Farm Labor Shortages, Their Implications, and Policy Options to Help Promote the Domestic Fresh Produce Industry

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1. Introduction

Farmers in the United States (US) grow hundreds of labor-intensive fruits and vegetables, and most farmworkers were born outside of the United States. Mexico's close proximity to the US, and its relatively poor economic conditions, incentivized migration to the US during the 1900s and early 2000s (Congressional Research Service (hereafter CRS), 2008). Many of these migrants entered the US without legal authorization and sought work on US farms (Martin and Duignan, 2003). High levels of Mexico-US migration enabled US agricultural producers to maintain access to an abundant supply of labor and expand production of labor-intensive crops to satisfy increased demand. However, in recent years, US farm labor markets have undergone substantive structural changes that have increased the prevalence of farm labor shortages, and fresh produce farmers are facing new challenges (Charlton and Taylor, 2016; Richards, 2018).

A shortage of labor is arguably the most pressing issue facing American farmers today (American Farm Bureau, 2022). Recently, the White House (2022) released a memorandum titled: **National**

Security Memorandum on Strengthening the Security and Resilience of United States Food and Agriculture, which provides a set of goals to help ensure the food and agricultural sector can be sustained, particularly during times of national crisis. The White House memorandum broadly discusses the need to secure an "***essential workforce***" and "***prepare for and respond to incidents with broad impacts on our national and economic security.***" Food security ties directly into a number of national security issues. There is urgent need for labor policies that facilitate food supply chain resilience, such as those that may result from another global pandemic like COVID-19 or a major global or regional armed conflict (US Department of Defense, 2024).

Farm employers are concerned about the increased prevalence of labor shortages, yet policy solutions remain elusive (Richards, 2018; Rutledge, 2022; Heller, 2023). Domestic producers are turning to the H-2A visa program to help backfill the declining supply of domestic labor (Castillo et al., 2022), but the H-2A program is costly, administratively burdensome, and employers are not allowed to hire H-2A workers to fill year-round job vacancies. Industry sources cite ongoing problems with the H-2A program, including minimum wage increases that are based on a survey that has shortcomings and was not designed for the H-2A program (Galloway, 2023; Florida Growers v. DOL, 2023). Proposed farm labor legislation includes revisions to the H-2A program, a pathway to legal status for undocumented farmworkers, and changes to the data source and methodology used to determine each year's H-2A minimum wage known as the Adverse Effect Wage Rate or by its acronym the "AEWR" (Lofgren, 2023). However, these proposals have failed to garner sufficient bipartisan support.

Labor supply pressures drive farm wages up (Charlton et al., 2019), stunt growth opportunities for American farmers (Rutledge and Mérel, 2023), accelerate the need for labor-saving technologies (Cline, 2011; Souza, 2020; Win et al., 2023), and force production to other countries that have lower labor costs (Zahniser et al., 2023). Increased reliance on imports exposes the US to food security risks should a major crisis emerge and may create new social costs, such as transportation-related carbon emissions, exposure to less stringent food safety and production standards, and lower food quality (Rutledge and Mérel, 2023).

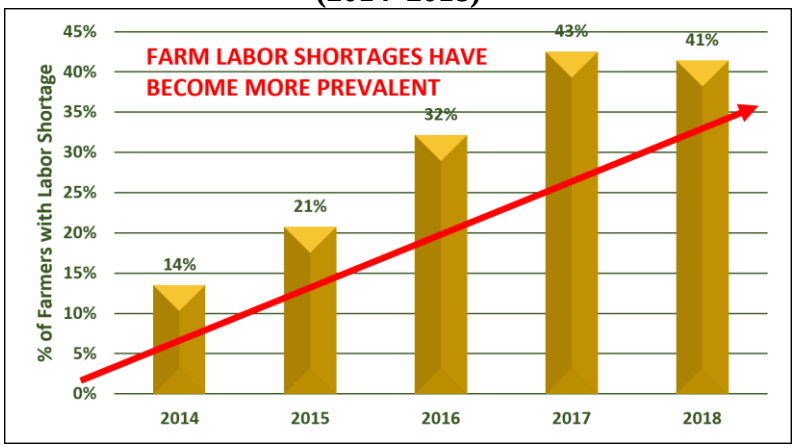
The farming of fresh produce in the US is at an inflection point that could determine whether fruits and vegetables are grown on US soil in the future. If policy solutions are not implemented soon, American farmers will continue to lose market share to foreign producers, and the agricultural landscape will become less diverse. What happens (or doesn't happen) next will have far-reaching ramifications for US food security and, more generally, the strategic global posture of the United States.

The following section of this report provides context about the prevalence of farm labor shortages. Section 3 discusses the implications of these labor shortages, section 4 provides ideas about policy options that could help address labor shortages and promote domestic fruit and vegetable production, and section 5 provides some concluding thoughts. References cited in this report can be found in section 6.

2. Farm Labor Shortages Are Prevalent Throughout the United States

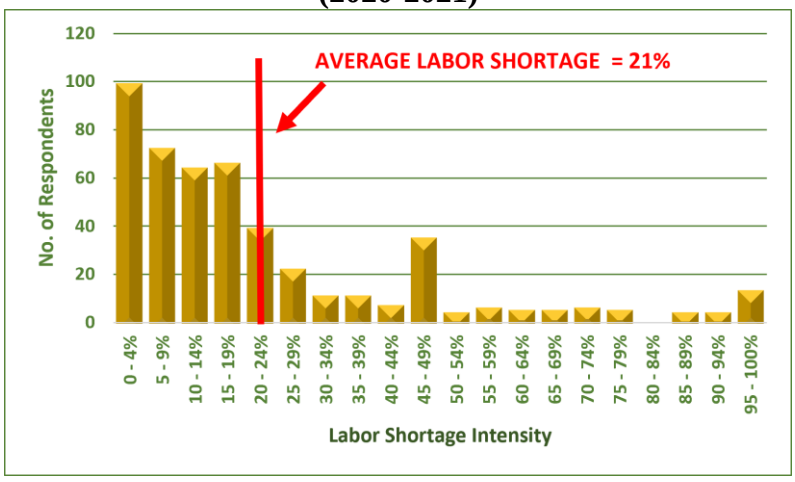
Farm employer surveys conducted by researchers at the University of California, Davis and Michigan State University show that the percentage of farmers reporting labor shortages increased from 14% in 2014 to 41% in 2018 (see Figure 1; Rutledge and Taylor, 2019). During the pandemic, the percentage of farmers reporting labor shortages rose to 53% (AmericanHort, 2022; Rutledge et al., 2022a, 2022b, 2022c). When asked how severe their labor shortages were, the average farmer reported they were unable to hire 21% of the workforce they would have hired under normal circumstances (see Figure 2).

Figure 1. Percent of Farmers Reporting Labor Shortages (2014–2018)



Source: 2019 Adapting to Farm Labor Scarcity Survey (Rutledge and Taylor, 2019).

Figure 2. Farmers Report 21% Average Labor Shortage (2020-2021)



Source: 2022 Farm Employer Labor Scarcity Surveys (Rutledge et al., 2022a, 2022b, 2022c).

Farm labor shortages threaten the stability of the domestic food supply, which threatens the national security of the United States. Moreover, this issue weakens the geopolitical posture of the US. To the extent that the US is less capable of producing the food its citizens need, it will increasingly be at the mercy of foreign nations. Thus, farm labor shortages weaken the strategic position of the US.

Labor supply pressures also put upward pressure on farm wages and cause farmers to change production and labor management practices. Policies that address labor challenges are needed or the domestic production capacity of critical fresh fruits and vegetables will decline. Increased reliance upon foreign producers to provide these essential healthy foods creates unnecessary risk exposure to potential supply chain disruptions, which could be exacerbated during times of crisis.

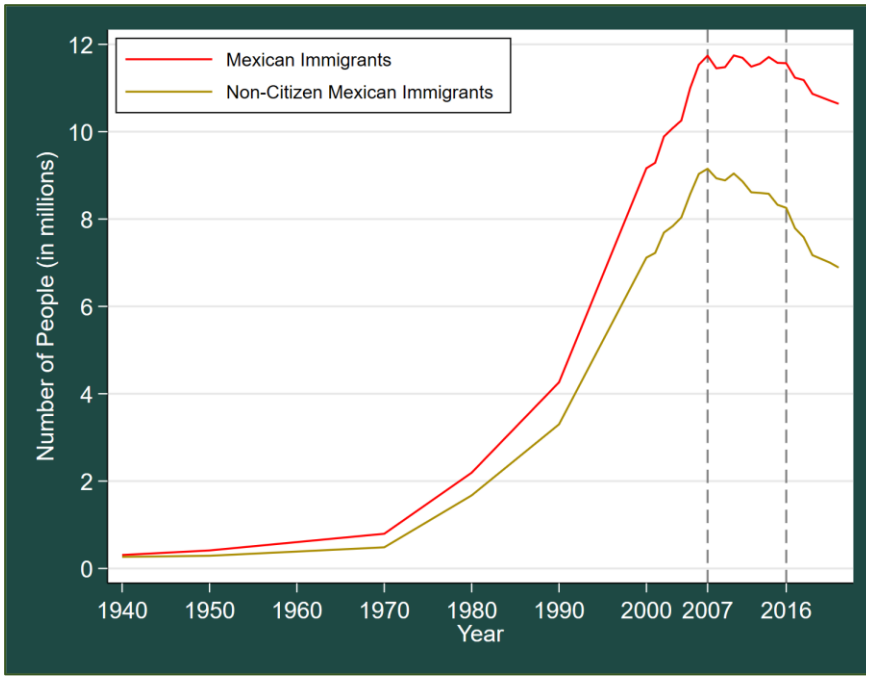
Table 1. Summary of US Crop Farm Workforce

	Crop Farm Workforce
Immigrant	69%
Mexican if foreign-born	93%
Unauthorized to work in the US	40%
Male	68%

Source: National Agricultural Workers Survey FY 2017 – FY 2020 (DOL, 2022).

The US-based crop farm workforce is largely made up of immigrant employees, mostly from Mexico. According to the National Agricultural Workers Survey (NAWS), 7 out of every 10 US-based crop farm employees were born outside of the US, and 9 out of every 10 who are foreign-born were born in Mexico (see Table 1).[2] Moreover, 4 out of every 10 are not legally authorized to work in the US. This dependence upon immigrant workers makes American agriculture particularly susceptible to immigration enforcement efforts, competition from other sectors of the economy that employ immigrant workers, and many other factors.

Figure 3. The Mexican Immigrant Population Is Declining

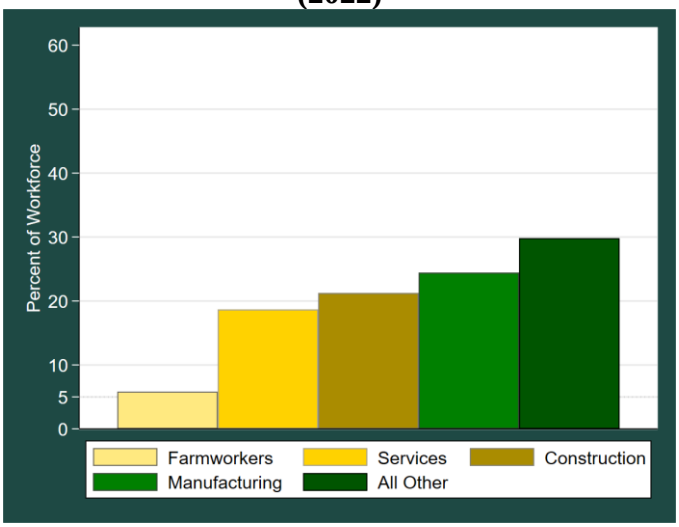


Source: US Census and American Community Survey Data obtained from the Integrated Public Use

Figure 3 reveals that the Mexican immigrant population (top red line) residing in the US increased from less than 1 million in 1940 to nearly 12 million at the start of the Great Recession. However, since 2016, the Mexican immigrant population has declined. Moreover, the number of non-citizen Mexican immigrants in the US (bottom gold line) has been on a downward trajectory since its peak of 9 million at the beginning of the Great Recession, and this number continues to fall. A smaller Mexican immigrant population means fewer employees willing and able to work on US farms. This factor is just one of many that makes it difficult for US farmers to secure an adequate US-based farm workforce. Furthermore, competition from the construction and food service sectors, among others (see Figure 4), is pulling employees away from agriculture (Mérel and Rutledge, 2023). All these factors have contributed to a decline in the US-based farm labor supply.

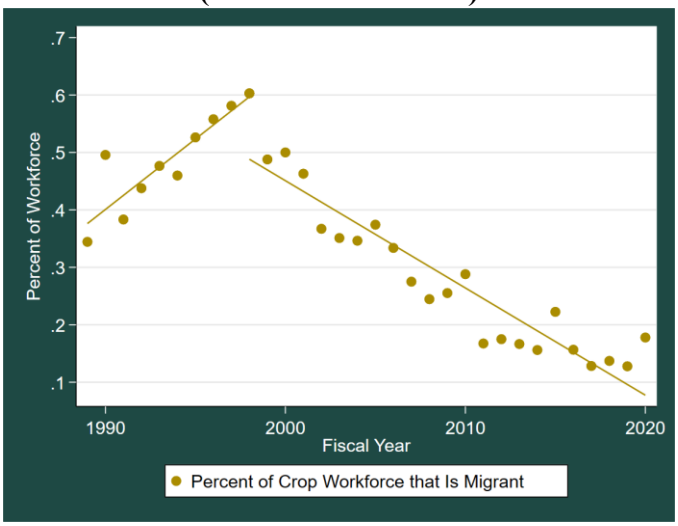
[2] Throughout this report, the term "US-based" refers to non-H-2A farm employees.

Figure 4: Percentage of Mexican Immigrant Workforce, by Sector (2022)



Source: American Community Survey Data (Ruggles et al., 2024)

Figure 5. Percentage of US-Based Crop Farmworkers Who Are Migrants (FY 1989 – FY 2020)



Source: National Agricultural Workers Survey (DOL, 2022)

Prior to 2000, a significant share of Mexican-born agricultural workers engaged in follow-the-crop migration. However, since the turn of the millennium, these individuals are more likely to be settled in the US and less willing to migrate for harvest work (see Figure 5 and Fan et al., 2015). Thus, the geography of farm labor markets has become smaller with fewer employees willing to travel to satisfy seasonal demand for harvest labor.

3. Implications of Farm Labor Shortages

3.1 Farm Labor Shortages Create Production Losses for American Farmers

When farmers are unable to hire all the workers they need, their capacity to harvest declines, and they may not be able to get their crops to market (see Figure 6). This issue causes American farmers, who have invested their blood, sweat, and tears, to suffer significant economic losses (Clemens et al., 2018). This problem threatens the ability of American farmers to continue growing healthy fresh produce on US soil, limiting the ability of America to feed itself and its global partners. Moreover, when farmers go out of business, rural communities suffer. When high-value fruit and vegetable production is replaced by row crops or other land uses, the local infrastructure that supports these industries (e.g., packing houses, trucking businesses, etc.) may be lost. As such, the detrimental impacts of high-value production losses extend beyond the farm into local communities.

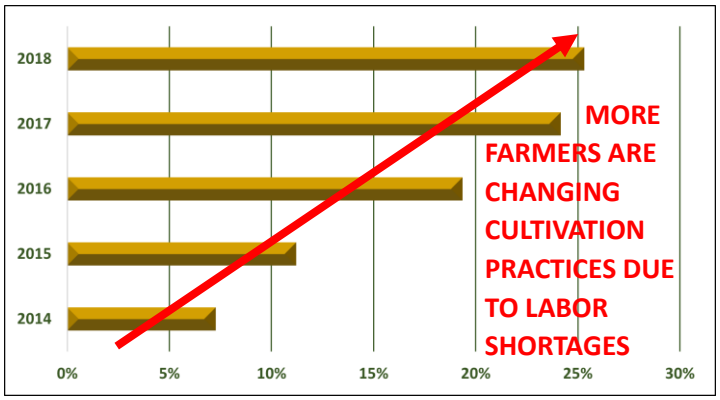
Figure 6. Pear Farmer Loses Crop Because of Labor Shortage

Source: https://www.nytimes.com/2006/09/22/washington/22growers.html

Farmers who face labor shortages also have to make changes to their production and labor management practices, which affects how they farm and what they can grow. To highlight this fact, a 2019 survey of 1000 California farmers by the University of California, Davis and the California Farm Bureau Federation found that farmers made significant changes to deal with labor shortages. Data from this survey show that 39% had to make a change to their usual cultivation practices (see Figure 7), 37% tried using labor-saving technologies, 27% turned to farm labor contractors for the first time, and 5% switched some acreage out of labor-intensive crops into non-labor-intensive crops, mostly into nuts. The most common technologies adopted were mechanical harvesters and specialized tractor attachments. Some common changes in cultivation practices were reductions and delays in harvesting, pruning, and weeding.

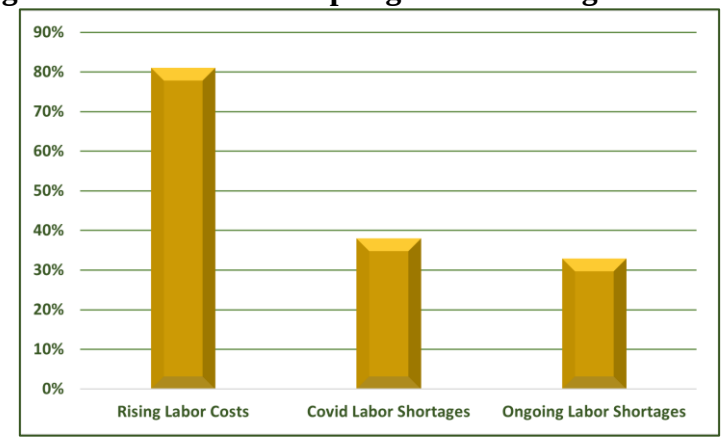
In a set of follow-up surveys in 2022 on a national sample of 1,300 farm employers, 80% of farmers who reported adopting a labor-saving technology said they did so because of rising labor costs, while 30% said it was due to labor shortages (see Figure 8; AmericanHort, 2022; Rutledge and Taylor, 2019; Rutledge et al., 2022a, 2022b, 2022c). However, 35% said the new technology failed to reduce the share of their business costs spent on labor (see Figure 9). These findings are a clear indication that the current state of mechanization is not capable of fully replacing careful human hands and eyes for essential tasks like harvesting fruits and vegetables. Industry sources claim there are significant challenges that remain with respect to fresh market fruit and vegetable harvest technology (Guyer, 2023). These challenges include an inability of artificial intelligence vision systems to see under foliage, difficulty reaching into the interior canopy of plants and trees to retrieve fruits, and damage during the transport phase from the plant to collection bins. Estimates indicate that technologies can only see about 40% to 50% of the fruit on the plant, a level that makes harvesting with machines economically infeasible from a business standpoint (Guyer, 2023).

Figure 7. Percent of Farmers Changing Cultivation Practices Because of Labor Shortages (2014-2018)



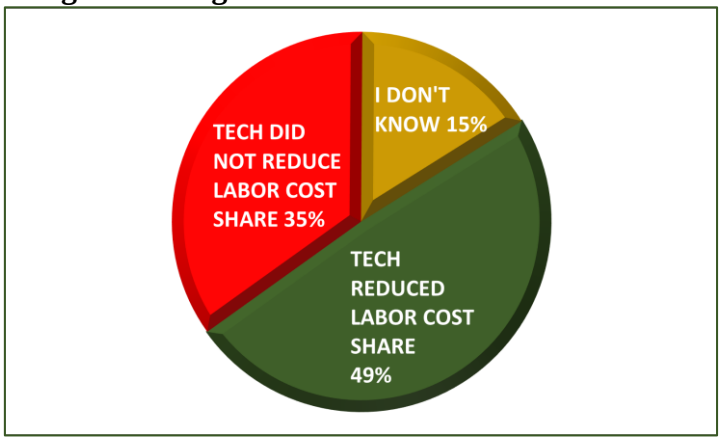
Source: 2022 Farm Employer Surveys (Rutledge et al. 2022a, 2022b, 2022c).

Figure 8. Reasons for Adopting Labor-Saving Technology



Source: 2022 Farm Employer Surveys (Rutledge et al. 2022a, 2022b, 2022c).

Figure 9. 35% of Farmers Reported that New Labor-Saving Technologies Did Not Reduce Labor Cost Share



Source: 2022 Farm Employer Surveys (Rutledge et al. 2022a, 2022b, 2022c).

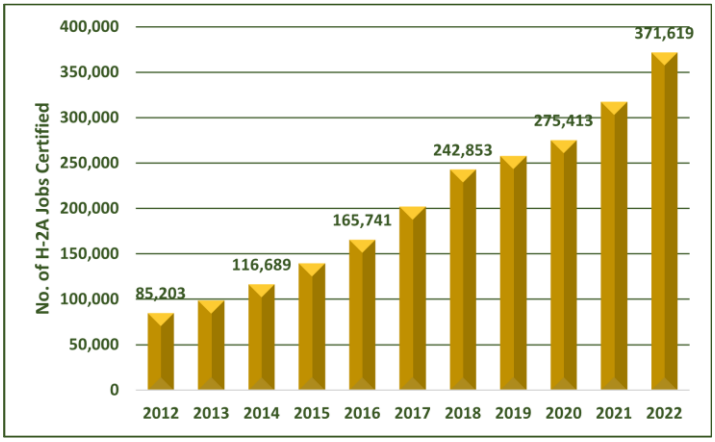
Recent research published in the American Journal of Agricultural Economics indicates that a 10% reduction in the number of employees willing to supply labor to the market leads to as much as a 4.2% in fruit and vegetable production losses and up to a 5.5% decrease in revenue (Rutledge and Mérel, 2023a, 2023b). To put this in perspective, a 21% labor shortage (see Figure 2) could cause a 9% reduction in domestic fruit and vegetable production and an 11% reduction in revenue. Estimates from the USDA indicate that US fruit and vegetable production is worth $42 billion at the farm gate per year (Fresh Fruit Portal, 2023), so a 21% labor shortage could translate to $5 billion in direct losses for fresh produce farmers each year. The impact on the broader economy would be much larger when considering the upstream and downstream businesses that rely on these farms.

3.2 Farm Labor Shortages Create Reliance on the H-2A Visa Program

In 1952, the H-2 program was created with the passage of the Immigration and Nationality Act, permitting foreign employees to enter the US on a temporary basis to perform low-skilled labor. When the the Immigration Reform and Control Act passed in 1986, the H-2 program was split into H-2A for agricultural workers and H-2B for non-agricultural workers. There is no cap on the number of H-2A visas that can be issued. However, the US Department of Labor (DOL) must certify that US workers are not available and that H-2A workers will not have adverse effects on US workers before farm employers can recruit and employ H-2A employees.

H-2A employment was historically low, but it increased over 300% between FY 2012 and FY 2022 from 85,000 jobs certified to over 370,000 (see Figure 10). In 2023, the DOL certified agricultural employers to fill between 15% to 20% of the full-time equivalent (FTE) jobs on US crop farms with H-2A guest workers, accruing an estimated H-2A wage bill of about $6 billion.

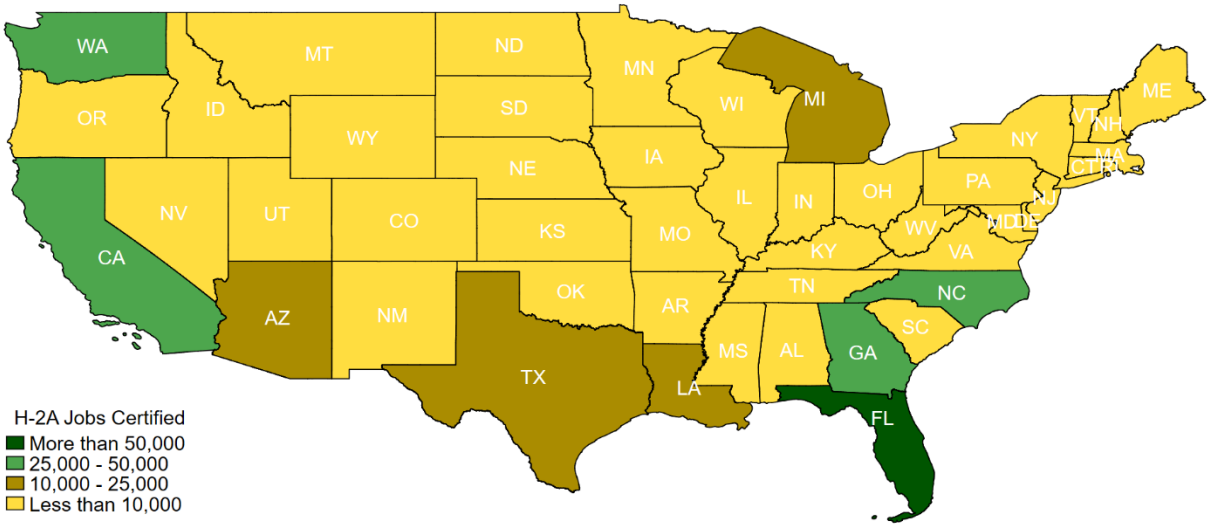
Figure 10: Number of H-2A Jobs Certified, FY 2012 – FY 2022



Source: https://www.dol.gov/agencies/eta/foreign-labor/performance

Most of the states certify less than 10,000 employees per year, and a few account for the majority of H-2A employment (see Figure 11). During fiscal year 2023, 9 states had more than 10,000 H-2A jobs certified, accounting for two-thirds of all jobs certified. Florida led the nation with 14% of the jobs certified (52,000 jobs). The next leading states were California with 11% (41,000 jobs), Georgia with 10% (38,000 jobs), Washington with 9% (36,000 jobs), and North Carolina with 7% (26,000 jobs). Together, the top five H-2A employment states had nearly 200,000 H-2A jobs certified and accrued an estimated H-2A wage bill of nearly $3 billion (see Table 2 and Figure 12).

Figure 11. Number of H-2A Jobs Certified by State in FY 2023



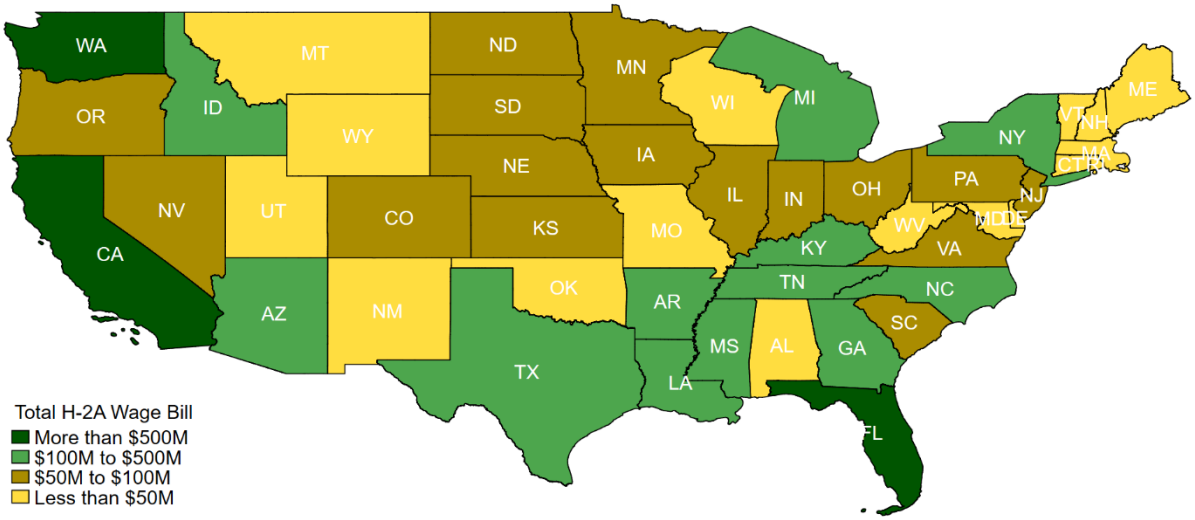
Source: https://www.dol.gov/agencies/eta/foreign-labor/performance

Table 2. H-2A Jobs Certified and Wage Bill by State in FY 2023

State	H-2A Jobs Certified	Estimated H-2A Wage Bill (in millions)
Florida	51,987	$695.3
California	40,758	$685.4
Georgia	37,536	$359.1
Washington	35,680	$644.5
North Carolina	26,146	$401.1
Total of Top 5	192,107	$2,785.4

Source: https://www.dol.gov/agencies/eta/foreign-labor/performance

Figure 12. Estimated H-2A Wage Bill in FY 2023

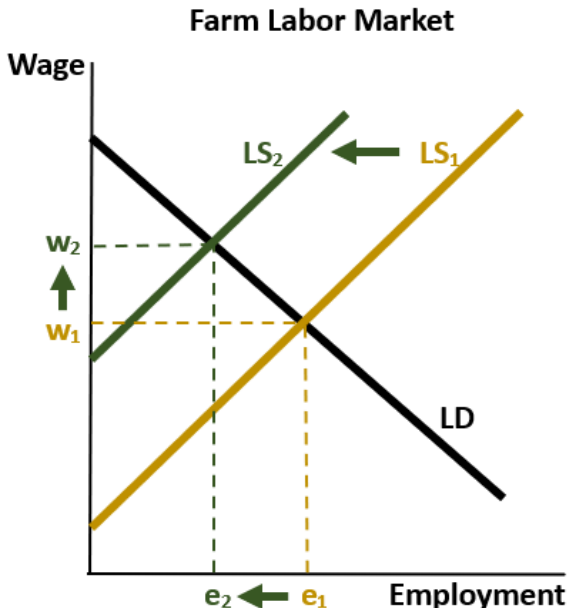


Source: https://www.dol.gov/agencies/eta/foreign-labor/performance

3.3 Farm Labor Supply Pressures Drive Farm Wages Up

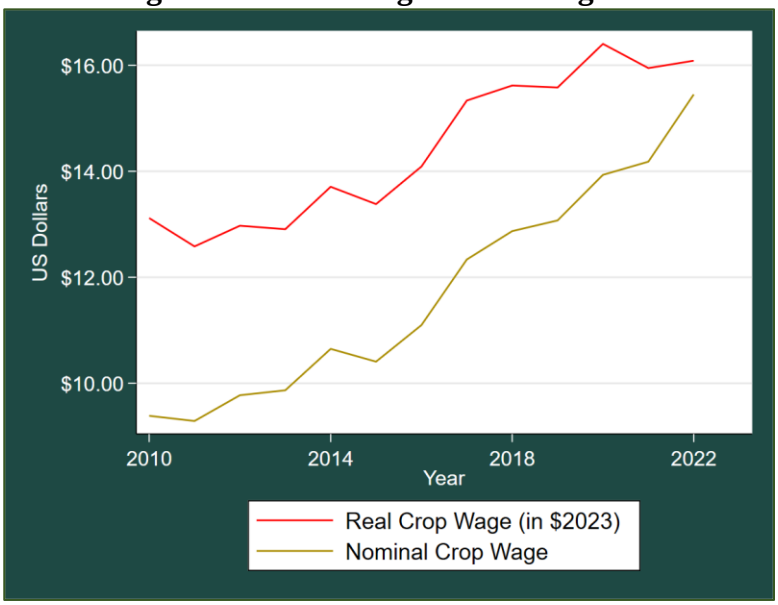
A fundamental theory of labor economics suggests that when the supply of labor declines, employment will fall, and wages will rise. A simple textbook depiction of this can be found in Figure 13, where the downward sloping labor demand curve is denoted by the **black LD** line, and the upward sloping labor supply curves are denoted by the **gold LS_1** line before the decline in labor supply and the **green LS_2** line after the decline (shift to the left). As shown in the figure, the decline in labor supply from **LS_1** to **LS_2** results in lower employment (a decline from **e_1** to **e_2**) and an increase in the wage (an increase from **w_1** to **w_2**).

Figure 13. US-Based Farm Labor Market Dynamics



In the US, farm wages have been rising, and farmers continue to report labor shortages. This evidence is consistent with the declining US-based farm labor supply scenario above. Figure 14 shows that, after accounting for inflation, farm wages have risen by more than 20% over the past decade (top red line). Without accounting for inflation, farm wages have increased by more than 40% since 2010 (bottom gold line). Moreover, farm wages have been rising at a faster rate than wages in the rest of the economy, suggesting that labor supply pressures are more pronounced in the agricultural sector than in other sectors. The growth in US-based hired crop farm wages averaged 4.8% per year between 2012 – 2022 but only 3.0% in all other occupations.

Figure 14. Farm Wages Are Rising Fast



Source: National Agricultural Workers Survey FY 2010 – FY 2022 (DOL, 2022)

Low-skilled foreign-born employees tend to demand lower wages than US-born workers and have often been viewed as an economic threat to the US-based farm workforce (CRS, 2008).

The AEWRs are state-level minimum wages that must be paid to foreign agricultural guest workers working in the US under the H-2A visa program and the US farmworkers who work for H-2A employers.[3] The AEWRs were originally implemented to help prevent US farmworkers from facing downward wage pressure as a result of competition from foreign workers (CRS, 2008). However, unlike other minimum wages that change intermittently every few years, the AEWRs are adjusted every year. The AEWRs are supposed to reflect the average wage in the region from the previous year, but the data source and methodology used to determine them do not reflect local market conditions in many cases (Crittenden, 2020; Lewison, 2021).

In 2024, the AEWRs ranged from a low of $14.53 in the southeastern part of the country to a high of $19.75 in California (see Figure 15). The USDA's Agricultural Labor Survey (also known as the Farm Labor Survey or "FLS") is used to set the AEWRs for most H-2A employees. One concern about the FLS has to do with sample selection bias, which may create local wage estimates that are not statistically representative of employees in the local labor market. If the FLS does not permit a statistically representative measure of the average wage measure in the region, it may create unintended secondary consequences that could be harmful to US farm employees and employers. For example, farm employers may have to pay wages that are significantly higher than the typical wage in the local market, and farm employees may lose hours of work or become unemployed. Rutledge (2023a) finds that some farm employers in California may have overpaid millions of dollars when compared to the average relevant market wage (see Table 3).

Table 3. Excess H-2A Wage Bill for Top 5 California H-2A Employers in 2021

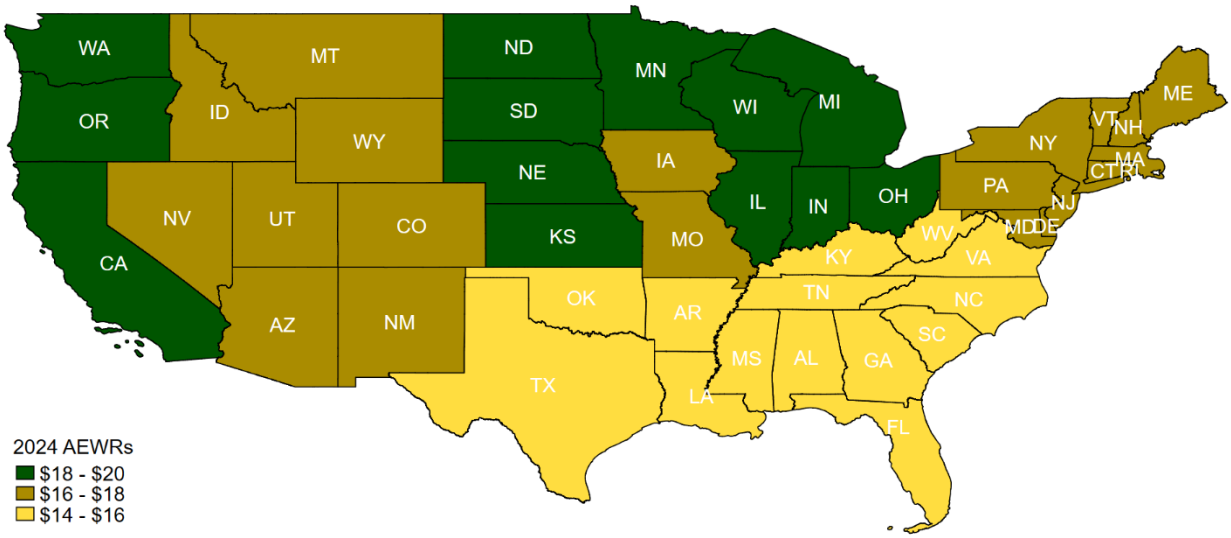
Employer Name	Excess H-2A Wage Bill
Fresh Harvest, Inc.	$6,594,198
Foothill Packing, Inc.	$5,203,884
Rancho Nuevo Harvesting, Inc.	$3,285,808
Elkhorn Packing Co. LLC	$2,995,220
Royal Oak Ag Services	$2,854,433

The FLS is supposed to provide "the basis for employment and wage estimates for all workers directly hired by U.S. farms and ranches (excluding Alaska)" (NASS, 2021). According to the instructions on the USDA's Agricultural Labor Survey, employers are instructed to exclude wages paid to workers hired through farm labor contractors (see Figure 16). The exclusion of these employees will cause the FLS average wage estimate to overstate the true average hourly wage in a region if (i) these workers are employed in the FLS region and (ii) the wages paid to these workers in the region are, on average, lower than the wages of the other employees included in the FLS. It turns out that workers employed by labor contractors are usually paid less than those hired directly by farmers, so their exclusion from the FLS sample could cause the AEWRs to overstate the local market wage in some cases. A recent case study of California determined that the FLS caused the California AEWR to overstate the market wage by about $2.00 (Rutledge, 2023a), so this issue is not trivial.

[3] Specifically, they must be paid the highest of the state or federal minimum wage, the prevailing wage as determined by a state workforce agency, the negotiated collective bargaining agreement wage, or the relevant state AEWR. Except in rare cases, the AEWR is almost always the applicable wage rate.

In the continental US, 11 states had their AEWRs increase by at least $1.00 in 2022, 30 states in 2023, and 12 states in 2024. Ten states had their AEWRs increase by at least $1.00 in both 2023 and in 2024. Twenty-one states had their AEWRs increase by an average of at least a dollar each year between 2022 and 2024 (at least $2.00 total) and 8 between 2021 and 2024 (at least $3.00 total).

Figure 15. 2024 Adverse Effect Wage Rates



Source: https://quickstats.nass.usda.gov

Figure 16. Farm Labor Survey Instructions Exclude Farm Labor Contractor Employees

Section 1 - Paid Workers for October

October 2023

S	M	T	W	Th	F	S
1	2	3	4	5	6	7
8	**9**	**10**	**11**	**12**	**13**	**14**
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Instructions for Reporting Agricultural Workers

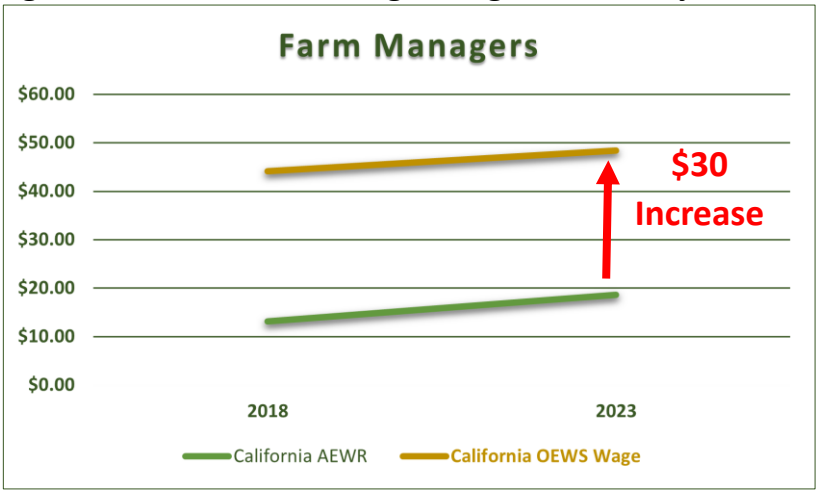
- Agricultural workers are workers directly hired and paid by the farm operation to perform work on a farm or ranch in connection with the production of agricultural products.
- INCLUDE part-time workers, paid family members, hired managers, and workers on paid leave. INCLUDE workers regardless of method of pay (hourly, salaried, piece rate, etc.).
- Do NOT INCLUDE workers hired through a contractor, custom workers (workers hired to use their machines to perform a service on the farm e.g., combining, fertilizing), retail workers, or value added workers (workers who materially alter the form of the product produced e.g., winery, dairy manufacturing plant workers).

Source: https://www.nass.usda.gov/Publications/Methodology_and_Data_Quality/Farm_Labor/11_2023/ALSReport%20Form_102023.pdf.

On February 28th, 2023, the DOL published a Final Rule, outlining changes to the way AEWRs are calculated. In this Final Rule, the DOL justifies its decision on the basis that the amount of excess wages (or "transfers" from employers to employees) would be small. The February 28th Final Rule requires one AEWR to be set by the FLS for every state for a handful of common occupational titles and wages for all other job titles to be set by the Occupational Employment and Wage Statistics Survey. Their estimates suggest that over a 10-year period, there would be approximately $375 million in transfers from H-2A employers to employees.

A close inspection of their analysis conducted by Rutledge (2023b) reveals that their estimate understates the true value by at least $100 million and up to $1 billion if even a small percentage (4%) of employees have their occupational titles updated based on the rule. As such, the new rule creates significant increases in labor costs for some H-2A employers. Figure 17 indicates that H-2A employers in California had to increase the wage they pay to H-2A farm managers by $30 per hour, and supervisors and truck drivers had their wages raised by $10 per hour. For many employers, the magnitudes of these increases are not sustainable.

Figure 17. H-2A Farm Manager Wage Increases by $30/hour



Source: https://quickstats.nass.usda.gov

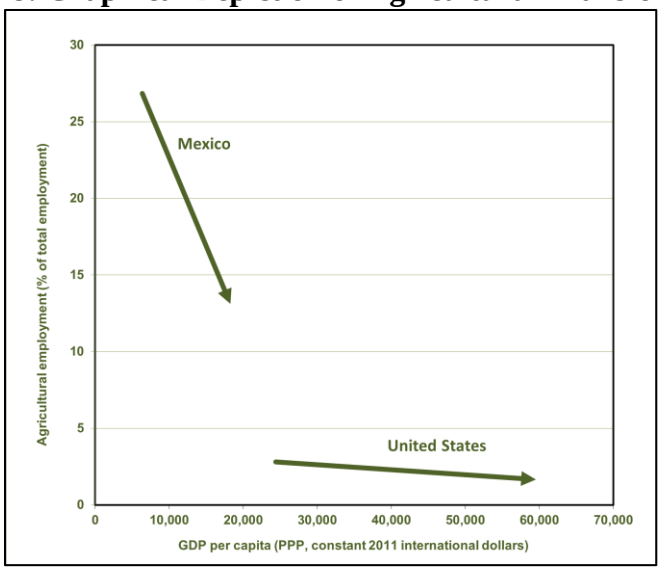
3.4 Farm Labor Shortages Create Economic and Societal Problems

A number of other problems are associated with farm labor shortages and the impacts they have on domestic fruit and vegetable production activities. First, Mexico is undergoing its own economic transformation, and its workforce is transitioning out of agricultural labor. Figure 18 depicts the US and Mexico's agricultural transformation processes by showing arrows that characterize their labor force development trajectories over time. The share of each country's total labor force working in the agricultural sector is displayed on the vertical axis, and their measures of wealth (per-capita Gross Domestic Product) are displayed on the horizontal axis. The base of the arrows depict each country's position in 1991, and the arrowheads depict the countries' positions in 2017.

In the US, the agricultural transformation was nearly complete by the mid-1900s when the farm labor force was largely comprised of Mexican immigrants entering the US through the World War II Bracero Program. Today, only 2% of the US labor force works in agriculture. As seen below, Mexico is behind the US in terms of this agricultural transformation, but it is catching up rapidly.

Over time, fewer Mexican-born workers will be willing to work on farms, and the US will either have to recruit workers from farther away or mechanize labor-intensive tasks if it wants to maintain fresh fruit and vegetable production activities.

Figure 18: Graphical Depiction of Agricultural Transformation



Source: World Bank (https://data.worldbank.org).

As Mexico's labor force transitions out of agriculture, US imports will have to be procured from countries that are farther away. However, imports coming from distant countries may have shorter shelf lives once they reach US markets, there could be higher risk of contamination due to limited reach of government oversight (CRS, 2020), and there are additional costs associated with transportation and carbon emissions (Rutledge and Mérel, 2023). Therefore, farm labor shortages could ultimately leave American consumers with lower quality fresh produce and create new economic and societal burdens.

4. Policy Options for Addressing Farm Labor Shortages

4.1 Migration Policy

4.1.1 Green Cards for Farmworkers

To ensure an adequate number of individuals are available to work on US farms, one option is to make policy changes that increase legal migration opportunities for employees from Mexico and Central American countries who are willing to work in the agricultural sector. Currently, the US issues about one million immigrant visas (green cards) per year, most of which are issued to family members of US citizens. The other 20% are issued to refugees, asylees, and individuals with other special statuses (Gelatt, 2020). As of 2020, there was a backlog of 1.2 million Mexicans on the waitlist to receive a green card (Gelatt, 2020). In fiscal year 2023, the House Committee on Homeland Security revealed 2.5 million encounters with individuals seeking to enter the southwest border of the US (US House of Representatives, 2023). These numbers demonstrate that the current number of visas issued is insufficient to meet the demand for entry to the US.

Recent testimony by Representative Slotkin stated the following: "Immigration in the United States should be based on the needs of the US economy and the employers in the United States"

(Slotkin, 2024). Slotkin's idea that immigration opportunities should promote the interests of America is not a new concept, but her remarks are a good reminder that reforms could be tailored to meet critical labor force needs in certain sectors, such as agriculture. A clear case can be made for increased immigration opportunities for individuals willing to perform year-round work on US farms in need of those types of employees.

One option that might help achieve this goal is a program that would offer the 1.2 million individuals in Mexico's green card backlog an opportunity to have their visas expedited in exchange for an agreement to perform a certain amount of agricultural work. Another option would be to include a new category of permanent immigrant visas specifically for the agricultural sector.

4.1.2 Agricultural Work Authorization for Undocumented Immigrants

To provide some relief to employers in the fresh produce industry, policymakers could offer legal work authorization to unauthorized immigrants who are willing to perform a certain amount of work on US farms. A similar proposal has been put forth in the Farm Workforce Modernization Act (FWMA), which was re-introduced in 2023 after failing to pass through the Senate during the 2022 lame duck session (Representative Lofgren, 2023). The FWMA would allow farmworkers to seek and obtain Certified Agricultural Worker (CAW) status, which is a temporary legal status for workers who have been engaged in agricultural work for at least 180 days during the previous 2 years. Under the FWMA, CAW status could be renewed every year if employees continue to engage in agricultural work for at least 100 days per year. Employees would not be required to do anything else to keep their legal status, but they could earn a green card if they pay a $1,000 fine and continue to engage in agricultural work for (i) four more years if they have done at least 10 years of agricultural work in the U.S. or (ii) eight more years if they have done less than 10 years of agricultural work in the U.S. An alternative to this FWMA provision would be to extend opportunities to obtain work authorization to employees in the broader economy while attaching similar agricultural sector work requirements to the work permits.

4.2 H-2A Visa Policy

4.2.1 Freezing or Capping the AEWRs

As mentioned in Section 3, farm wages have been rising fast, and their growth has become unsustainable for many fresh produce farmers. Moreover, the AEWRs are higher than local market wages in many cases, creating challenges for farmers in those regions who notoriously operate on tight profit margins and face price pressures from international competitors. One option to address this issue is freezing the AEWR at current levels for a period of time and reassessing whether they should be increased at a later date. Recently, Congressman John Moolenaar (2023; R-Michigan) introduced the "***Supporting Farm Operations Act***" (HR 7046), which would freeze the AEWRs until the end of 2025.

According to recent DOL estimates, an AEWR freeze would save employers of H-2A workers an estimated $140 million a year (DOL, 2020). Castillo et al.(2022) estimate that an AEWR freeze could also save H-2A employers an additional $29 million per year for the corresponding US workers who are employed by these employers. In addition to the economic impacts associated with the direct employment of H-2A workers, any proposed changes to the AEWR could potentially save employers of non-H-2A workers hundreds of millions of dollars due to pressure the AEWRs put on the wages of non-H-2A workers. For instance, preliminary estimates from a

study in progress suggest that an AEWR freeze could reduce wage growth of non-H-2A farm employees by as much as $500 million per year (Rutledge et al., 2023).

Another option would be to cap the growth of the AEWR at a specific percentage so that the growth in the AEWR does not change radically and unpredictably. The FWMA would cap the growth of the AEWR at 3.25% per year until 2032. Preliminary estimates from Rutledge et al. (2023) suggest that a 3.25% cap would save H-2A employers about $75 million per year in direct H-2A labor costs and employers of non-H-2A farmworkers about $170 million per year due to reduced market pressures that spillover from the AEWR into the non-H-2A labor market. As such, an AEWR freeze would give some temporary relief to fresh produce farmers through reduced mandatory wage growth of H-2A employees, as well as secondary market linkages between the H-2A and US-based farm labor markets.

4.2.2 Changing the Data Source or Methodology Used to Calculate the AEWRs

One of the main concerns with the AEWRs has to do with the survey (the FLS) and methodology used to calculate them. Growers who pay wages lower than their state's AEWR have reason to be concerned about flaws in the AEWR's data source and methodology even if the AEWR is not legally binding for their employees. According to former United States Secretary of Agriculture, Sonny Purdue, "The Farm Labor Survey ... was not designed to be used as a source of wage rates for a guest worker program ... " (Florida Growers v. DOL, 2023). Moreover, the FLS has suffered from low response rates in recent years, bringing into question the statistical reliability of the sample of farms that respond to the survey.

To the extent that AEWRs cause employers to raise wages above local market values because they fail to reflect local economic conditions and distort local labor markets, domestic producers are forced to pay higher wages and suffer economic losses. While such a scenario is beneficial for farm employees and may help the DOL to meet its mandate to prevent adverse effects among US-based farm employees, the FLS data and methodological flaws create negative secondary consequences and are reshaping domestic production activities (Rutledge and Taylor, 2019).

There are several shortcomings of the FLS that may cause its hourly wage estimate to miss the mark. First, except for California, Florida, and Hawaii, the survey is conducted at the multi-state region level, and the regional AEWRs are applied to each of the states in the region. However, in each state, there may be a different minimum wage, the production activities may vary, and the cost of living may differ. As such, a wage measure that encompasses multiple states may fail to accurately reflect any one of them. Therefore, a survey that is conducted on a statistically representative sample at the state level would better reflect local market conditions.

Second, the FLS does not produce a measure of the hourly wage rate but, instead, produces a measure of gross hourly earnings. In practice, survey respondents report their total gross wages paid to employees for the reference period and the total number of hours worked, and the average gross hourly earnings of a single employer is calculated by taking the gross earnings paid and dividing by the total number of hours (see Figure 19).

There are at least five shortcomings of the FLS that may cause the FLS to overstate local market wage values. First, the survey includes payments "in kind" in the gross earnings tally, so if a beef

cattle farmer gives each of her employees a side of beef as a bonus at the end of the year, the value of that side of beef is included in the numerator of the calculation. Second, some employees may be salaried employees, so it may be difficult to provide accurate measures of their hours of work. In some cases, their hours may be underestimated (say the employer reports 40 hours per week when the employee actually works 60 hours), which would cause the estimate to overstate the true value. Third, the survey includes H-2A employees in the calculation, so if H-2A employees are paid more than US-based workers in the region, their inclusion in the sample will necessarily cause the AEWR to overstate the local market wage. Fourth, the survey has suffered from low response rates in recent years, and those who respond to the survey are given extra weight in the final calculation. So, if farmers who chose to respond tend to be more prominent businesses that can pay a higher wage, the sample will be skewed. As such, the sample of respondents may not be representative of the average farmer in the sample. And last, employees of farm labor contractors are excluded from the sample, and they tend to be paid less than employees hired directly by farmers, so their exclusion can cause the wage estimates to be too high.

Figure 19. Farm Labor Survey Instructions

Section 1 - Paid Workers for October (continued)

4. In the table below, report all agricultural workers on the payroll during the week of October 8th through October 14th.
   - Report workers under the worker code (provided on page 5) in which they are working, not under the worker code for which they have been trained.
   - Report workers who fall under the same worker code on a single line.
   - Report the total hours and wages paid to the group of workers during the week of October 8th through October 14th.
   - Record each worker only once.
   - If the worker performs work in two or more worker codes, report them under the worker code that requires the highest level of skill. If there is no measurable difference in skill requirements, report workers under the worker code in which they spend the most time.
   - For workers on paid leave, report the number of hours normally worked during the week of October 8th through October 14th.
   - Gross wages are the total amount paid to workers before taxes and other deductions. INCLUDE the worker's share of social security and unemployment insurance, but EXCLUDE the employer's share. INCLUDE in-kind payments (e.g., agricultural product like a side of beef, bushels of grain, etc.) provided in lieu of wages for work done. In-kind payments do NOT INCLUDE benefits such as housing, meals or insurance.

Enter the Worker Code from Page 5	Number of Paid Workers that week	Total Hours Worked that week	Total Gross Wages Paid that week (Dollars)
611	612	613	614

Source: https://www.nass.usda.gov/Publications/Methodology_and_Data_Quality/Farm_Labor/11_2023/ALSReport%20Form_102023.pdf.

While there may be no single solution to address all these shortcomings, some actions could be taken to address some of them. First, increasing the sample size and providing samples that are representative of each state could help overcome the first issue mentioned above. Second, obtaining measures of hourly wages instead of gross hourly earnings would likely produce an estimate that more accurately reflects the purpose of the AEWR. Right now, the AEWR is not even a "wage rate" but is a "gross hourly earnings rate," so it misses the mark that it intends to hit. Third, H-2A employees should not be included in the calculation. If the AEWR is supposed to prevent downward wage pressure for US employees, then foreign employees who are paid the AEWR should not be included in the calculation. Fourth, the samples should be statistically

representative of the population of interest and the response rates should be high enough such that there is little concern about sample selection bias. And last, employees of farm labor contractors should be included in the sample.

If these issues with the FLS methodology are not addressed, then another data source that provides hourly wage estimates of the relevant labor force (i.e., direct hire crop farm employees and employees of crop farm labor contractors) should replace the FLS. The National Agricultural Workers Survey is one alternative data source that could provide a relevant measure, but the sample sizes would likely need to be increased to get representative state-level wage estimates. Removing the occupation specific requirement for the AEWR would also provide some relief.

4.2.3 H-2A Program Subsidies or Tax Credits

Farm employers claim there is a tipping point where higher AEWRs just do not pencil out for their businesses. On the other hand, farm employee advocates have long argued for better pay and working conditions. One solution that could work for both sides is a subsidy or tax credit for employers to help offset higher employment costs while ensuring that employees are paid a fair wage. Options along these lines could include housing reimbursements for H-2A employers, overtime wage tax credits, or tax write offs for certain H-2A expenses, such as transportation or meals.

4.3 Technology Development Policy

If migration policy or H-2A visa program changes are not implemented soon, technology solutions will have to be developed fast or fewer and fewer fruits and vegetables will be grown in the US. These technologies will also have to be efficient enough so that farmers can justify investing in them. As such, the government can play a critical role in promoting the development and adoption of these technologies.

Broadly speaking, the widely held view among economists is that producers adopt new technologies when the expected cost savings from doing so exceed the investment cost (Rutledge and Taylor, 2023). Adoption is only one part of technological change, however, because new technologies need to be developed before adoption can take place.

In a labor-abundant environment, wages tend to be low relative to capital and land rents, so there is little incentive for public and private entities to invest their resources in developing labor-saving technologies. In a labor-scarce environment, rising wages create incentives to develop labor-saving technologies (Rutledge and Taylor, 2023), but in some cases, the market will fail to develop relevant technologies without government assistance. If technological development lags, domestic fruit and vegetable crop production will be more vulnerable to rising wages and declining farm worker availability. Confronted by rising wages and less access to workers, there may be incentives to shift to less labor-intensive crops. If these technologies are not available, labor shortages will put upward pressure on food prices for consumers and create reliance upon imports of fresh produce from countries who have more abundant farm labor resources.

Governments can promote the development and adoption of mechanized labor solutions by providing grant funds to organizations, creating low interest rate loan programs for farmers, or providing other incentives to promote their development, such as tax credits for industry

technology development efforts or purchases.

5. Conclusion

Farm labor shortages in the US are real, their prevalence has increased over time, and there are serious consequences of not resolving this issue. An abundance of evidence reveals that the US-based farm labor supply is declining, putting upward pressure on farm wages and causing fresh produce farmers to change their production practices and the types of crops they grow. At the same time, US fruit and vegetable imports have reached record volumes, which creates new challenges for American farmers. In Mexico, farm wages are 15% of those found in the United States, which means that American farmers paying $25.00 or more per hour for H-2A labor (including housing and other costs) are at a competitive disadvantage to the $2.00 per hour wages in Mexico. While international trade tends to be beneficial from a social welfare standpoint, increased reliance upon foreign countries to produce essential goods like healthy foods creates unnecessary food security risks and places the US at a strategic disadvantage. Maintaining domestic production of fresh fruits and vegetables reduces US national security risk exposure, which could result from major supply chain disruptions or other types of crises.

There are several types of policy options that could help address the farm labor shortage issue and give much needed relief to the US fresh fruit and vegetable industry. These policies are broadly categorized into three groups: migration, changes to the H-2A visa program, and technology development. Some options that fall in these categories include:

- More green cards for farmworkers
- Agricultural sector work authorization for undocumented immigrants
- Freezing or caping the AEWRs
- Changing the data source used to calculate the AEWRs
- Changing the methodology used to calculate the AEWRs
- Removing the occupation specific requirement for the AEWRs
- H-2A visa program subsidies or tax credits
- Low interest loans for farm technology purchases
- Tax offsets for technology development and adoption

In some cases, states may be able to step in and take action, while in other cases, federal laws or regulatory changes would need to be implemented. If US policymakers do not take swift action to address the farm labor shortage crisis, domestic production of high-value fresh produce crops will likely decline. As such, there is an urgent need for policy action to address the labor shortage issue and mitigate the potentially far-reaching ramifications of losing production to foreign competition.

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