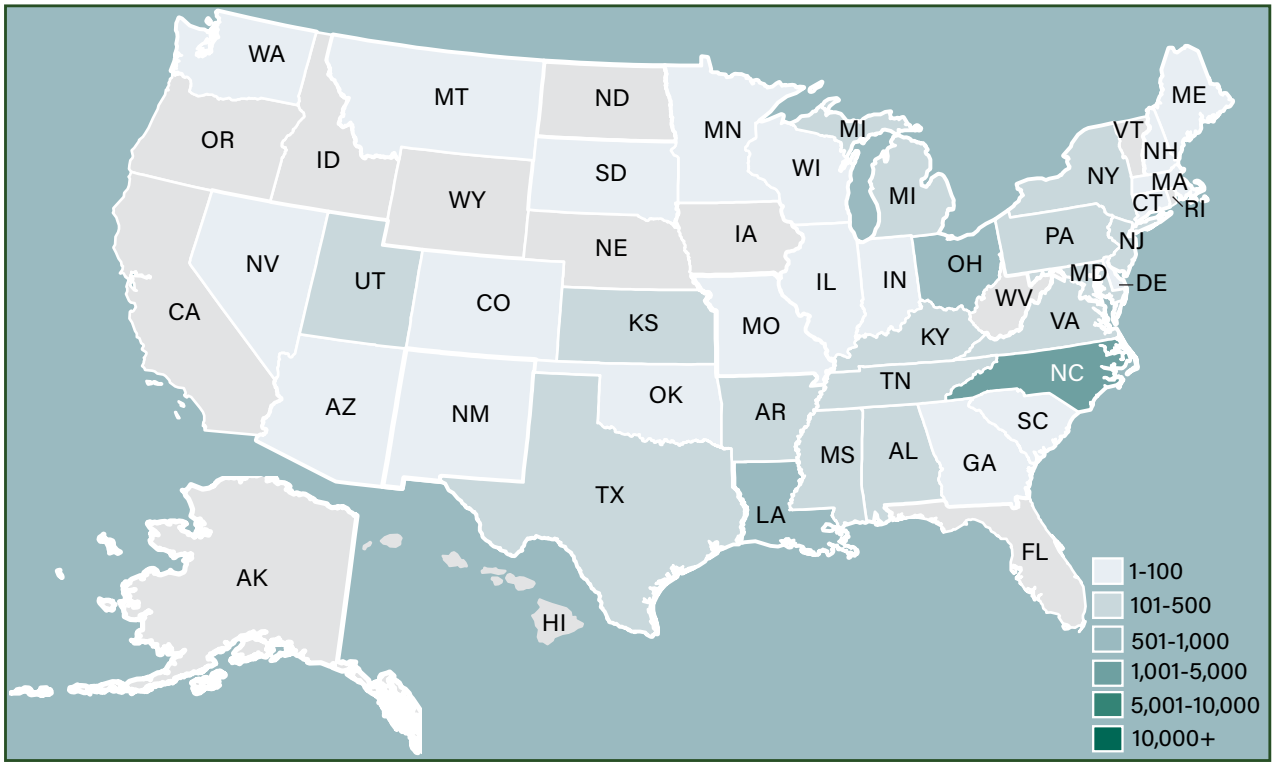
Individual firms remain the dominant employer type in the nursery and greenhouse sector, accounting for at least two-thirds of certified workers from 2010 to 2019 (figure 10). The share of positions requested by FLCs increased from 2 percent in 2010 to 15 percent in 2019. No clear trend emerges for the percentage of positions requested by growers associations during the period, as the numbers fluctuated between 2 and 26 percent of certifications.

The dominant user of H-2A workers within the greenhouse sector is the generic category "Nursery and Greenhouse Workers," accounting for almost 58 percent of the 2019 total (table 1).[31] Christmas trees are another sizeable category, with 17 percent of H-2A use in the sector. North Carolina, Kentucky, Georgia, and Tennessee comprise the top users of H-2A labor in 2019 for the nursery and greenhouse sector (figure 11). Texas, Ohio, Michigan, and Wisconsin are also significant users of the program. Florida and Kentucky show the largest growth in H-2A certified workers since 2011. Most of the growth in H-2A workers in the nursery and greenhouse sector is in the East.

[31]The lack of many specific categories within the nursery and greenhouse sector is unsurprising given the sorting mechanism explained in the Appendix. If a greenhouse were listed as growing a specific fruit or vegetable, the H-2A positions certified would be categorized with the commodity rather than by the production method.

Figure 11.1

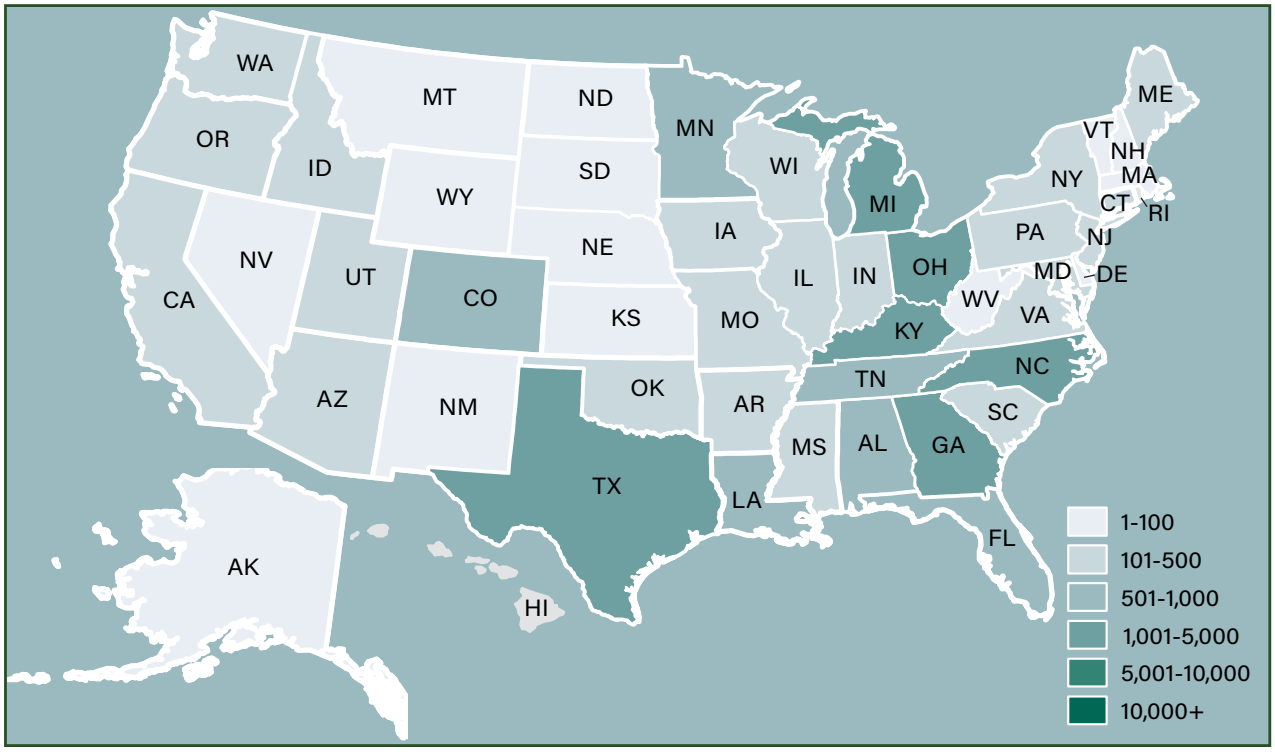
Geographic distribution of nursery and greenhouse H-2A workers, 2011



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure 11.2

Geographic distribution of nursery and greenhouse H-2A workers, 2019



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Modest Growth in H-2A Usage by Animal Products

In terms of agricultural product sales, animal products is by far the largest sector in this study. According to the COA, sales in this sector in 2017 were approximately $195 billion or 50 percent of U.S. agricultural product sales (NASS, 2019).[32] Though some industries within livestock production have high labor requirements, in most years since 2010, animal products had the lowest number of H-2A workers. Relatively low H-2A usage among employers in the sector may be because many jobs in large labor-intensive livestock industries (e.g., dairy cattle and milk production) are year-round, and are ineligible to be filled with H-2A workers (Mercier, 2014). For example, dairy farmers cannot use the H-2A program to employ milking operators as these jobs are not temporary or seasonal.

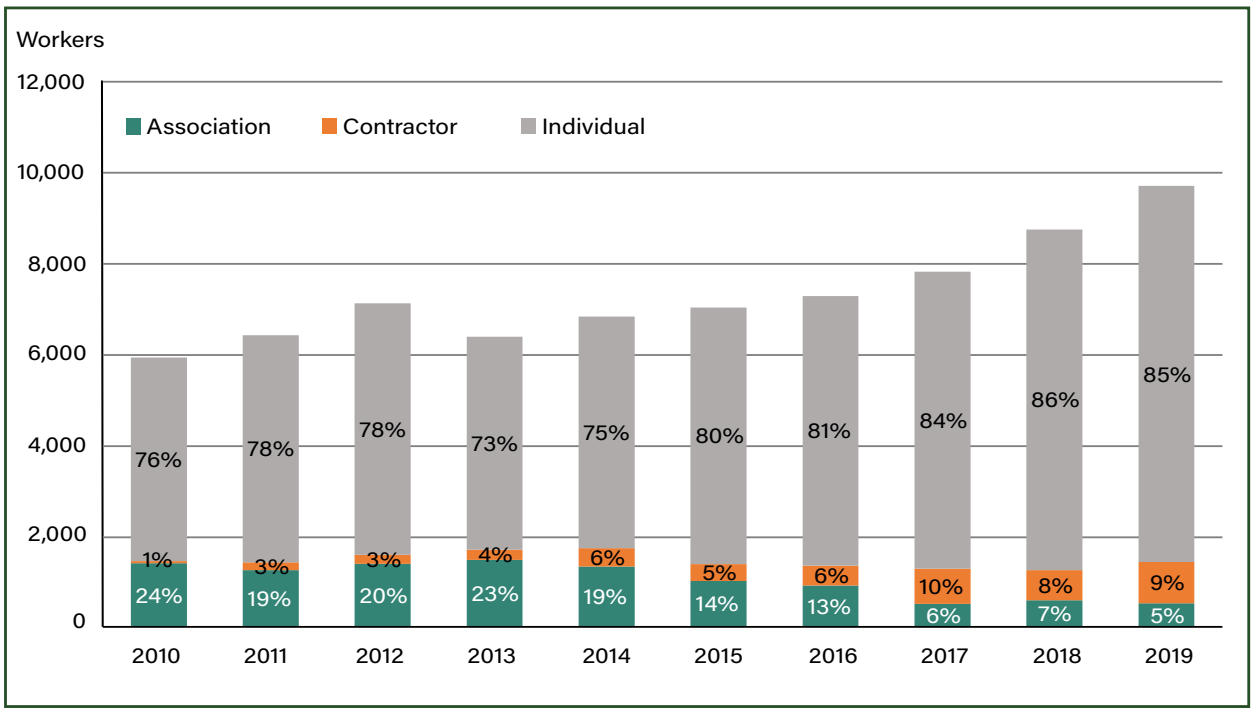
Modifications to specific H-2A rules apply to certain industries within the animal products sector. For example, the rules for employment of sheep and goat herders provide exemptions for employers from the AEWR minimum hourly wage requirement. The DOL allows H-2A contracts for sheep and goat herders to last up to 364 days, exceeding the 10-month limit that applies to other industries (U.S. Department of Labor, 2015). As a result, certifications for sheep and goat herders historically comprise a relatively large share of H-2A employment within the animal products sector. However, since June 1, 2020, USCIS no longer approves petitions for sheep and goat herders that do not conform with seasonal and temporary rules that apply to other workers (U.S. Citizenship and Immigration Services, 2019).

Animal product H-2A certifications increased during most years, reaching a record high in 2019 of 9,868 (figure 12). The only exception was 2013, where the number dropped by 744 workers from the previous year. Because of the relatively slower H-2A growth rate in the animal product sector from 2010 to 2019, its share of workers fell from a high of 8 percent in 2010 to a low of 4 percent in 2019 (figure 3).

Individual firms historically are the main users of H-2A labor in the animal products sector (figure 12). The share of H-2A certifications going to individual firms fluctuated between 73 and 86 percent. Over the same decade the number of certifications for growers associations mostly decreased from a high of 24 percent in 2010 to a low of 5 percent in 2019. The actual number of H-2A certifications for associations also generally decreased over the same period.

[32]Animal products are a wide array of goods produced from livestock such as meat, hides, milk, honey, eggs, etc.

Figure 12
Animal products sector H-2A workers by employer type, 2010-19



Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

The dominant user of H-2A within animal products is open range livestock, accounting for approximately 47 percent of certified workers within that category in 2019 (table 1). The open range livestock industry includes sheep and goats, which are heavily concentrated in the Intermountain West and Southwest, and cattle.[33] Although sheep and goat herding do not require the same levels of manual dexterity and large work crews typical in fruit harvesting, they are labor intensive industries. A worker needs to supervise the herds, typically living alongside the herd for extended periods.

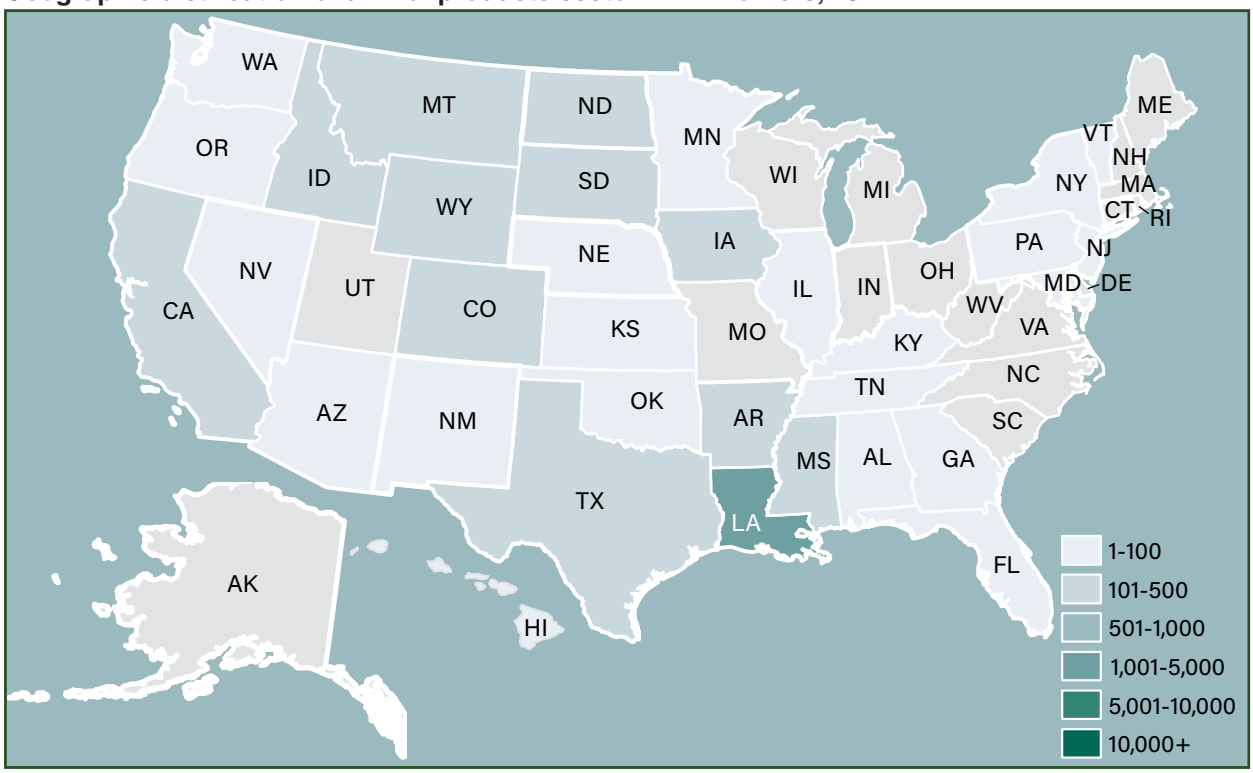
The next two industries in the animal products sector are apiculture (beekeeping) with 20 percent of certified positions, and crawfish farming with 16 percent. Relatively high H-2A use by these industries likely is because their production is much more seasonal than livestock as whole, and more labor-intensive. Within livestock industries, the aquaculture and other animal production sector, which includes apiculture and crawfish production, is by far the most labor-intensive sector. This sector has a share of total operating expenses close to 19 percent compared to beef cattle ranching and farming at just 6 percent.

Louisiana is the clear leader among H-2A labor users in 2019 for animal products with 1,718 certifications. Although Louisiana is not a traditional livestock producing State, it is the top producer of crawfish. Crawfish harvest is labor intensive, requiring workers to peel off the hard shells by hand. Texas, California, South Dakota, North Dakota, Utah, and Colorado are also top employers within this sector. California and Texas showed significant annual growth in H-2A certified workers since 2011 (figure 13). However, H-2A use in the animal products sector in Utah, which hired 1,486 workers in 2011 (second only to Louisiana in that year), dropped off significantly in 2019.

[33]A decision was made to aggregate sheep, sheep herding, open range livestock, and cattle into a single primary crop category given there is potential overlap among these industries.

Figure 13.1

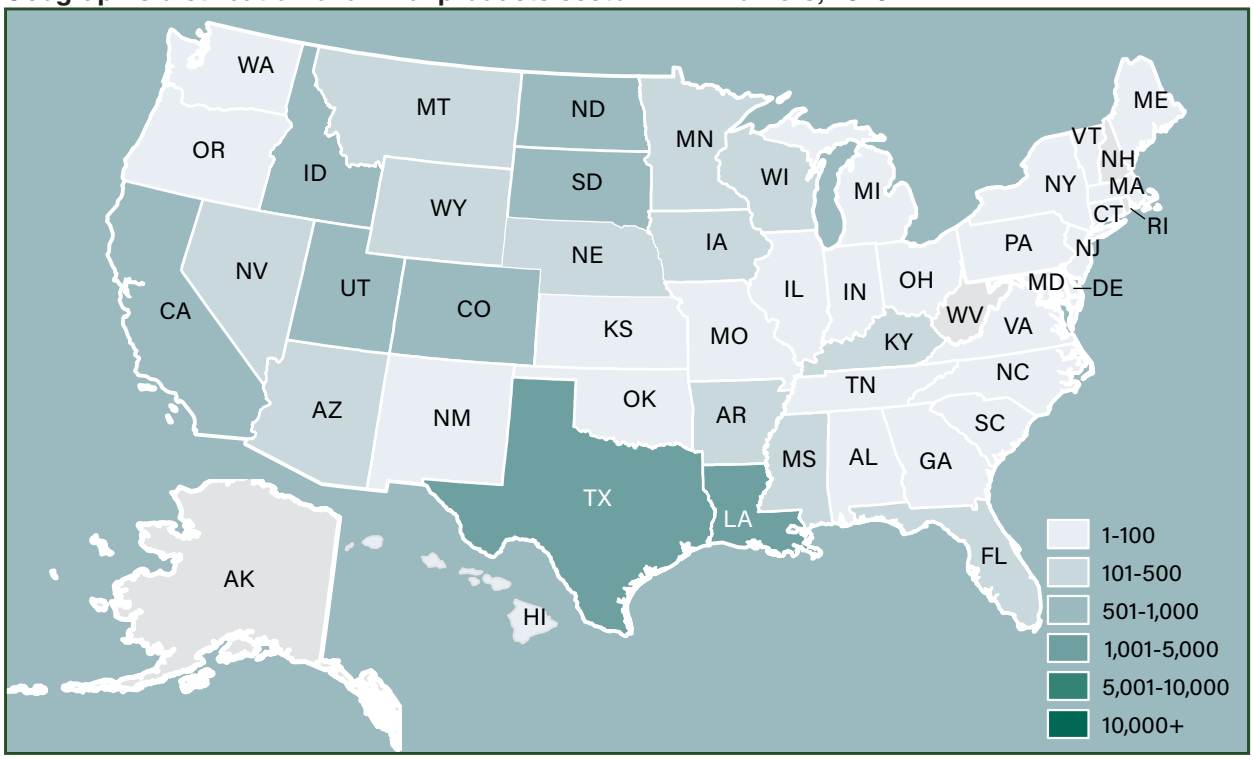
Geographic distribution of animal products sector H-2A workers, 2011



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure 13.2

Geographic distribution of animal products sector H-2A workers, 2019



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Wages, Application Size, and Contract Duration

H-2A program usage differs across sectors and over time with regards to application size and contract duration, as well as the average wages offered to workers. These trends highlight some differences in how sectors employ H-2A workers but also reveal some similarities among them.

Real H-2A Wages Increase Across Sectors

The DOL sets an annual minimum wage (AEWR) for H-2A workers in each State. This requirement is intended to prevent H-2A employment from hurting the economic opportunities of domestic farmworkers by lowering their wages. The DOL sets the AEWR for a given State as the annual weighted average hourly wage for crop and livestock workers in the previous year, as measured in the USDA's Farm Labor Survey (FLS).[34] These survey data are used to compute quarterly estimates of average hourly wage rates for 15 multi-State labor regions, and for the single-State regions of California, Florida, and Hawaii. States in the same region have the same rate (e.g., the AEWR is the same in Oregon and Washington in the Pacific Northwest region, and in Michigan, Minnesota, and Wisconsin in the Great Lakes region). Employers must pay H-2A workers whichever wage rate is higher: the AEWR, the prevailing wage or piece rate, the agreed-upon collective bargaining wage rate, or the Federal or State minimum wages.[35]

Farmworker hourly wages vary greatly across U.S. regions. In 2019, Washington and Oregon had the highest AEWR, at $15.03, with Hawaii following closely at $14.73. The AEWR was also high in Kansas, the Dakotas, and Nebraska at $14.38. The AEWR tends to be lower in the South, with Alabama, Georgia, and South Carolina having the lowest rates at $11.13 (Castillo and Simnitt, 2020).

H-2A employers must disclose the basic rate of pay associated with the positions requested in each application for certification. Many employers requesting positions that are paid by piece rate must guarantee that the worker will be paid at least the AEWR, so they report the AEWR as the basic rate of pay. Perhaps because of this, in most years in our data, most H-2A workers are offered the AEWR. In the FY 2011-19 disclosure files, 87-95 percent of applications and 95-97 percent of certifications report the AEWR as their offered wage rate. For FY 2010, however, about 57 percent of applications and 70 percent of certifications offered less than the average farmworker wage as captured in the FLS. In 2008, DOL switched from using the FLS to compute the AEWR to data on prevailing wages from the Bureau of Labor Statistics (BLS). These wages were lower than those in the FLS, leading to about $1 lower hourly wages for H-2A workers. Starting in 2010, the DOL returned to using the FLS to set the AEWR, which led to a spike in offered wages from 2010 to 2011 (U.S. Department of Labor, 2010).

Between 1990 and 2019, national FLS average wages for farmworkers increased in real terms, and relative to wages outside of agriculture. During this period, real FLS wages increased 1.1 percent per year. Since 2014, farm wages grew even faster at 2 percent per year, which is in line with evidence that farmers raise wages in response to increased difficulty in finding workers (Richards, 2018; Hertz and Zahniser, 2013; Rutledge and Taylor, 2019; Zahniser et al., 2018). Minimum wage increases, which have been shown to increase average

[34]The FLS does not sample farm labor contractors; therefore, FLS wages are only for workers hired directly by farmers. The FLS is also known as the Agricultural Labor Survey.

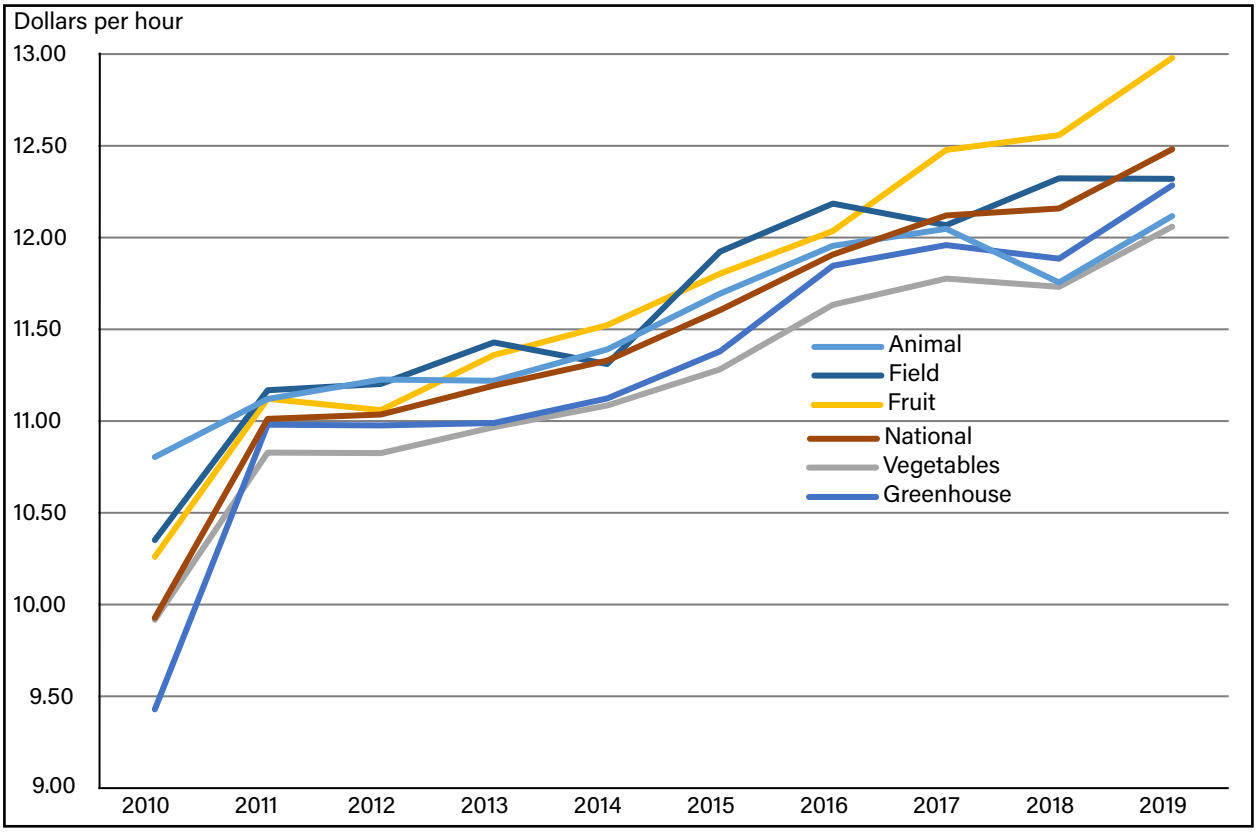
[35]In most cases, the AEWR is the effective H-2A minimum wage. In our sample period, the AEWR is always greater than the State and Federal minimum wages except for Arizona in 2018 and 2019. The AEWR is $.04 less than the State minimum wage in Arizona in 2018, and equal to it in 2019. Prevailing wages tend to be specific to individual States and commodities, and when available, are almost always lower than the AEWR. Most H-2A workers are not members of unions; however, notably, a few thousand H-2As employed by the North Carolina Growers Association (NCGA) are members of the Farm Labor Organizing Committee (Hertz, Castillo, and Zahniser, 2020; U.C. Davis, 2019). In recent years, wages offered to NCGA H-2As are almost always at the AEWR.

wages in U.S. agriculture, also may drive some of this increase (Moretti and Perloff, 2000; Buccola et al., 2012; Kandilov and Kandilov, 2019).

Figure 14 shows the real H-2A average wage (in 2019 dollars) at the national level and by sector.[36, 37] The national wage offered to H-2A workers increased 26 percent from 2010 to 2019. Since 2014, real wages increased at an average annual rate of 1.83 percent, which, unsurprisingly, tracks closely the trend in the FLS wage.[38, 39] National wage growth was highest between 2018 and 2019, with a wage increase of 2.65 percent in real terms. Wages for all sectors increased in lockstep with the national average. In the Appendix, we show that wages increased across all regions in the United States. Wages increased fastest in the Pacific region (California, Oregon, and Washington). Therefore, it appears that the growth in national wages is not driven by a single region or sector.

Figure 14

Average hourly wages of H-2A workers by sector, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

[36]Our analysis of offered wage data includes only cases in which applicants disclosed an hourly rate (97 percent of worker certifications in the disclosure files). We exclude cases where applicants disclosed wages as monthly, weekly, or as a piece rate.

[37]We calculate average wage rates as a weighted average of wages offered in each application where the weights are the number of certified positions.

[38]From 2011 to 2019, H-2A average wages fluctuated between 89 and 93 percent of the FLS average wage. H-2A wages depend greatly on regional wages reported in the FLS in the previous year and tend to be smaller because H-2A concentration is relatively high in places where the FLS regional wage is relatively low (e.g., the Southeast).

[39]The average wage offered to H-2A workers also increased relative to wages outside of agriculture from 38 to 53 percent. The nonagricultural wage is the average real wage in the nonfarm economy for private-sector nonsupervisory occupations as measured in the Current Employment Statistics Survey administered by the BLS.

The DOL sets the AEWR at the State level and with few exceptions (e.g., open range livestock) all sectors within a State face the same AEWR minimum wage requirement.[40] In figure 14 it is evident that average wages across sectors differ, however. Some sectors are more heavily concentrated in States with higher AEWRs. The wage for the fruit and tree nuts sector may be relatively high due to the concentration of fruit and tree nut production along the West Coast (Washington State and California), which have some of the highest AEWRs in the country. Moreover, although infrequently, some employers offer wages higher than the AEWR, perhaps to attract more productive workers.

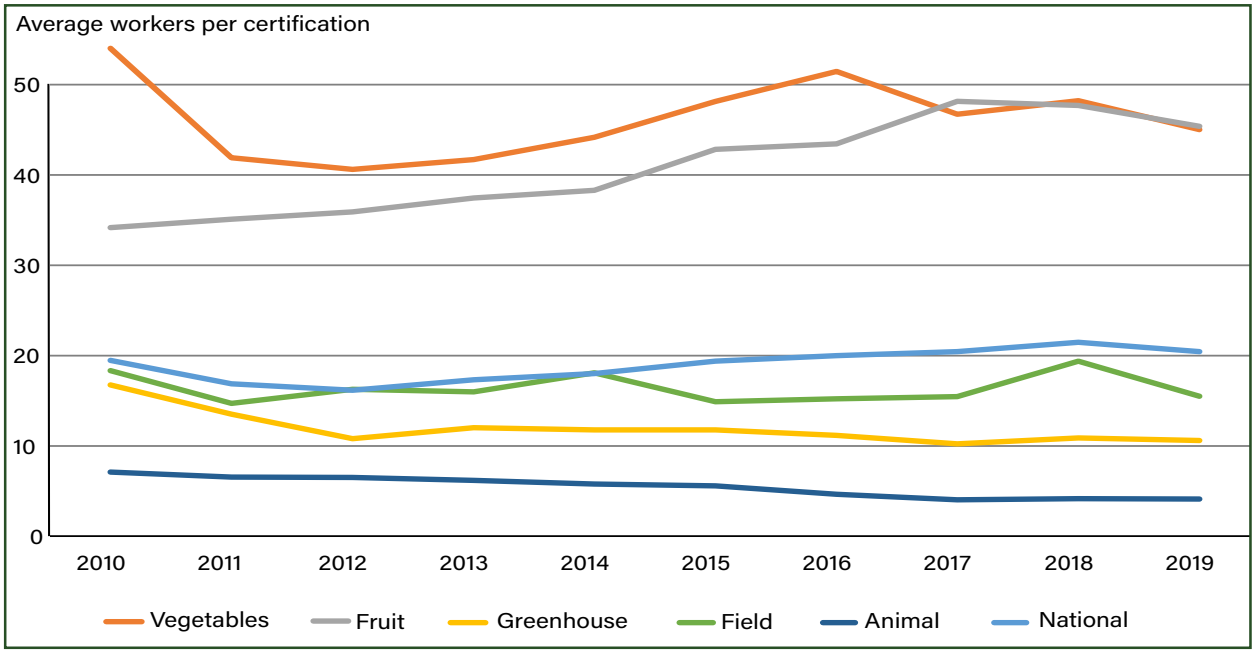
Average Size of Applications Is Largest for Vegetables and Melons

Most applications submitted by prospective H-2A employers to the DOL request the certification of multiple positions. Figure 15 presents the average number of workers requested per application between 2010 and 2019 at the national level and by sector. The national average application size increased from a low of 16 workers per application in 2012 to about 20 in 2019.

Since 2011, the average number of workers requested per H-2A application by employers in fruit and tree nuts and vegetables and melons is at least twice that of other sectors (figure 15). One explanation for this pattern is that prospective employers in these two sectors have larger labor requirements per farm.[41] Moreover, FLCs play an important role in these sectors, and they tend to provide labor to multiple producers at a time, so they employ more workers than the individual producers they service.[42, 43]

Figure 15

Average size of H-2A applications by sector, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

[40]The DOL regulations state that "for work in occupations characterized by other than a reasonably regular workday or workweek, such as the range production of sheep or other livestock, the OFLC Administrator has the authority to establish monthly, weekly, or semi-monthly adverse effect wage rates (AEWR) for those occupations for a statewide or other geographical area."

[41]Using estimates of the number of employers, for individual employers, the average number of workers requested is largest in fruit and tree nuts and vegetables and melons. This helps explain why in 2019 although fruit and tree nuts and vegetables and melons account for about two-thirds of all workers, these sectors only account for around one-fourth of individual employers.

[42]FLCs may also try to minimize costs in the application process, so it is reasonable that they include as many workers as possible on a single application.

[43]We are unable to determine how many producers are serviced by a given FLC since this information was not reported in DOL disclosure data for 2010-2019.

For the fruit and tree nuts sector, the average application size steadily increased from 34 workers per application in 2010 to 48 in 2017 and decreased slightly to 45 in 2019. In the Appendix we show figures for average size by employer type. Application size for fruits is mostly stable over the period across employer types but average application size for FLCs is about three times as large as that for individual employers. Therefore, as the FLC share in the sector increases, so does the average application size. Given that fruit and tree nuts comprise such a large portion of workers requested, it is unsurprising that the national average size of applications increased during the period.

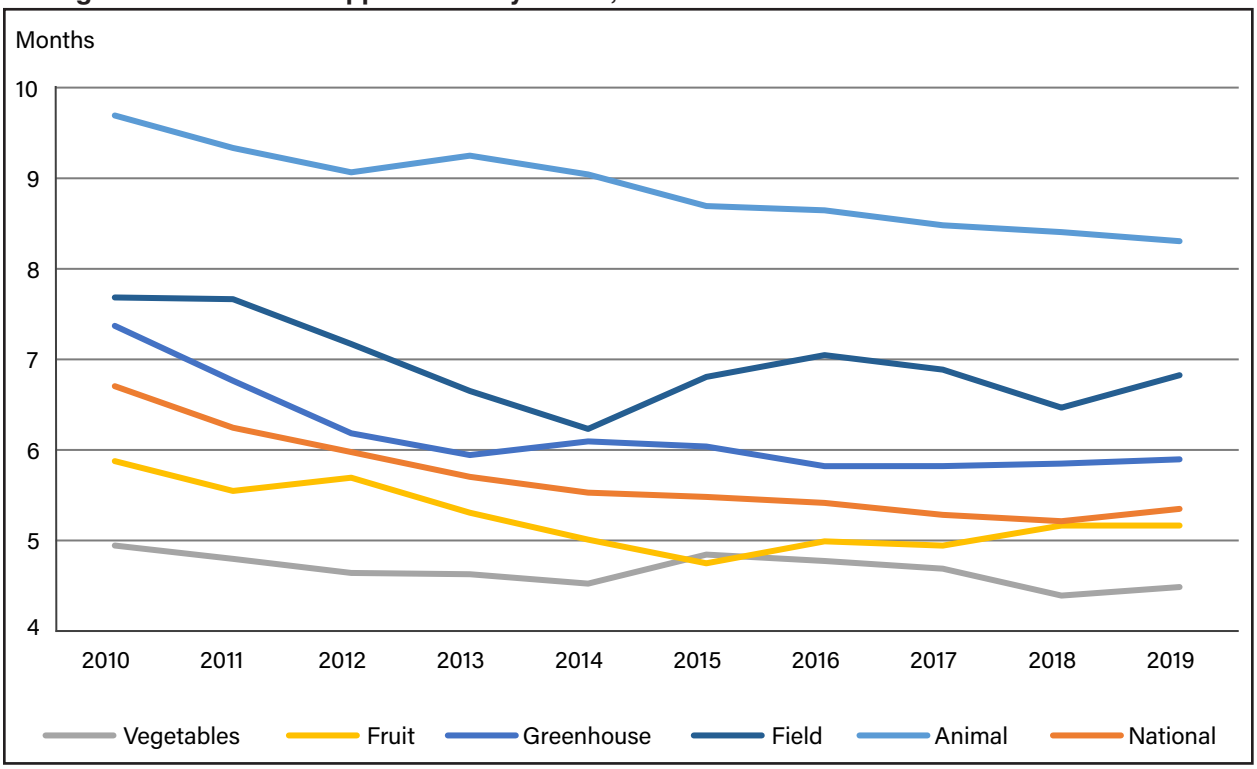
For vegetables and melons, field crops, and the nursery and greenhouse sectors, the average number of workers per application does not follow a clear trend. For vegetables and melons, it falls from an initial high of 54 workers per application in 2010 to a low of 40 workers per application in 2012 and fluctuated throughout the remainder of the decade. For field crops, average size fluctuated between 14 and 19 workers, and for nursery and greenhouse, between 11 and 17.

In contrast to other sectors, animal products follows a clear downward trend in the average number of workers per application. This average starts at 7 in 2010 and ends at 4 in 2019. This decline may reflect an increase in the share of certifications for individual employers relative to that of growers associations. The number of workers requested per application is likely to remain relatively constant for individual employers, assuming the average firm size also remains constant. Applications filed by associations are likely to include more workers per application, as these may include workers destined for more than one producer, as is the case with applications filed by farm labor contractors.

Average Contract Length Declines for All Sectors

The overall trend is toward shorter contract durations. The average contract length in 2010 for all sectors combined was 6.7 months, after which it steadily decreased to 5.2 months by 2018, before increasing slightly to 5.3 months in 2019. Contract length decreased most prominently for the nursery and greenhouse sector (from 7.4 to 5.8 months) and the animal products sector (from 9.7 to 8.3 months) (figure 16). Average contract length in the animal product sector is substantially higher than for any other sector. This is likely because employment is less seasonal in livestock than in crops, and because special rules governing the employment of sheep and goat herders permitted contract lengths to exceed 10 months.

Figure 16
Average duration of H-2A applications by sector, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Conclusions

This study describes trends in H-2A program usage by agricultural sector, region, and firm type over the 2010-19 period. H-2A certifications increased by more than 200 percent from 2010 to 2019. H-2A growth was especially pronounced in fruit and tree nuts, and vegetables and melons, likely reflecting the size, labor intensity, and seasonality of employment in these sectors. Increases in H-2A also occurred in other labor-intensive sectors (nursery and greenhouse), and within specific industries (tobacco, seed corn, crawfish, and open range livestock). At the sector level, H-2A employment increases were much lower in the animal products sector than in fruit and tree nuts, and vegetables and melons. Although the animal products sector includes large labor-intensive industries such as dairy cattle and milk production, jobs in such industries tend to be year-round and do not qualify for H-2A employment.

H-2A use by FLCs expanded dramatically from 2010 to 2019 with the contractor share of H-2A employment increasing from 15 to 42 percent. Increases in FLC shares were more pronounced in fruit and tree nuts, and vegetables and melons, which combined accounted for about 60 percent of all contract labor expenditures in the United States in 2017.

One explanation for the notable increase in the FLC share of H-2A employment is that areas with strong FLC presence, such as California and the Southwest, may have experienced larger relative declines in labor supply. It may also be the case that demand shocks for the commodities produced in these FLC-reliant regions were stronger than in others. Yet another plausible explanation is that FLCs face lower costs of hiring H-2As than individual employers; therefore, it is cheaper for individual employers to hire H-2A through FLCs than to hired them directly. Hiring H-2A workers tends to be more expensive than hiring locally because employers must pay for application and recruitment fees, the AEWR, travel, and housing costs. These costs are likely prohibitive to many small producers seeking workers for short-term contracts. Because FLCs tend to serve many producers, they may be able to effectively share many of the costs associated with hiring H-2A workers among their customers.

Although employers incur additional expenses when hiring H-2A workers, these costs may be justifiable when enough qualified domestic workers cannot be found. If an employer must choose between foregoing a portion or all the harvest (due to a domestic labor shortage) or paying more for H-2A workers, the latter is frequently the better option. Given these higher costs, the rapid expansion of the H-2A program in the last decade may in part be a response to the tightening of U.S. farm labor markets. H-2A wages and employment increased across all sectors and regions, which is consistent with a widespread decline in labor supply. However, other factors may also contribute to H-2A uptake. For example, some growth in H-2A may be in response to increased demand for certain labor-intensive commodities (e.g., fresh fruit) (Minor and Perez, 2018). Examining the relative importance of these and other factors to explain overall H-2A growth is beyond the scope of this study. Future research may address this challenge.

Future research also may examine factors that drive the differences in H-2A uptake across regions and firm types. Although H-2A employment is rising in nearly every State, growth across States is not proportional to their size of the overall agricultural labor force. Do differences in the severity of labor supply shocks across regions drive this trend? If so, do supply shock differences stem from regional differences in migration networks, competition for workers from non-agricultural industries, or intensity of enforcement of immigration laws? Do regional differences in the cost of accessing the H-2A program play a role? If so, do they stem from differences in network effects among growers or access to filing intermediaries that teach growers how to navigate the program? Moreover, do FLCs face lower H-2A costs per worker than individual growers? If so, do differences across regions in their historical exposure to FLCs drive some of the differences in H-2A uptake?

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Appendix

A Brief History of Agricultural Guest Worker Programs

Agricultural guest worker programs in the United States date back more than 100 years. The first guest worker program started during World War I, as a response to labor shortages triggered by men who left the agricultural sector for military service and higher paying industrial jobs, and the curtailment of Mexican immigration by the Immigration Act (1917) (Congressional Research Service, 1980, p. 6). Beginning in 1917, the United States established a unilateral labor program with Mexico allowing the entry of Mexican nationals to fill temporary jobs. Most laborers worked directly in seasonal agricultural jobs. Subsequent generations refer to this World War I era program as "the first bracero program" (Briggs, 2004). During the life of the program (1917-1921) an estimated 80,000 Mexican workers participated (Congressional Research Service, 1980, p. 5). The program was criticized for a relatively high desertion rate (perhaps 36 percent), because Mexican nationals stayed beyond their contracts without legal authorization. The Mexican government criticized the first Bracero Program due to a relative lack of protections for their citizens (Scruggs, 1960).

During World War II farm workers found jobs in the defense industries, reducing the available agricultural workforce. In response, the Federal government resurrected the Bracero Program, establishing a series of bilateral agreements with Mexico (Congressional Research Service, 1980). After the war ended (1945) the Bracero Program was extended, due to continued labor shortages in the American Southwest and other labor shortages caused by the Korean War. The program lasted more than two decades, ending in 1964 due to opposition from labor advocacy and social welfare groups and increased mechanization in the cotton industry (Congressional Research Service, 1980; Griffith, 1986). Throughout its life (1942-1964), the program employed an estimated 4 million to 5 million Mexican agricultural workers (Congressional Research Service, 1980, p. 15).

A much smaller British West Indies foreign labor program existed alongside the Bracero Program from 1943 to 1951 (Griffith, 1986). This program was absorbed into the H-2 program when the Immigration and Nationality Act (1952) established the H-2 visa class for temporary unskilled workers (Vialet, 1978). The Immigration Reform and Control Act of 1986 (IRCA) effectively split the H-2 visa into two separate categories with H-2A visas designated for agricultural workers (Onel and Farnsworth, 2016). Most H-2A workers today come from Mexico (92 percent in 2019); however, workers from a wide range of countries receive H-2A visas. In 2019 individuals from 51 nations other than Mexico received H-2A visas, with the largest contingencies from Jamaica (5,030), South Africa (4,816), Guatemala (2,537), and Peru (974). H-2A program rules and regulations were updated periodically during its more than 30-year history to benefit both workers and growers. From time to time, legislation is proposed to make significant changes to the H-2A program and or replace it with a different program altogether. Recent examples include the Agricultural Job Opportunities, Benefits, and Security Act (2003), the Border Security, Economic Opportunity, and Immigration Modernization Act (2013), The Agricultural Guest Worker Act (2017), and the Farm Workforce Modernization Act (2019). Whether the Farm Worker Modernization Act will gain enough support to become law is yet to be seen.

Classifying H-2A Petitions by Sector

The H-2A case disclosure files used in this report contain a wealth of information on employers who use the program. As the program evolved, so did the scope and quality of the data reported each fiscal year. Table A-1 shows a partial list of variables included in the dataset. The number of variables available mostly increases each year, and the data quality improves over time. Unfortunately, this is not the case for data on the primary commodity produced by the H-2A workers, which are the best data available to classify petitions by sector.

Table A-1
Key variables reported, by year

Key variable reported	Fiscal year									
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Beginning date	X	X	X	X	X	X	X	X	X	X
Ending date	X	X	X	X	X	X	X	X	X	X
Number of certified workers	X	X	X	X	X	X	X	X	X	X
Number of hours		X	X	X	X	X	X	X	X	X
Rate of pay	X	X	X	X	X	X	X	X	X	X
Unit of pay	X	X	X	X	X	X	X	X	X	X
Worksite State	X	X	X	X	X	X	X	X	X	X
Organization type: farmer, labor contractor, or association				X	X	X	X	X	X	X
Primary crop		X	X			X	X	X	X	X
Employer name	X	X	X	X	X	X	X	X	X	X
Employer address (w/postal code)	X	X	X	X	X	X	X	X	X	X
Job title	X	X	X	X	X	X	X	X	X	X
Standard Occupation Classification (SOC)					X	X	X	X	X	X
North American Industry Classification (NAICS)								X	X	X

Note: "X" indicates this variable was collected and reported in that particular year by the U.S. Department of Labor.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Our approach to categorizing petitions by sector is guided by three limitations on the primary crop data at our disposal. First, crop descriptions are missing altogether for FYs 2010, 2013, and 2014, and for about 12 percent of petitions in 2015. Second, the quality of the 2015 crop data is poor. The data includes no standardized responses to job title and crop questions in the labor certification form; therefore, applicants submit a wide range of responses to these questions. For 2011-12 and 2016-19, the OFLC processes crop responses with fairly standardized variable codes, comparable within and across years. For 2015, however, the data were coded as the applicants reported them. As a result, more than 2,000 unique crop codes exist for 2015. These codes contain many misspellings and variations for the same crop, and in many cases, several crops, implying OFLC entered all crops reported, not just the primary crop. Third, some petitions cannot be classified by sector using the primary crop variable because entries consist of an occupational description that does not reference the underlying crop (e.g., "general farmworker, agricultural equipment operator," etc.).

For the years with high-quality commodity data available, we use commodity names to map primary crop entries to sectors. We then use the job title and NAICS descriptions to categorize applications without an explicit crop reference. Lastly, we match firms over time to account for years without commodity data. See section below for more detail.

A. Categorizing petitions using primary crops and job titles — fiscal years 2011-12 and 2016-19

The COA's questionnaire generated a list of commodity names and the major sector they map to. See table A-2 for the list.

Table A-2
Matching terms for crop sector categories

Category/Subcategory	Matching terms
Fruit and nuts	
Berries	berries, berry, cherry
Citrus	citrus, lemon, navel, orange, tangerine, Valencia
Non-Citrus	apple, apricot, avocado, cider, fruit, grape, nectarine, orchard, olives, peach, pear, plum, prunes, vineyards
Nuts	almonds, nuts, pecan, walnut
Vegetables and melons	
Melon	cantaloupe, cantaloupes, melon
Leafy	arugula, bok choy, Brussel, Brussels sprouts, cabbage, cilantro, greens, herb, kale, lettuce, oregano, parsley, romaine, spinach, spring mix, watercress
Root	beet, potato, radish
Vegetable	artichoke, asparagus, broccoli, carrot, cauliflower, celery, cucumber, eggplant, garlic, ginseng, okra, onion, peas, pepper, pickle, pumpkin, squash, sweet corn, tomatillos, tomato, turnip, vegetable, zucchini
Animal products	
Beef	cattle, livestock
Dairy	dairy
Pork	pigs
Poultry	chicken, poultry, turkey
Other	alligators, alpaca, bees, crickets, deer, elk, fish, game animal, game birds, goats, honey, horses, minks, oysters, pheasant, sheep, turtles
Field crops	
Grains and beans	barley, beans, coffee, corn, grains, hops, legumes, oats, peanuts, rice, spelt wheat
Hay and straw	alfalfa, grass, hay, straw
Oilseeds	canola, cotton, flax, oilseed
Sugars	milo, sorghum, sugar beets, sugar cane
Tobacco	air cured, burley, flue cured, tobacco
Nursery and greenhouse	Christmas, flowers, hemp, logging, mushrooms, nursery and greenhouse workers, pine straw, plants, silage, sod, trees, turf

Source: USDA, Economic Research Service using data from the 2017 Census of Agriculture.

For all years for which crop data are available (except for 2015), we assigned a petition to a sector if the primary crop description for that petition contains the commodity name associated with that sector. The descriptions in unmatched petitions helped further refine the commodity list (e.g., the list includes commodity names not originally included, spelling variations, typos, etc.). The remaining unmatched petitions that cannot be classified to a sector based on commodity description form the "other" category. This category contains entries with information on occupations, but not on commodities (e.g., general farm worker, agricultural equipment operators, drivers, or construction of livestock buildings).

We further classify "other" petitions based on the job title description. Unlike primary crop descriptions, job titles are never standardized, and usually contain only occupational information. However, in many cases job titles contain information on the crop produced. We compare the commodity name list to the job title description. If we categorized the petition to the "other" sector, we recode it to associate the sector with the

job title. To avoid mismatches, we consider only job titles for which the entry contains the name of a single crop.

B. Fiscal years 2010 and 2013-15 — firm matching

We assign a sector to petitions submitted by a firm in 2010 and 2013-15, based on its reported crop for the years for which we have information. We first create a list containing names and zip codes of unique employers in 2011, 2012, and 2016. We then merge this list with records in 2010 and 2013-15 by employer name using a probabilistic record matching technique. This "fuzzy matching" technique accounts for differences in the recorded names of employers across years. To improve the quality of matches, we restrict the procedure to firms located in the same zip code. Also, we standardize words frequently found in employer names such as business type identifiers (e.g., we change "corporation" to "corp."), and numbers ("one" to "1"). The next step is to use the job title variable to categorize entries in the "other" category.

Table A-3 summarizes the success in matching firms across years and in assigning sectors to petitions. Given that many H-2A employers are repeat users, most records match. The petitions that we exactly match account for 80-90 percent of workers (i.e., names and zip codes match exactly). Accounting for name spelling variations, these numbers increase to 88-94 percent. In applying the job title description for classification, the share of workers assigned to a sector category increases to 92-96 percent.

Table A-3
Matching firms across years and sectors

Fiscal year by percentage					
		2010	2013	2014	2015
Workers	Matched to exact	79.5	87.3	87.4	90.7
	Matched to fuzzy	8.3	5.1	4.4	3.0
	Matched to total	87.8	92.4	91.8	93.7
	Job title assigned by crop	4.2	3.5	3.8	1.4
	Assigned to a crop category	91.9	95.9	95.6	95.1
Applications	Matched to exact	67.3	83.0	84.6	85.9
	Matched to fuzzy	14.1	6.9	6.0	5.3
	Matched to total	81.3	90.0	90.6	91.2
	Job title assigned crop	5.0	4.0	3.4	2.9
	Assigned to a crop category	86.4	94.0	94.0	94.1

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

C. Categorizing petitions using NAICS codes

As a last step, we categorize petitions in the "other" sector using NAICS industries as follows. First, for the years with NAICS information available, (2017-19), if a petition is classified as "other," we assign it to field crops if the employer is in the Oilseed and Grain (NAICS 1111) and Other Crop Farming (NAICS 1118); to vegetables and melons if in the Vegetable and Melon Farming (1112) industry; to fruit and tree nuts if in Fruit and Tree Nut Farming (NAICS 1113) industry; to nursery and greenhouse if in the Greenhouse, Nursery, and Floriculture Production (NAICS 1114) industry; and to animal products if in the Animal Production and Aquaculture (NAICS 112) industry. We do not categorize "other" petitions that belong to farm labor contractors, since the NAICS code–Support Activities for Crop Production (NAICS 1151)–does not contain information on commodities.

Second, we follow a similar fuzzy matching technique to bring firm-level NAICS information from 2017-19 to previous years (2010-16). Having matched firms over time, we classify petitions in the "other" category using NAICS codes.

Lastly, we distribute across sectors the small share of petitions that are either not mapped to any sector (in 2010, 2013-15) or that are classified as "other." We distribute petition based on their shares of matched petitions in one of our five sectors (i.e., if 20 percent of matched petitions are in fruit and tree nuts, we assign 20 percent of unclassified/other petitions to fruit and tree nuts). We assign petitions classified as other "other" to the five sectors for ease of exposition. Qualitatively, none of the tendencies in sectoral H-2A uptake are affected by this choice. The table below shows the sectoral distribution of petitions over time, including the "other" category.

D. Categorizing farm labor contractors — 2010-19

From 2013 to 2019, the OFLC data contain a variable called "organization flag," that names the type of entity that sponsored the petition (Individual Employer, an H-2A Labor Contractor or Job Contractor, or an Association–Joint or Sole Employer) or whether the petition was filed on behalf of an employer by a growers association.

Therefore, for most petitions, we know whether the sponsoring H-2A employer is an Individual Employer, an H-2A Labor Contractor or Job Contractor or an Association (Joint or Sole Employer). For the smaller set of petitions filed by associations on behalf of the employer, we don't know whether the sponsor is an Individual Employer or a FLC.

To assign a sponsor type to unclassified petitions in the data (all petitions before 2013, and some petitions thereafter), we used the following approach:

1. Use known farm labor contractor lists and ID FLCs by employer name, from the following lists:

    a. FLCs listed in the H-2A dataset from 2013 to 2019.

    b. FLC lists from the DOL for 2010, 2017, and 2019, the only three years available.

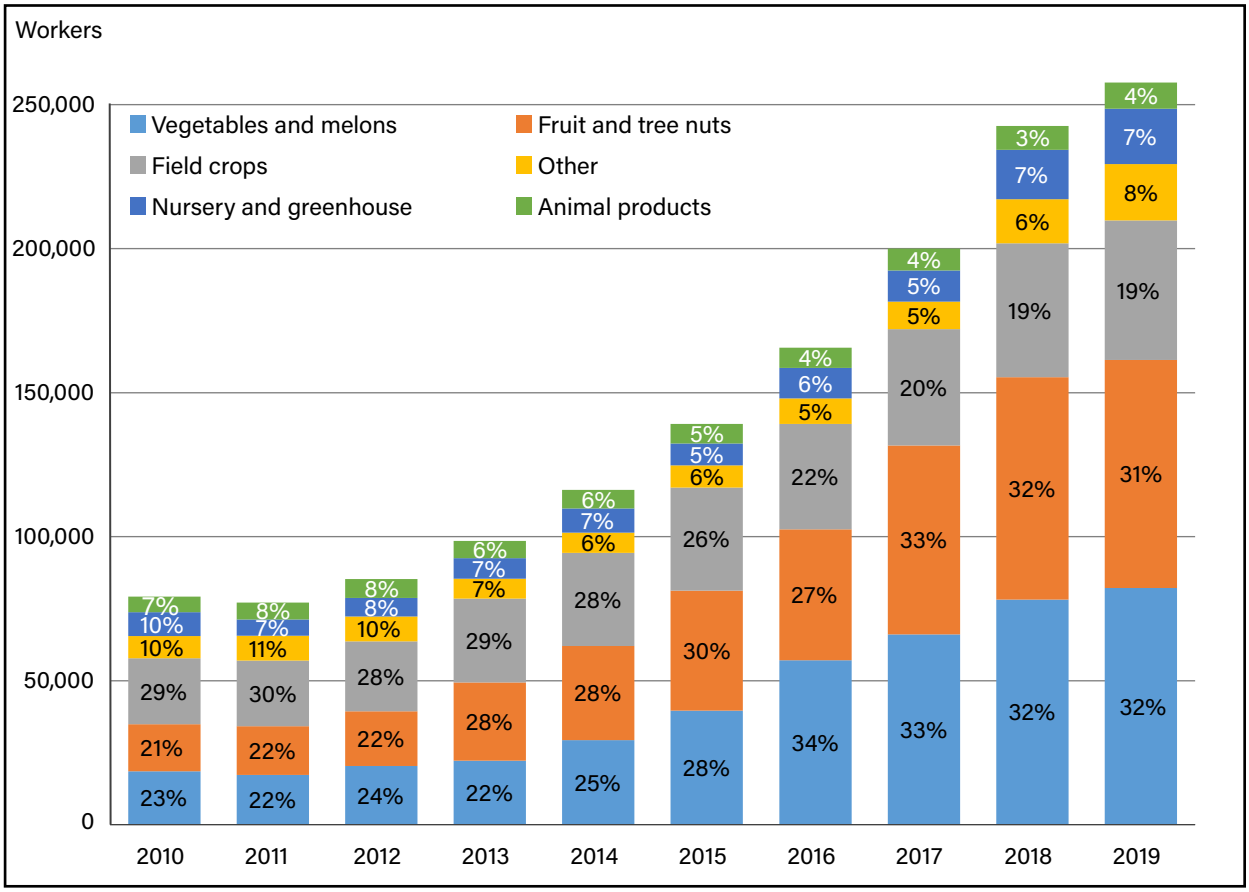
2. Develop keyword-based criteria to categorize FLCs based on employer name. A petition is potentially filed by an FLC if its employer name:

    a. Contains words that are common in FLC names (e.g., "Harvesting," "Labor," "Contractor") but that are not common in names of farms (e.g., "Farm," "Ranch," "Family," "Orchard"). We determine keywords by splitting employer names into individual words and counting these words.

    b. Consists solely of a personal name with a Hispanic last name.

Appendix Figures

Figure A-1
Total H-2A positions certified by sector including "other"

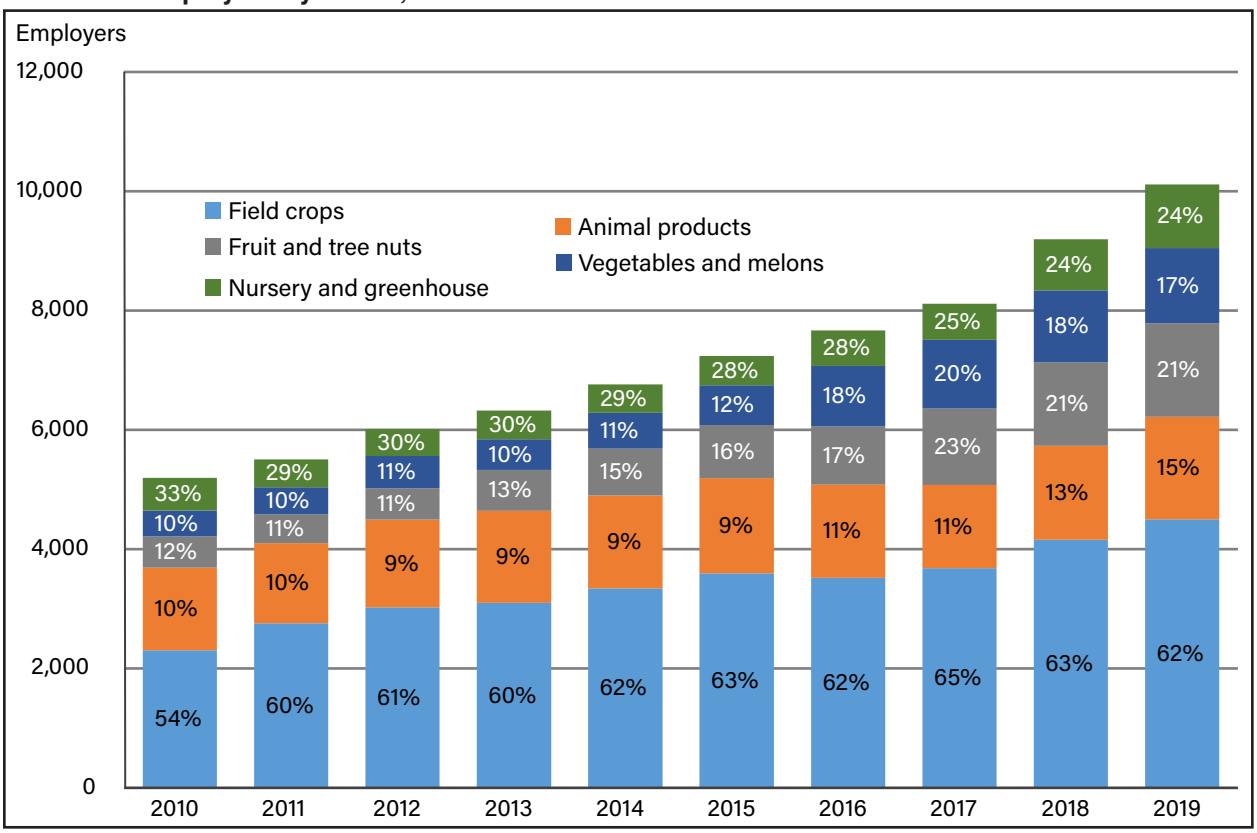


Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-2

Number of employers by sector, 2010-19

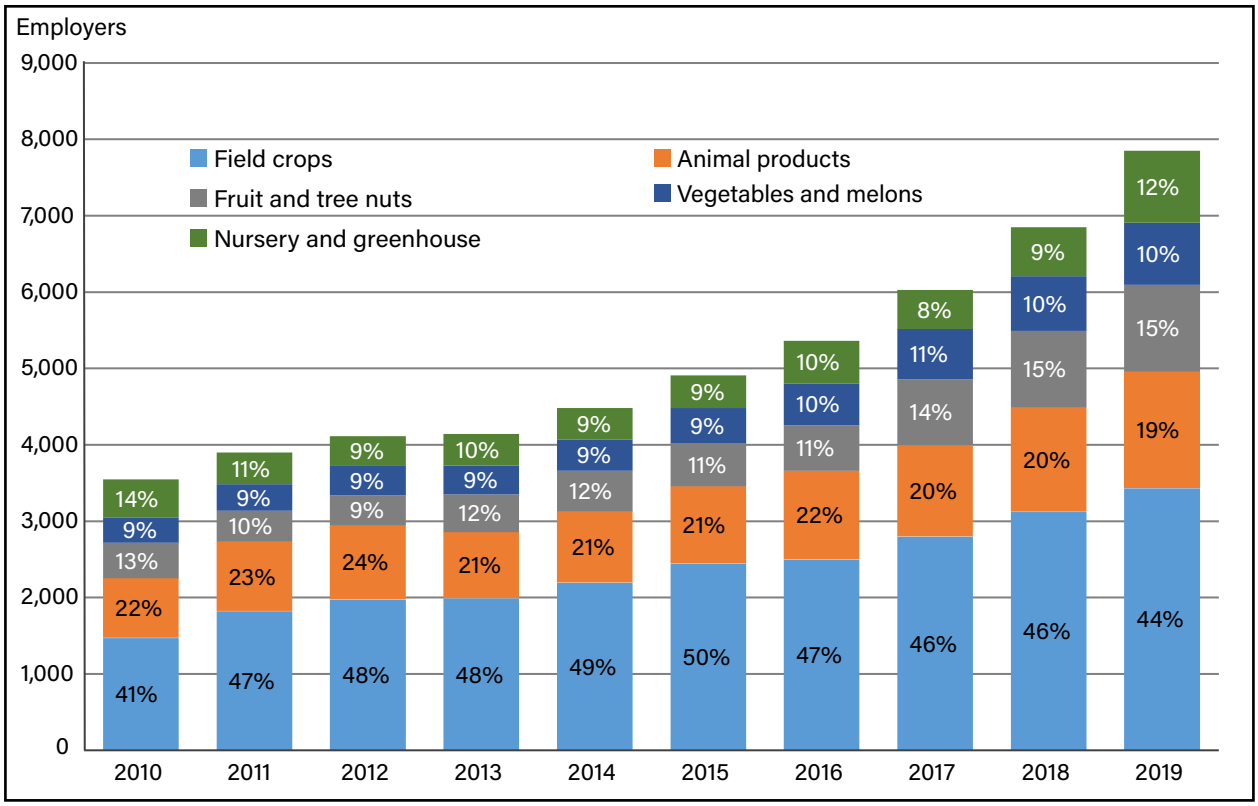


Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-3

Number of individual employers by sector, 2010-19

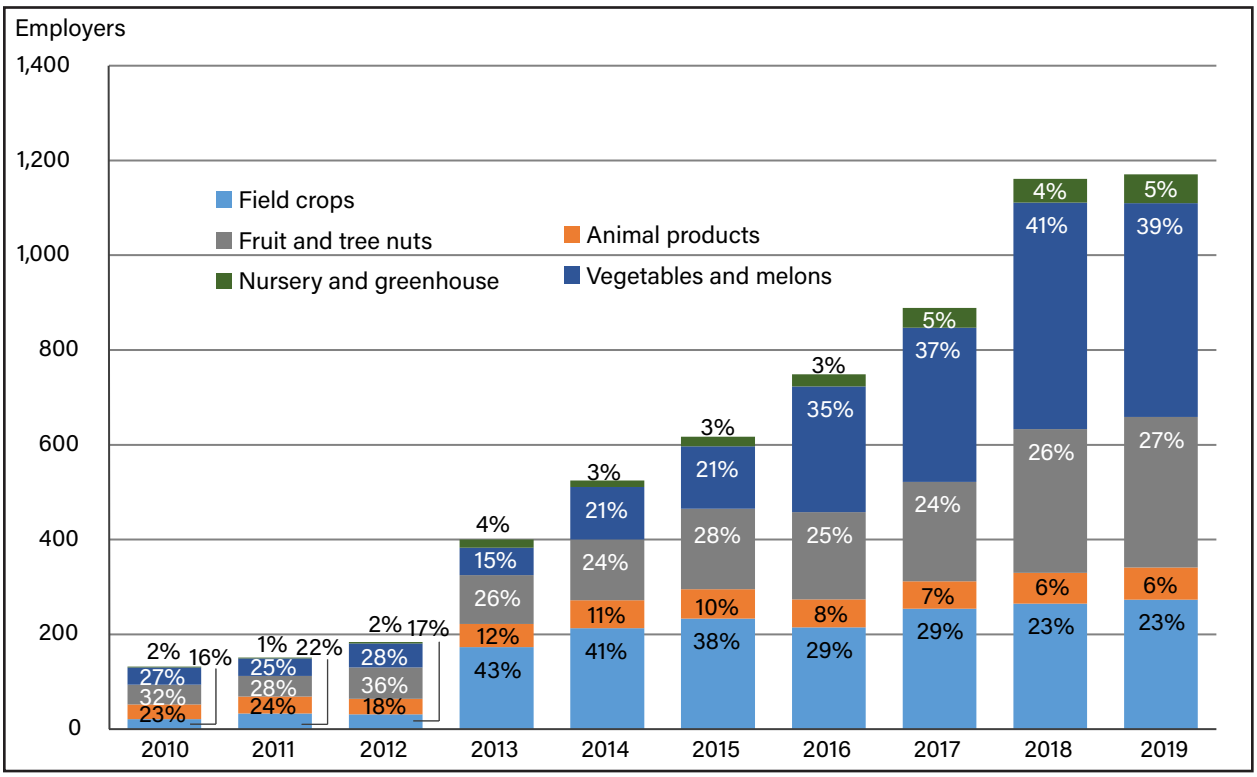


Note: Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-4

Number of FLC employers by sector, 2010-19

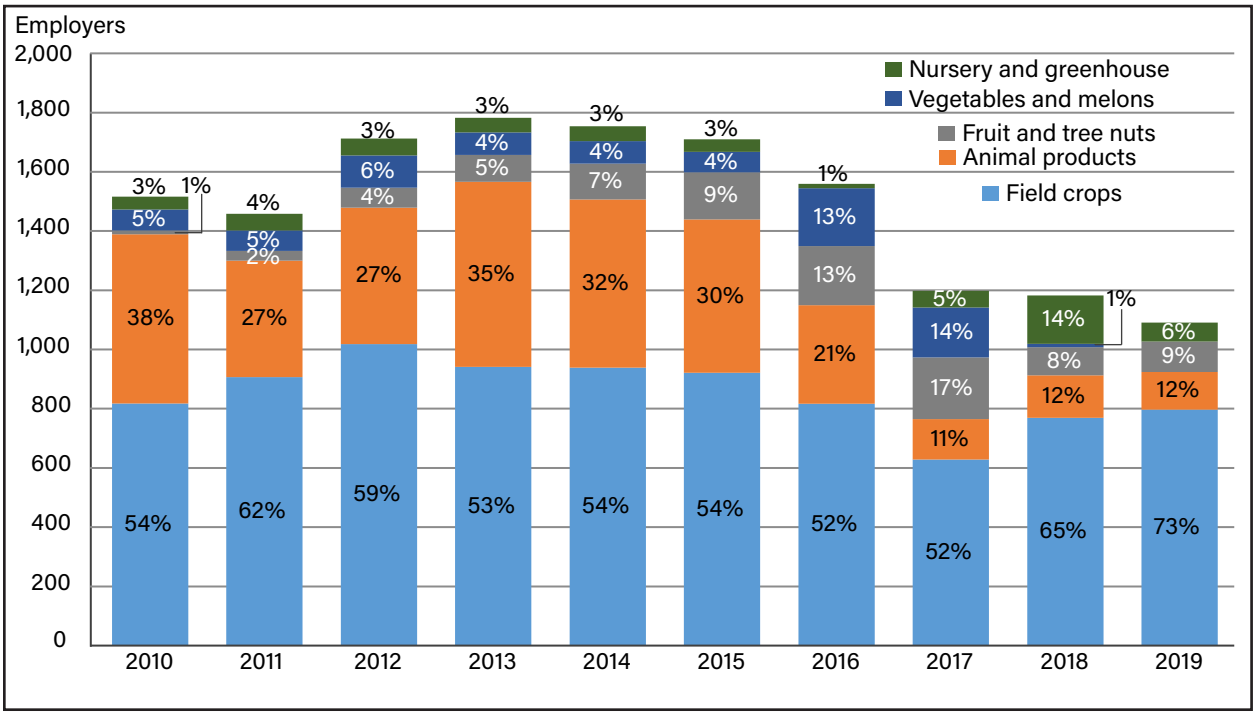


Note: Each worksite served by an FLC is counted as a separate employer.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-5

Number of growers association employers by sector, 2010-19

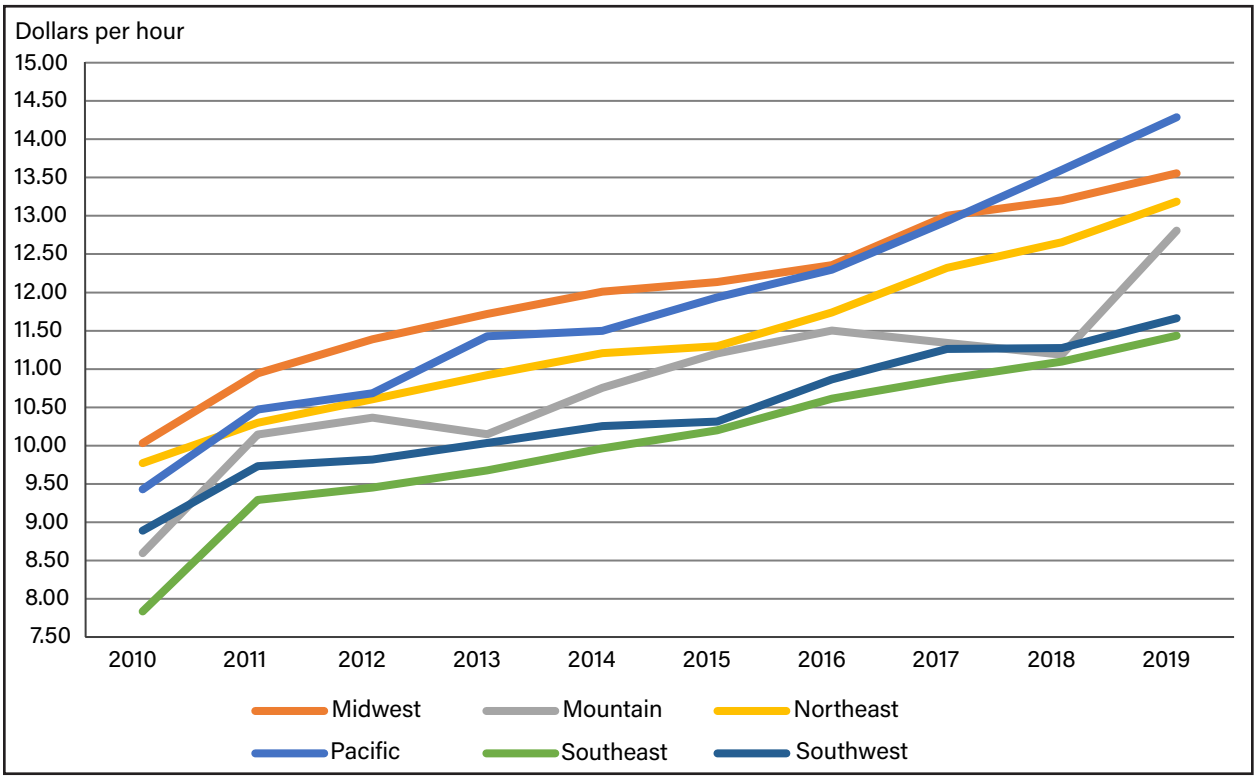


Note: Includes all employers listed in the H-2A application for joint employment (i.e., counts employers noted in the "sub" employer records). Percentages may not add to 100 due to rounding.

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-6

Average hourly wages of H-2A workers by region, 2010-19

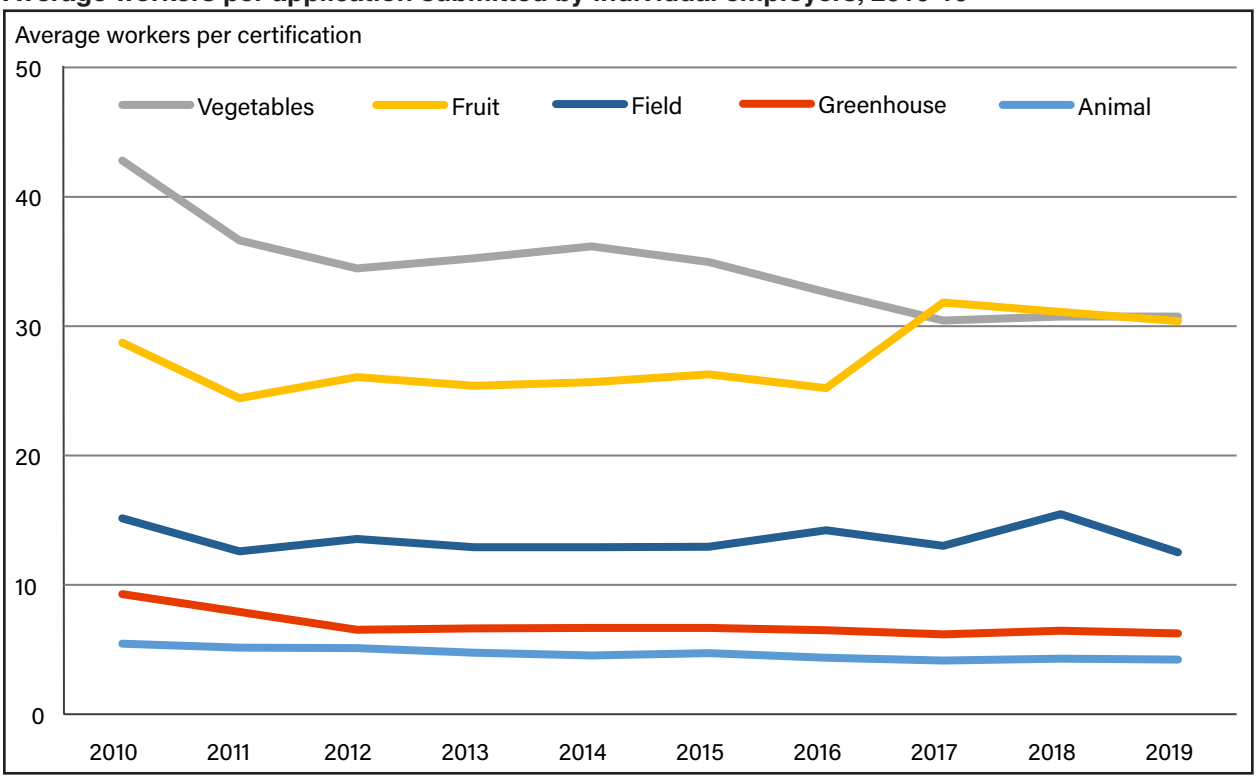


Midwest: IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI
Mountain: CO, ID, MT, NV, UT, WY
Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT
Pacific: CA, OR, WA
Southeast: AL, AR, DE, GA, FL, LA, KY, MD, MS, NC, TN, VA, WV
Southwest: AZ, OK, NM, TX

Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-7

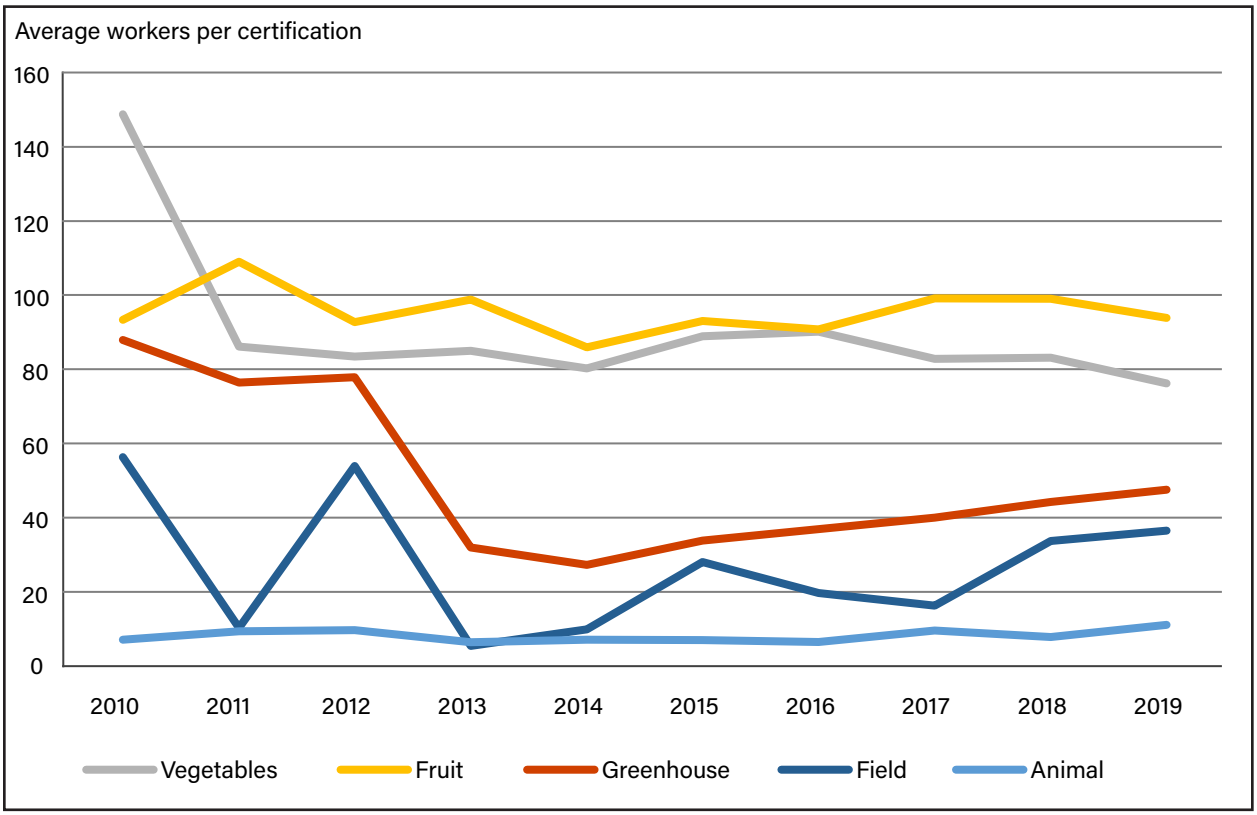
Average workers per application submitted by individual employers, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-8

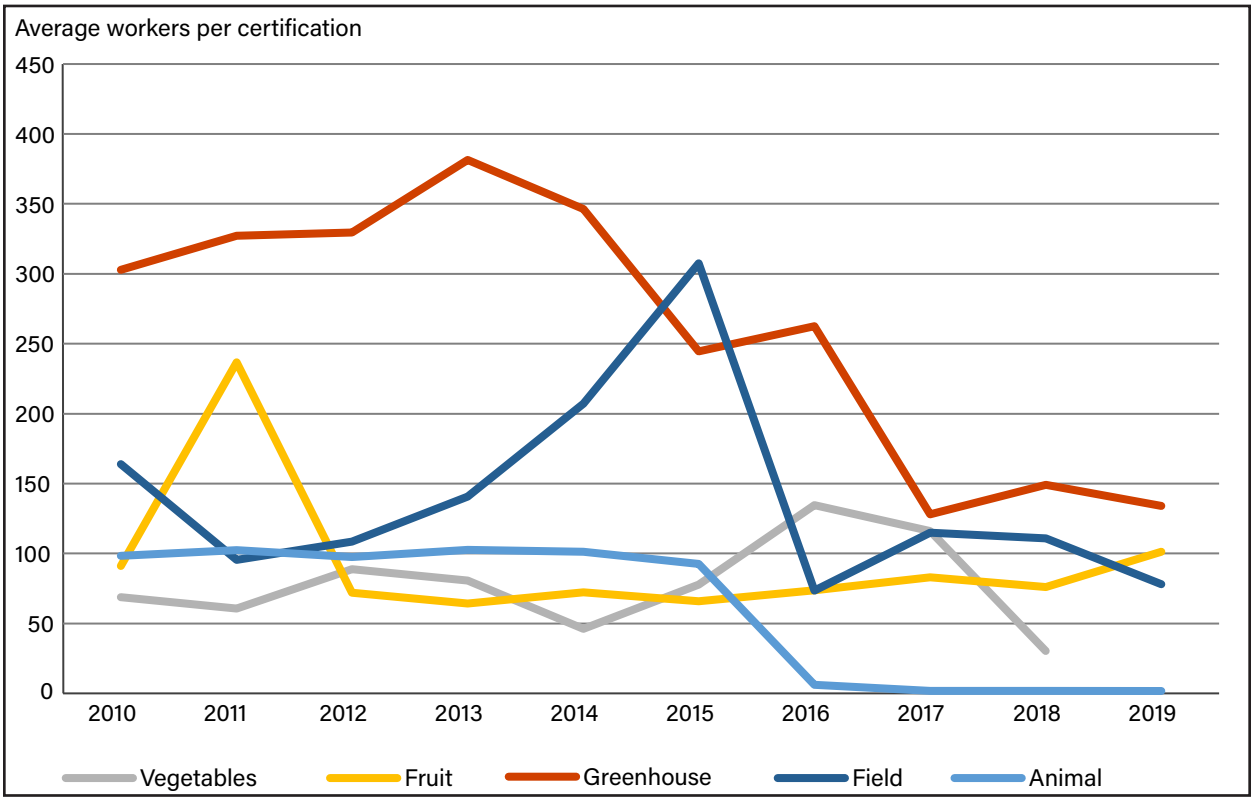
Average workers per application submitted by FLC employers, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-9

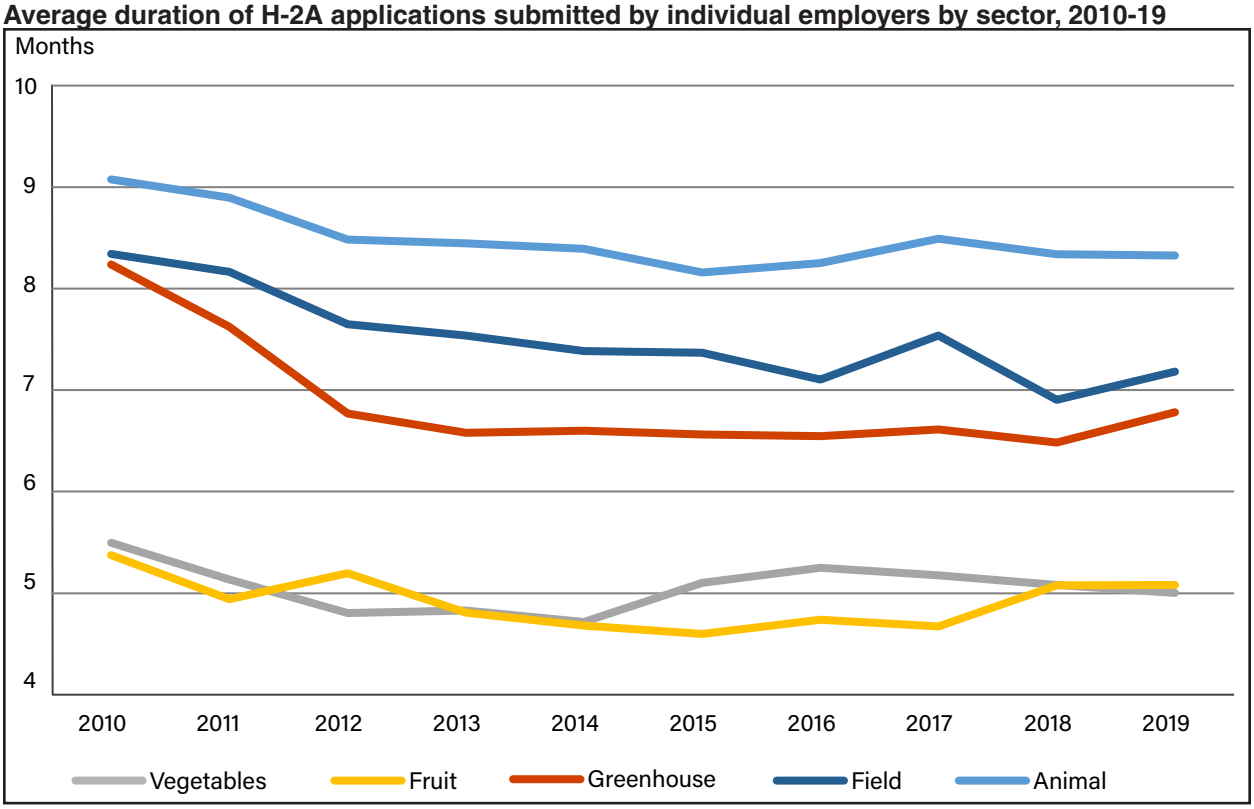
Average workers per application submitted by growers association employers, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-10

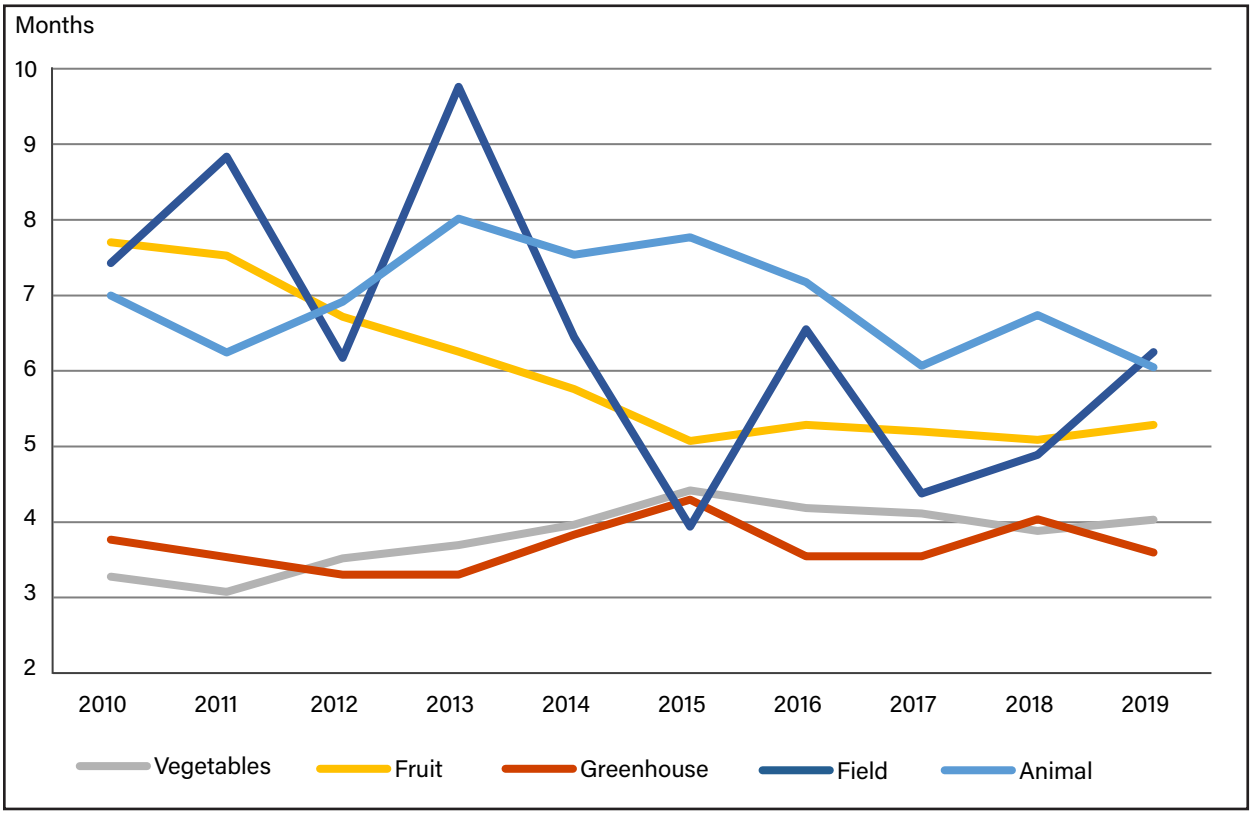
Average duration of H-2A applications submitted by individual employers by sector, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-11

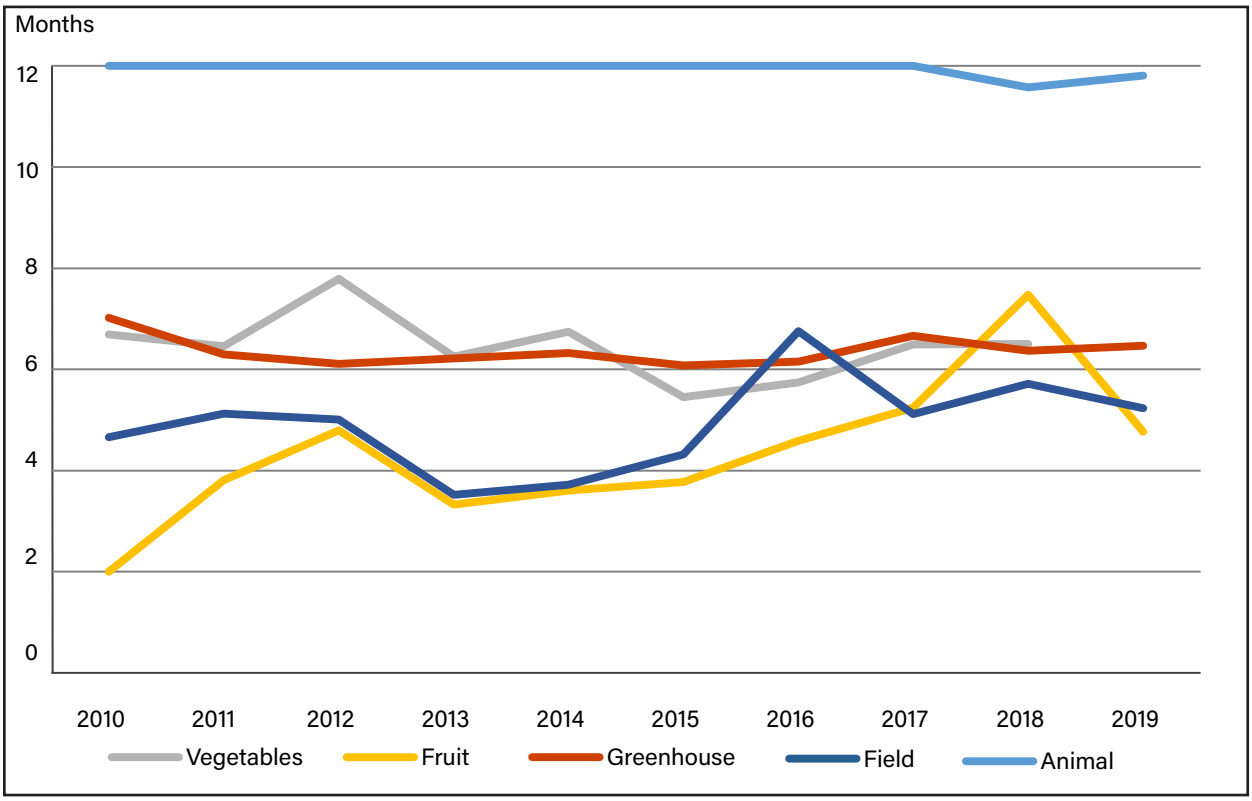
Average duration of H-2A applications submitted by FLC employers by sector, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Figure A-12

Average duration of H-2A applications submitted by growers association employers by sector, 2010-19



Source: USDA, Economic Research Service using data from United States Department of Labor, Office of Foreign Labor Certification.

Table A-4

Labor's share of U.S. agriculture's operating expenses by industry, 2017

	Share expressed as percentage		
	Contract labor	Hired labor	Labor share of production expenses
Greenhouse, nursery, and floriculture production	3.9	39.1	43.0
Fruit and tree nut farming	13.6	24.9	38.5
Vegetable and melon farming	9.2	19.6	28.8
Tobacco farming	6.9	18.0	24.9
Aquaculture and other animal production	2.1	17.6	19.6
All other crop farming	2.9	16.1	19.0
Dairy cattle and milk production	0.6	11.8	12.4
Total, U.S. agriculture	2.3	9.7	12.0
Cotton farming	1.0	9.5	10.5
Sheep and goat farming	1.3	7.0	8.3
Beef cattle ranching and farming	1.0	6.1	7.0
Hog and pig farming	1.4	4.9	6.3
Poultry and egg farming	1.4	4.3	5.7
Oilseed and grain farming	0.5	5.0	5.4
Cattle feedlots	0.2	2.2	2.3

Note: Table A-4 uses 2017 data to update table 1 in Zanhiser, Taylor, Hertz and Charlton (2018).

Source: USDA, Economic Research Service calculations using data from 2017 Census of Agriculture.

Table A-5

Labor's share of U.S. agriculture's operating expenses by industry as percentage of total, 2017

	Share expressed as percentage			
	National contract labor	National hired labor	National total labor	National expenditure share
Greenhouse, nursery, and floriculture production	6.5	15.4	13.7	3.8
Fruit and tree nut farming	41.8	18.4	23.0	7.2
Vegetable and melon farming	19.7	10.1	11.9	5.0
Tobacco farming	1.0	0.6	0.7	0.3
Aquaculture and other animal production	2.5	5.1	4.6	2.8
All other crop farming	4.7	6.1	5.8	3.7
Dairy cattle and milk production	2.7	12.4	10.5	10.2
Cotton farming	0.7	1.5	1.3	1.5
Sheep and goat farming	0.3	0.3	0.3	0.5
Beef cattle ranching and farming	4.5	6.6	6.2	10.6
Hog and pig farming	3.7	3.3	3.3	6.4
Poultry and egg farming	6.1	4.5	4.8	10.2
Oilseed and grain farming	5.0	13.3	11.7	25.9
Cattle feedlots	0.8	2.3	2.0	10.5
Total, U.S. agriculture	**100.0**	**100.0**	**100.0**	**100.0**

Source: USDA, Economic Research Service calculations using data from 2017 Census of Agriculture.

Table A-6

Top 5 primary crops in top H-2A user States, 2019

Worksite state	Primary crop	Percentage	Workers
Florida	Citrus	22	7,455
Florida	General farm workers	21	6,965
Florida	Melons	10	3,363
Florida	Strawberries	9	3,032
Florida	Tomatoes	5	1,783
Florida	Other	33	11,000
Georgia	Blueberries	24	6,982
Georgia	Onions	12	3,641
Georgia	Melons	12	3,445
Georgia	Cucumbers	6	1,783
Georgia	Peppers	5	1,530
Georgia	Other	41	12,099
Washington	General farm workers	23	5,943
Washington	Cherries	21	5,389
Washington	Apples	19	4,857
Washington	Fruits	15	3,819
Washington	Pears	7	1,846
Washington	Other	17	4,372
California	Strawberries	26	6,121
California	Lettuce	16	3,709
California	General farm workers	7	1,730
California	Vineyards	5	1,161
California	Broccoli	4	867
California	Other	42	9,733
North Carolina	Tobacco	38	8,303
North Carolina	Sweet potatoes	12	2,688
North Carolina	Christmas trees	11	2,317
North Carolina	Blueberries	8	1,838
North Carolina	Apples	5	1,104
North Carolina	Other	25	5,456
Louisiana	Sugarcane	41	4,432
Louisiana	Crawfish	12	1,333
Louisiana	Sweet potatoes	10	1,023
Louisiana	Rice	8	890
Louisiana	Agricultural equipment operators	6	684
Louisiana	Other	22	2,402
Michigan	General farm workers	26	2,402
Michigan	Nursery and greenhouse workers	12	1,081
Michigan	Apples	9	864
Michigan	Corn	9	831
Michigan	Asparagus	6	529
Michigan	Other	37	3,389
Kentucky	Tobacco	66	5,508
Kentucky	Nursery and greenhouse workers	13	1,121
Kentucky	General farm workers	7	614

Kentucky	Hemp	4	335
Kentucky	Hay and straw	2	201
Kentucky	Other	6	532
New York	Apples	47	3,823
New York	General farm workers	13	1,051
New York	Vegetables	5	419
New York	Onions	4	341
New York	Cabbage	4	321
New York	Other	26	2,146
South Carolina	General farm workers	41	2,513
South Carolina	Peaches	22	1,331
South Carolina	Tomatoes	10	632
South Carolina	Broccoli	9	575
South Carolina	Eggplants	4	240
South Carolina	Other	13	791