

# US Farm Employment and Farm Workers

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## Summary

The average employment of hired workers in US agriculture is about 1.5 million. Farm labor markets are significantly different from most other labor markets, and this article explores some of the key differences. For example, they are spread out over a wide geographic region, and the demand for labor depends upon a number of factors, including weather, wages, and the price of goods in some cases.

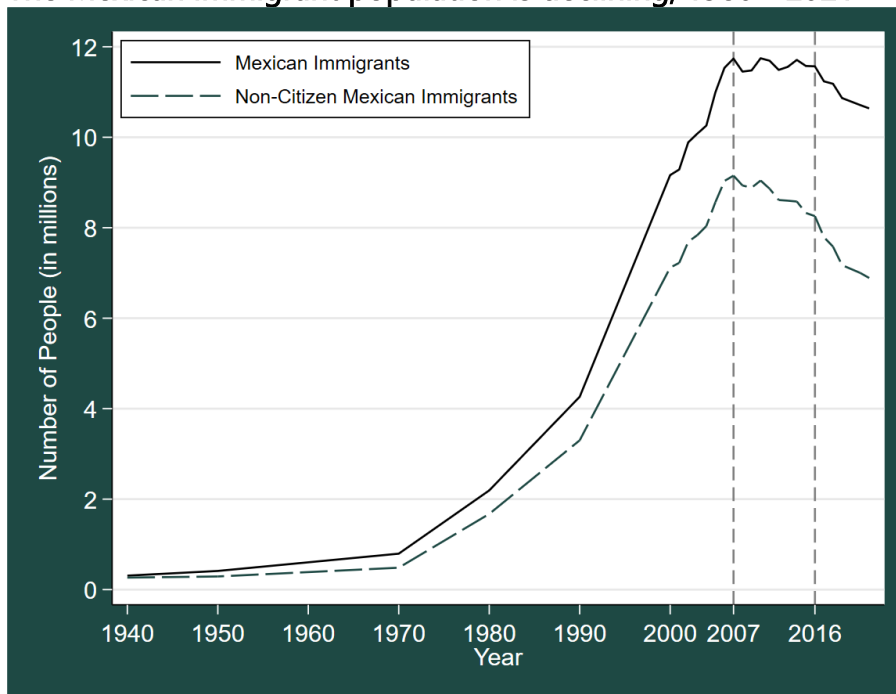
Due to the seasonality of agricultural production and job turnover, some 2.5 million people are employed for wages on US farms sometime during a typical year. The employment of hired farm workers is concentrated in three interrelated ways: by geography, commodity, and size of farm. The 10,000 largest fruit and berry, vegetable and melon, and horticultural specialty (FVH) farms in CA, WA, FL, and TX account for over half of US farm worker employment, including a third in CA.

Two million workers, 80 percent of all farm workers, are employed on crop farms. The National Agricultural Worker Survey (NAWS) finds that 70 percent of non-H-2A guest workers on US crop farms are Mexican-born men who have settled in one US place. Some 60 to percent of these Mexican-born crop workers are unauthorized, making over 40 percent of non-H-2A crop workers unauthorized.<sup>1</sup> Most settled Mexican-born farm workers have US-educated children who shun their parents' seasonal farm jobs. According to US Census data, since the turn of the Great Recession, the non-citizen Mexican immigrant population has been declining, while the total number of Mexican immigrants started declining in 2016.

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<sup>1</sup> If we consider all farm workers, including H-2A guest workers and hired workers employed in animal agriculture, the unauthorized share is lower, between 30 and 40 percent.

## The Mexican immigrant population is declining, 1980 - 2021



Source: US Census and American Community Survey

The farm labor market matches millions of workers with often seasonal jobs. All labor markets perform the R functions of recruitment, remuneration, and retention, but the farm labor market performs these functions differently. Recruitment often relies on farm labor contractors, many workers are remunerated under piece rate wage systems that guarantee a minimum wage but allow fast workers to earn more than this minimum if they pick more trays or bins. Unions have few contracts with US farms and represent few farm workers, but have significant political influence.

Farm worker earnings of about \$17 an hour in 2022 were 60 percent of average nonfarm earnings of \$28, reflecting the rapid growth in farm worker earnings since 2015 that has narrowed the farm-nonfarm wage gap. Reasons for the narrowing farm-nonfarm wage-gap include a stable demand and a shrinking supply of farm workers, states raising their minimum wages and requiring overtime pay for farm workers, and more employers turning to H-2A guest workers who must be paid a higher Adverse Effect Wage Rate.

There have been significant organizing efforts to help the largely immigrant farm workforce overcome economic disparities and exploitation. While these efforts gained significant momentum in the latter half of the 1900s, some of them have waned since then, such as membership in unions. However, new farm labor advocacy efforts have emerged.

In light of rising farm labor costs, there is now a race in the fields between labor-saving machines, H-2A guest workers, and imports. Adjustments to rising labor costs vary by commodity. Some commodities seem poised to remain in the US and mechanize, including raisin and wine grapes as well as blueberries. Commodities such as apples and strawberries are likely to utilize more H-2A guest workers until mechanization is perfected. Imports of commodities such as fresh tomatoes and raspberries from lower wage countries are likely to increase as US production shrinks.

### **Key Farm Labor Data Sources**

There are several sources of data on hired workers in US agriculture. The main data sources are the Quarterly Census of Employment and Wages (QCEW), the Farm Labor Survey (FLS), the Current Population Survey (CPS), and the National Agricultural Workers Survey (NAWS). In each data set, the definition of farm worker and survey reliability vary, making the farm labor market akin to a room of unknown size and shape. Each data source opens a window into the room that varies in size and clarity or reliability. There are shortcomings and advantages to each of the datasets, which are provided more depth Hertz and Zahniser (2012).

For example, the QCEW and FLS only provide aggregate measures of employment and wages and do not contain any information on the individual farm employees. The QCEW is an administrative dataset and captures employment and earnings data from all employers whose employees qualify for unemployment insurance, including both direct hire employees and employees of farm labor contractors. H-2A employees in some states, such as Michigan and Florida, do not qualify for UI payments, so they are excluded, while states like California include H-2A employees. As such, the QCEW only reflects non-H-2A employees in some states but reflects both H-2A and non-H-2A employees in other states. Moreover, the QCEW does not provide any details about the hourly wage rate that is paid to employees.

The FLS is a survey of crop and animal farmers but does not include employees who work for farm labor contractors. 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). The FLS does, however, provide a measure of the gross hourly earnings of employees, which includes payments in kind, such as a side of beef, so it does not necessarily reflect the average hourly wage of farm employees. The FLS also includes H-2A visa employees in the wage and employment measures and does not focus entirely on US-based employees. The FLS has suffered from low response rates in recent years, creating concerns about its statistical reliability.

The CPS samples households in the US and gathers information on each member of every sampled household. The CPS uses a 4-8-4 rotation, where people are surveyed for 4 consecutive months, they exit the sample for 8 months, and then enter the sample for another 4 months. During the months when the respondents exit the sample (in their 4th and 8th months they respond), they are asked additional questions pertaining to their earnings. The CPS collects demographic data, such as birthplace and gender, and provides data on hourly wages. However, the CPS has relatively small farm employee sample sizes (about 700 per year) to provide any geographically-representative statistics. The CPS provides weights that allow for estimates of the total workforce.

The NAWS is a nationally and regionally representative data set that provide representative statistics at 6 publicly available regions and 12 restricted-access regions for individuals with access to confidential data. According to the US Department of Labor (DOL), "The primary purposes of the NAWS are to monitor the terms and conditions of agricultural employment and describe the demographic characteristics of hired crop workers...NAWS findings have been used for occupational injury and health surveillance, estimating the number and characteristics of crop workers and their dependents, and program planning." The NAWS collects hourly wage data and collects information on a wealth of other categories, including demographics and some types of sensitive data, such as undocumented status. The NAWS fills many of the gaps in terms of the statistical reliability of individual-level characteristics, but it does not permit estimates of the total labor force. As such, the NAWS provides some information about marginalized farm employees that other data sources do not provide.

## Employment

The Bureau of Labor Statistics (BLS), which uses data from the CPS described above to estimate the number of workers, reported average employment of 850,000 self-employed farmers and unpaid family members and 1.5 million wage and salary workers in 2016. The average employment of farmers and family members declined by five percent between 2006 and 2016, while the average employment of hired workers rose by 23 percent. BLS projects stable hired worker employment through 2026, meaning that hired workers will continue to account for two-thirds of average employment in US agriculture.

### Hired farm workers account for two-thirds of average employment in US agriculture

Sector	2006	2016	2026	Change	
				2006-16	2016-26
Ag wage & salary	1,219	1,501	1,518	23%	1%
Ag self-employed	893	850	828	-5%	-3%
Total ag	2,112	2,351	2,346	11%	0%
Hired share	58%	64%	65%		

Source: US Bureau of Labor Statistics, Table 1  
<https://www.bls.gov/opub/mlr/2017/article/projections-overview-and-highlights-2016-26.htm>

BLS estimated that 452,490 hired workers were employed in farming occupations in May 2021, and that they earned a median \$14 and a mean \$17 an hour. The largest group were in SOC 45-2092, crop, nursery, and greenhouse workers, which had employment of 277,200, median hourly wages of \$14.25, and mean hourly wages \$15.11.

### Over 60% of the workers with farming occupations in 2021 were crop workers

Occupation code	Occupation title (click on the occupation title to view its profile)	Level	Employment	Employment RSE	Employment per 1,000 jobs	Median hourly wage	Mean hourly wage	Annual mean wage	Mean wage RSE
<b>45-0000</b>	<b><a href="#">Farming, Fishing, and Forestry Occupations</a></b>	major	452,490	0.8%	3.212	\$14.36	\$16.70	\$34,730	0.7%
45-1011	<a href="#">First-Line Supervisors of Farming, Fishing, and Forestry Workers</a>	detail	25,770	2.7%	0.183	\$23.38	\$26.18	\$54,450	0.9%
45-2000	Agricultural Workers	minor	383,760	0.8%	2.724	\$14.27	\$15.60	\$32,450	0.6%
45-2011	<a href="#">Agricultural Inspectors</a>	detail	13,630	2.7%	0.097	\$21.70	\$22.80	\$47,430	0.8%
45-2021	<a href="#">Animal Breeders</a>	detail	950	12.2%	0.007	\$19.28	\$20.81	\$43,270	4.0%
45-2041	<a href="#">Graders and Sorters, Agricultural Products</a>	detail	25,560	4.7%	0.181	\$14.25	\$14.62	\$30,400	0.7%
45-2090	Miscellaneous Agricultural Workers	broad	343,630	0.9%	2.439	\$14.27	\$15.37	\$31,980	0.7%
45-2091	<a href="#">Agricultural Equipment Operators</a>	detail	26,180	3.3%	0.186	\$17.48	\$17.44	\$36,280	0.9%
45-2092	<a href="#">Farmworkers and Laborers, Crop, Nursery, and Greenhouse</a>	detail	277,200	1.0%	1.968	\$14.25	\$15.11	\$31,440	0.7%
45-2093	<a href="#">Farmworkers, Farm, Ranch, and Aquacultural Animals</a>	detail	34,140	2.6%	0.242	\$14.25	\$15.46	\$32,150	0.9%
45-2099	<a href="#">Agricultural Workers, All Other</a>	detail	6,100	7.4%	0.043	\$15.65	\$17.88	\$37,190	2.5%

[https://www.bls.gov/oes/current/oes\\_nat.htm#45-0000](https://www.bls.gov/oes/current/oes_nat.htm#45-0000)

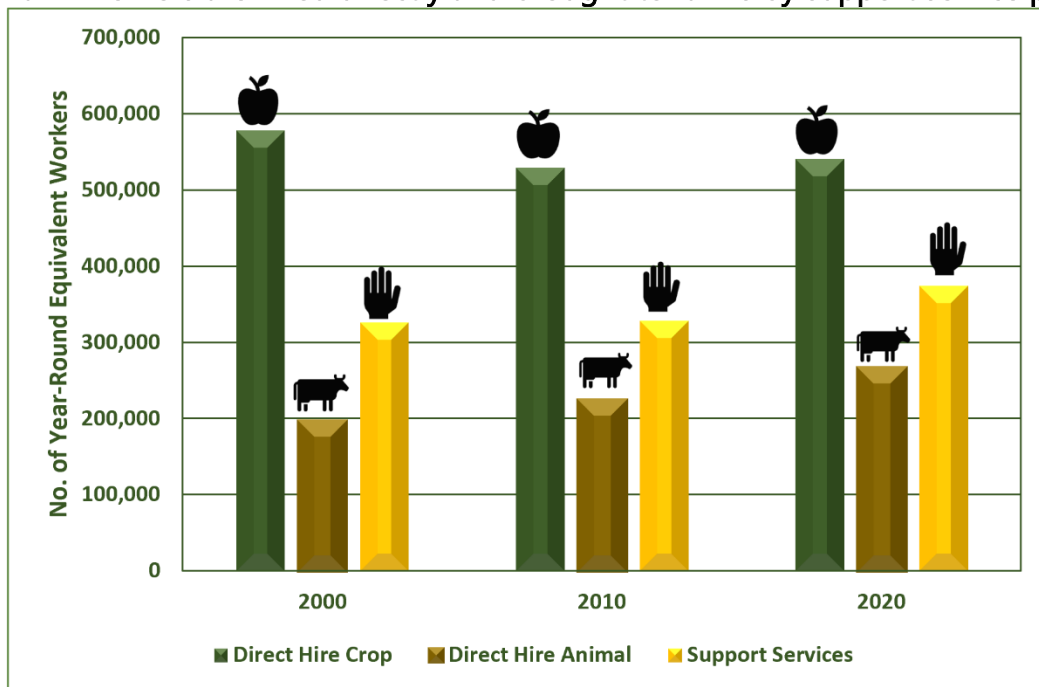
The most comprehensive data on hired workers is employer data from the QCEW ([www.bls.gov/cew](http://www.bls.gov/cew)) collected when employers who pay taxes that provide unemployment insurance benefits to laid-off workers. Employers report all of their employees who are on the payroll for the pay period that includes the 12<sup>th</sup> of the month, and all of the wages paid to all of the workers they employed, including those who are employed only in other payroll periods or weeks of the month (most farm

payrolls are weekly). The QCEW data are a measure of average employment or year-round equivalent jobs, not the number of unique farm workers.

Some 104,445 US agricultural employers (NAICS 11) paid \$43.5 billion to an average 1.3 million workers in 2017, up from 95,346 US agricultural employers who paid \$30.4 billion to an average 1.2 million workers in 2008.<sup>2</sup> The QCEW data exclude workers who are employed on smaller farms and H-2A workers in some states, making total average agricultural employment about 1.5 million.

The QCEW divides farming into three major subsectors, direct hire crop agriculture, direct hire animal agriculture, and crop support services, which includes employees of farm labor contractors (FLCs). Crop agriculture and crop support services account for three-fourths of US farm employment and an even higher share of seasonal workers. Average crop and crop support employment has been relatively stable at 1.1 million over the past two decades, but a rising share of workers, 40 percent in 2020, were brought to farms by nonfarm crop support employers (NAICS 1151), and over half of this employment is with farm labor contractors. About 80 percent of crop employment is covered by unemployment insurance.

**Farm workers are hired directly and brought to farms by support service providers**

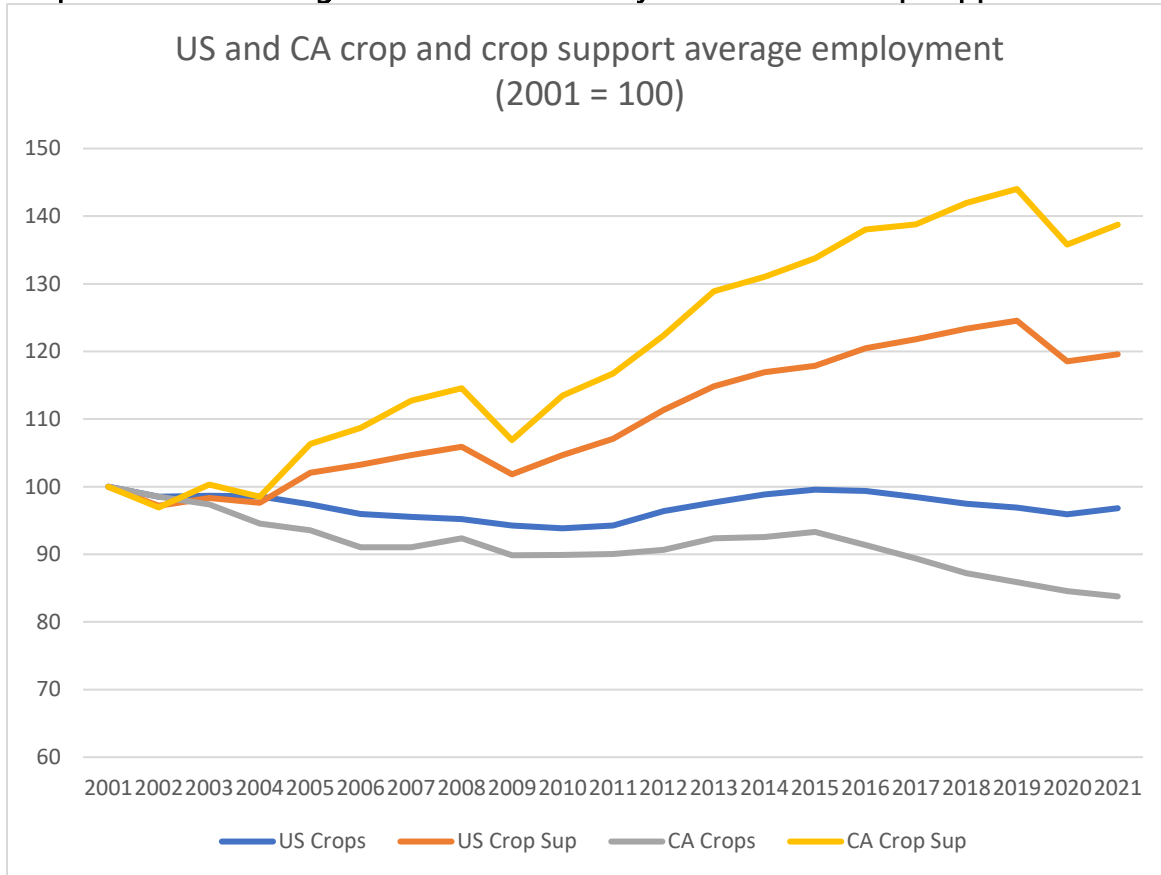


Source: QCEW [QCEW Data Files](https://www.bls.gov/qcew/) : U.S. Bureau of Labor Statistics (bls.gov)

<sup>2</sup> The acronym “NAICS” refers to the North American Industry Classification System.

Employment in US crop agriculture is 60 percent direct hire and 40 percent crop support. In California the ratio is reversed: 60 percent of average employment involves workers who are brought to crop farms by crop support employers and 40 percent reflects workers who are hired directly.

**Crop farmers are hiring fewer workers directly and more via crop support firms**



Source: Author calculations from QCEW.  
<https://migration.ucdavis.edu/rmn/blog/post/?id=2800>

Labor-intensive FVH crops are different from field crops such as corn or wheat in many ways. The 10 largest lettuce or mushroom growers, or the five largest marketers of avocados and berries, often supply a commodity year-round to supermarkets and food service firms by operating or purchasing in multiple locations. The 10 largest farms or marketers may account for half or more of total production or sales of a particular commodity.

For example, the 2017 Census of Agriculture (COA) reported 25,000 US apple farms, but the largest 800 or three percent each had 100 or more acres of apples and collectively accounted for over 70 percent of US apple acreage; the 1,000 apple farms that each had



sales of \$1 million or more accounted for two-thirds of US apple acreage. The COA reported over 1,100 lettuce farms, but the largest 67 or six percent that each harvested 1,000 or more acres accounted for over 80 percent of harvested lettuce acreage.

This means that the production and marketing of many fresh fruits and vegetables is dominated by dozens of growers and marketers rather than tens of thousands, as with producers of corn or soybeans. Many fruit, vegetable, and horticultural (FVH) commodities are concentrated in particular areas, as with fresh apples in WA and leafy greens such as lettuce in CA and AZ.

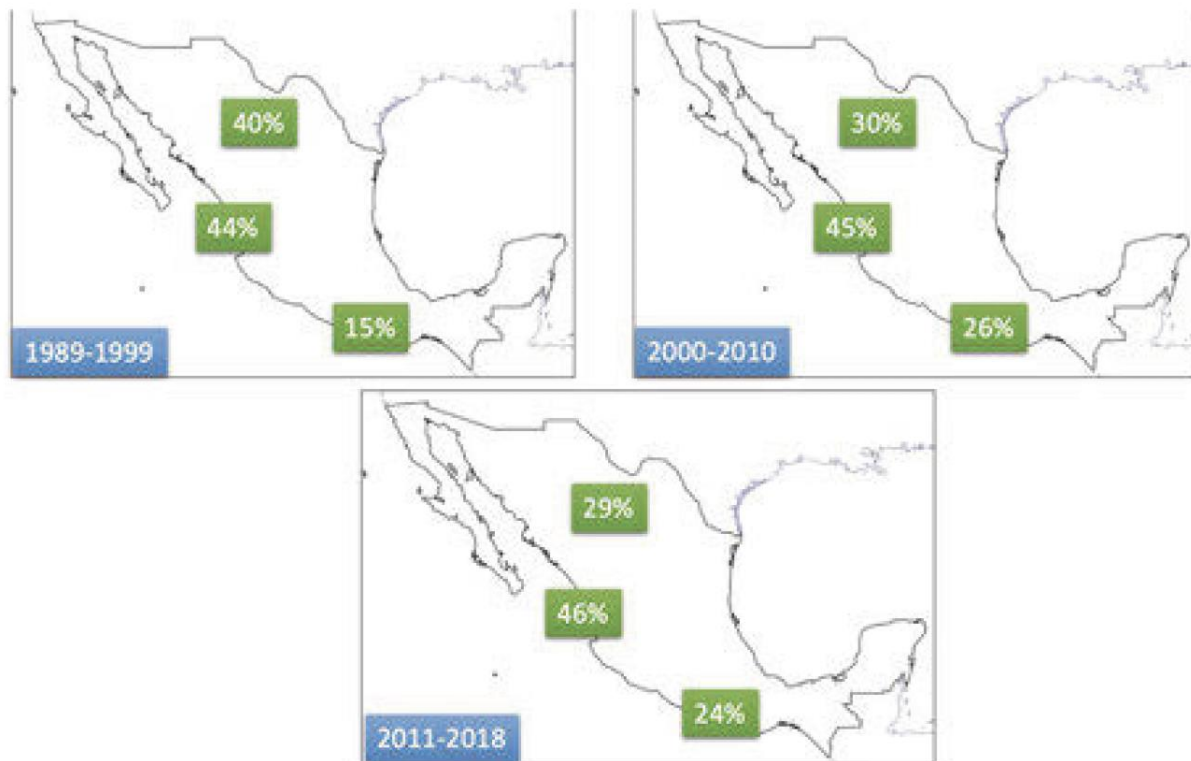
### **Farm Workers**

The NAWS has been interviewing 1,500 to 3,000 non-H-2A workers employed on US crop farms each year since 1989, and finds that, on average, crop workers are aging, settled in one place, and working 200 days a year for one farm employer. H-2A guest workers, who are not interviewed in the NAWS, are younger, male, and almost 95 percent Mexican. There are no reliable data on who works in animal agriculture, but most observers believe that livestock workers are older and less Hispanic than crop workers.

### **NAWS Demographics**

The NAWS finds that two-thirds of crop workers were born abroad, almost all in Mexico, including half from west-central Mexican states such as Jalisco and Michoacán, 30 percent from northern states such as Sinaloa, and a quarter from in southern Mexican states such as Oaxaca. There is a declining share of US farm workers from northern Mexican states and a rising share from southern Mexican states.

### **More Mexican-born farm workers are from southern Mexican states**

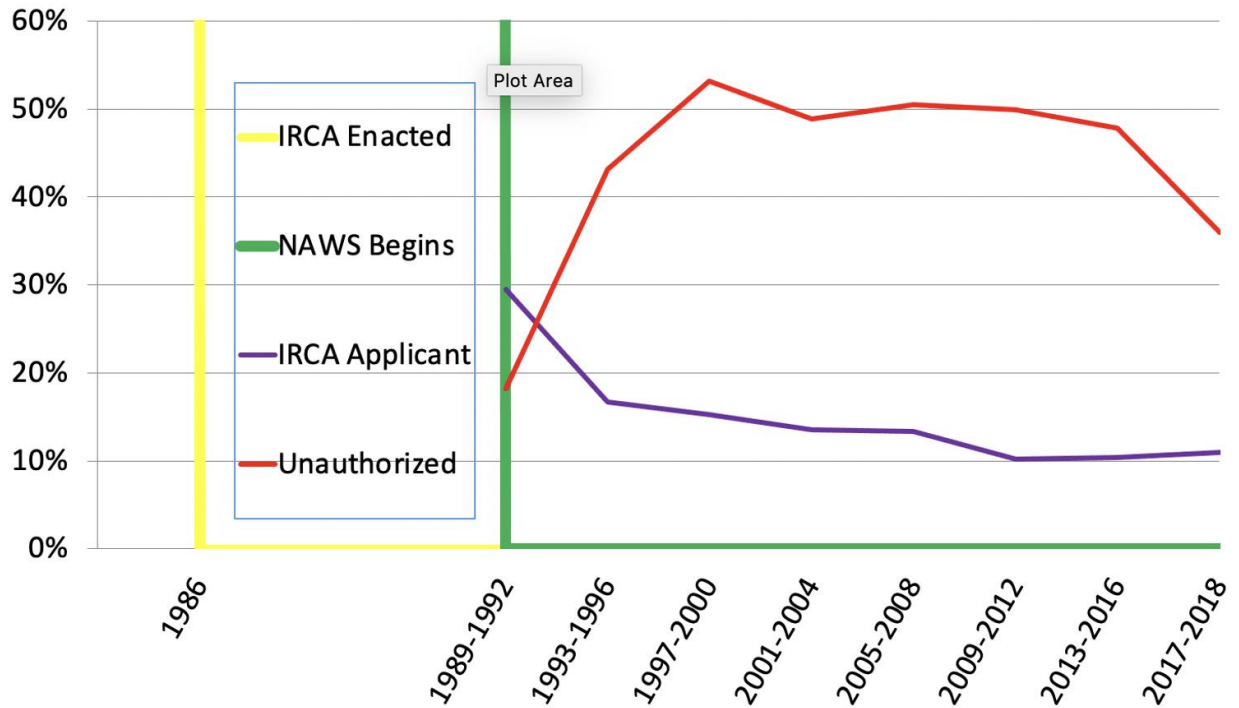


Source: NAWS <https://migration.ucdavis.edu/rmn/blog/post/?id=2643>

Many key farm worker characteristics peaked between 1998 and 2000 when unauthorized Mexico-US migration was highest. One of the most cited NAWS data points is the share of crop workers who are legally authorized to work in the US. Some 86 percent of crop workers were authorized in 1991, just after 1.1 million unauthorized foreigners were legalized under IRCA's Special Agricultural Workers program in 1987-88.

During the 1990s, these legalized SAWS moved out of agriculture and were replaced by unauthorized newcomers from Mexico, so that over half of US crop workers were unauthorized by 2000. The share of unauthorized workers remained at 50 percent until 2015 and declined to a third in 2017-18 before rebounding. If the 250,000 H-2A guest workers were included, the unauthorized share of crop workers would drop to 25 to 35 percent.

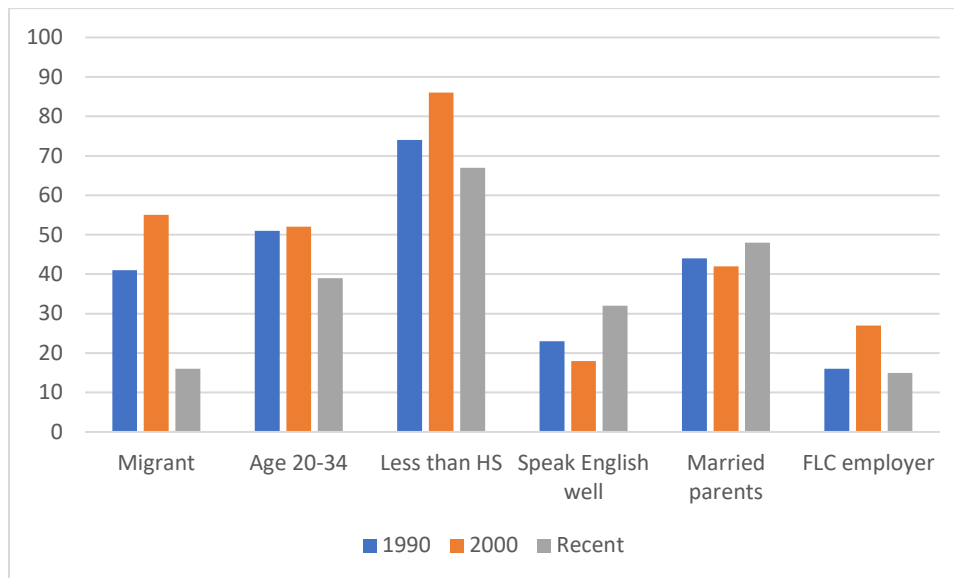
## The share of unauthorized crop workers rose to over half in the mid-1990s



Source: NAWS <https://migration.ucdavis.edu/rmn/blog/post/?id=2643>

The average age of crop workers in 2017-18 was 40, and ranged from a low of 36 for US-born crop workers to a high of 57 for SAWs who were legalized in 1987-88. The SAWs who are still in the crop workforce have an average 35 years of US farm work experience, suggesting that they began to do US farm work when they were 22.

## The share of crop workers who were migrants peaked in 2000 at 55 percent



Source: NAWS

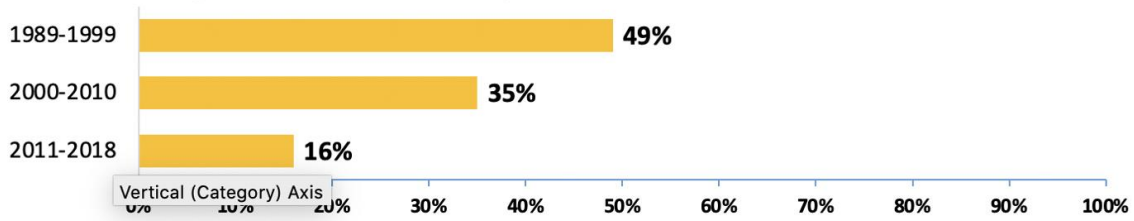
The fresh blood in the crop workforce until 2008-09 were young and unauthorized Mexican newcomers who were interviewed within a year of arriving in the US. At their peak in 2000, unauthorized newcomers were almost a quarter of all crop workers. Since 2010, newcomers have been less than two percent of crop workers, helping to explain why there are now more settled crop workers over 60 than under 20.

Crop workers have little schooling, an average of nine years. Some 40 percent of crop workers had less than seven years of schooling, a quarter had 7 to 9 years, and another quarter had 10 to 12 years. A seventh of crop workers had at least one year of post-secondary schooling. Half of crop workers are parents, a third are single, and 20 percent are married without children.

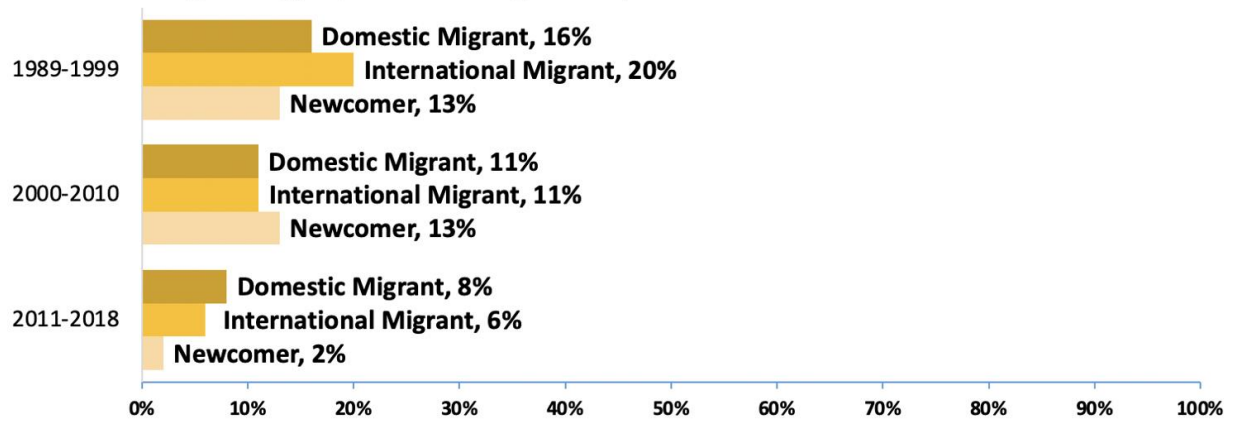
The NAWS defines migrants as workers who travel at least 75 miles from their usual homes to work on crop farms. Most farm workers are not migrants, and the migrant share of the crop workforce declined to 16 percent in 2017-18 (Fan et al., 2015). Among the crop workers who migrate, half move at least 75 miles within the US to do farm work while the other half are mostly US immigrants who travel between Mexican homes and US jobs.

1/6 of US crop workers are migrants, and half of these migrants move at least 75 miles from a US home to a crop farm job

**Migrant as Share of All Crop Workers**

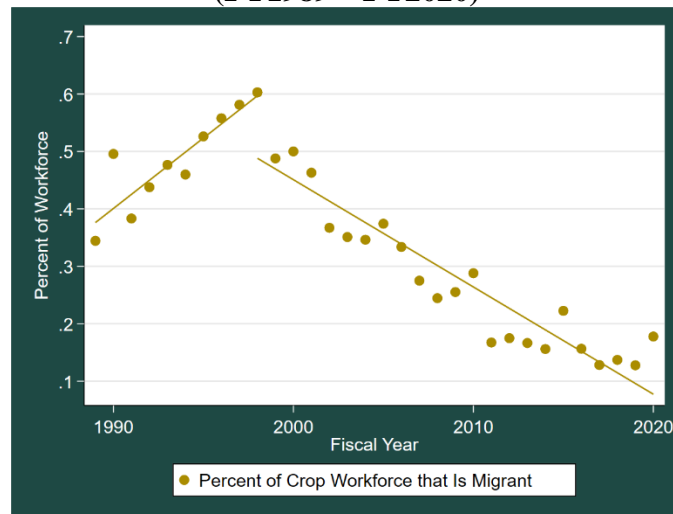


**Migrant Types, Share Among All Crop Workers**



Source: NAWS <https://migration.ucdavis.edu/rmn/blog/post/?id=2643>

**Percentage of US-Based Crop Farmworkers Who Are Migrants (FY1989 – FY2020)**



Farm work has often been associated with poverty. The NAWS collects income data in ranges, and found that the median personal income of crop workers was \$20,000 to \$25,000 a year or about \$2,000 a month in 2018, double the \$12,140 poverty line for an individual. Median family income was \$25,000 to \$30,000, also above the poverty line of \$25,140 for a family of four in 2018. Poverty is more common among farm workers than all US residents, and 20 percent of farm worker families have incomes below the poverty line, compared with 14 percent of all US families.

There was more continuity than change in many demographic characteristics of crop workers over the past three decades:

- The share of men was 77 percent between 1989 and 1999, 78 percent in the 2000-10 decade, and 69 percent since 2010, signifying a slightly rising share of female farm workers
- The share of crop workers born in Mexico was 65 percent between 1989 and 1999, 71 percent in the 2000-10 decade, and 66 percent since 2010
- The mean years of schooling were seven, eight, and nine, rising a year each decade. Among workers born in Mexico, mean years of schooling were six, six, and seven, while US-born had a mean 10, 11, and 12 years of schooling.
- The share of crop workers who were parents with children was 47, 51, and 53 percent in the 1990s, 2000s, and since 2010, respectively

### **NAWS Employment**

The NAWS portrays a settled and experienced crop workforce. Since 2000, over 80 percent of crop workers reported that they had only one farm employer in the past year, while one percent reported four or more employers.

Farm work for most workers is like nonfarm work. This means that over 90 percent of crop workers live off the farm where they work and commute by car or car pool; less than 10 percent walk to work, suggesting that they live on the farm where they work. Workers averaged 198 days of crop work a year since 2000, when the average was 150 days a year; 2000 was a peak year for newcomers who had just entered the US and thus did not accumulate many days of farm work.

Crop workers had an average 16 years of farm work experience in 2017-18, suggesting that most began to do farm work before they were 25. Almost 90 percent of crop workers were employed directly, and over 90 percent were paid hourly wages or received salaries; seven percent received only piece rate wages. Workers were employed by their current employer an average of eight years. Almost a quarter of crop workers had at least one non-crop job, and over 80 percent plan to continue to do farm work for at least five more years.

Changes in employment over the past three decades reflect less Mexico-US migration:

- The average years of farm work experience for workers with at least a year of US farm work rose from 12 in the 1990s to 14 in the 2000s and to 17 since 2010
- Average years with the current employer rose from four to five to seven over the past three decades
- The share of workers hired directly has been rising: 80 percent in the 1990s, 83 percent in the 2000s, and 86 percent since 2010
- The share of workers paid only piece rate wages has been falling, 20 percent in the 1990s, 13 percent in the 2000s, and eight percent since 2010
- The share of workers who walk to work, suggesting that they live on the farm where they work, was seven percent in the 1990s, eight percent in the 2000s, and seven percent recently. The share of workers who drive to work rose steadily, from 40 to 45 to 63 percent in each decade.
- The average days of farm work rose significantly, from 144 to 182 to 198 in the 1990s, 2000s, and since 2010, respectively
- The share of workers with only one farm employer during the previous year was 59, 77, and 81 percent.
- The share of workers who plan to continue doing farm work for five or more years rose from half to 80 percent.

The NAWS interviews workers employed on three major types of farms. Over 41 percent of workers interviewed in 2017-18 were employed on fruit farms, 22 percent were employed on horticultural specialty farms such as nurseries, and 20 percent were employed on vegetable farms. The most frequent task of interviewed workers was semi-skilled such as equipment operator, 34 percent of workers interviewed in 2017-18, followed by harvesting, 24 percent, pre-harvest activities, 23 percent, and post-harvest activities, 19 percent.

40% of crop workers were employed in fruits and nuts in 2017-18, and a quarter of all crop workers had harvesting jobs

**Figure 5.1: Primary Crop at Time of Interview, 2017–2018**

Crop at Time of Interview	All Farmworkers	Employed by Grower	Employed by Farm		
			Labor Contractor	Migrant Farmworkers	Settled Farmworkers
<b>Fruits and Nuts</b>	41%	38%	67%	54%	39%
<b>Horticulture</b>	22%	25%	<sup>a</sup>	11% <sup>b</sup>	24%
<b>Vegetables</b>	20%	21%	16% <sup>b</sup>	19%	21%
<b>Field Crops</b>	13%	15%	<sup>a</sup>	7%	14%
<b>Miscellaneous/ Multiple</b>	4% <sup>b</sup>	2%	<sup>a</sup>	9%	2%

**Figure 5.2: Primary Task at Time of Interview, 2017–2018**

Primary Task at Time of Interview	All Farmworkers	Employed by Grower	Employed by Farm		
			Labor Contractor	Migrant Farmworkers	Settled Farmworkers
<b>Pre-harvest</b>	23%	24%	18% <sup>a</sup>	17%	24%
<b>Harvest</b>	24%	21%	45%	42%	21%
<b>Post-harvest</b>	19%	20%	11% <sup>a</sup>	12%	20%
<b>Technical Production</b>	34%	35%	27%	29%	35%

Source: NAWS

The fact that almost 90 percent of workers are hired directly, and that three-fourths are not harvesting when interviewed, may reflect the NAWS practice of interviewing workers year-round rather than during peak harvest periods. The harvesting of many commodities occurs over short time periods, so that a smaller share of harvest than non-harvest workers may be interviewed. A survey conducted during peak harvest periods would likely find more workers who are brought to farms by farm labor contractors and more workers paid piece rates, since many harvesting jobs pay piece rate wages. These piece rate harvesting jobs are where the H-2A program is expanding fastest.

### Farm Labor Markets

Labor markets are exchanges where employers find workers and workers find jobs. These exchanges can be physical, as when workers wait outside home improvement stores to be hired by contractors, when people visit job fairs, or virtual, as when applicants review job offers online and apply. Workers search for jobs and employers screen applicants, employers motivate their employees to work and seek to retain the best workers, functions often summarized as the three Rs of labor markets: recruitment



or matching workers with jobs, remuneration or paying wages and benefits to motivate workers to provide effort in exchange for reward, and retention to retain experienced workers.<sup>3</sup> Each of these three Rs operates differently in farm labor markets relative to most other sectors of the economy.

## **Recruitment**

Most nonfarm employers develop job descriptions that lay out the qualifications required to perform a job, advertise for candidates, and screen and interview applicants to find the best person to fill a particular job. Farmers often use job ads and interviews to recruit skilled and professional workers, but rarely to recruit seasonal farm workers unless they are hiring H-2A guest workers, where ads seeking US workers are required. Farmers often hire groups of workers, asking for a crew of 20 to 40 workers.

Crews of Spanish-speaking seasonal workers are matched with farm jobs by bilingual intermediaries, a crew boss employed by the farmer or an independent FLC. Recruitment often occurs through social networks, with incumbent workers asked to bring their friends and relatives into the crew. Many crews include families from the supervisor's Mexican hometown, which may ensure loyalty. Dissatisfied workers usually find it easier to exit the job by switching to another crew rather than voicing complaints about a supervisor who favors or harasses particular workers.

Farm labor contractors are nonfarm businesses that bring workers to farms. Data on FLCs are murky because federal and state laws require many people involved in recruiting, transporting, and supervising farm workers to obtain licenses, while unemployment insurance laws record only FLC establishments that pay UI taxes. For example, California has 1,500 UI-registered FLC establishments but almost 10,000 licensed FLCs and FLC employees.

FLCs should benefit both employers and workers, but often benefit mostly employers. A farmer who needs workers seasonally, and workers who need several seasonal jobs to achieve sufficient earnings, can each pay small fees to the FLCs who match workers and jobs. In practice, FLCs have long been associated with labor market problems rather than efficiencies, an example of fissuring the workplace in ways that disadvantage vulnerable workers (Fisher, 1953; Weil, 2014).

FLCs compete with each other to win work for their employees on farms, and farm operators sometimes ask FLCs to lower their commissions in order to win their business.

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<sup>3</sup> The worker side of these 3 Rs are job search, reservation wages and effort on the job, and quits and turnover, worker willingness to leave one job to find another.

Commissions are a sensitive and opaque topic. There are many arrangements to get farm work done, from paying a fixed price per acre or ton to harvest a crop to paying an hourly wage to workers and an overhead or commission to the FLC. FLC commissions cover non-wage costs, including payroll taxes and business costs that range from recruitment to toilets and equipment as well as profits, and are typically 30 to 40 percent of FLC revenue, with workers compensation insurance costs of 15 to 20 percent of revenue often the largest single FLC cost.

A farm with a \$10 million wage bill knows that each one percent FLC commission is \$100,000. An FLC who wants a 40 percent commission, but is offered 38 percent, must decide whether to accept the lower commission to provide jobs for employees while covering costs and generating profits. Farm operators are often in a stronger economic position than FLCs, encouraging some FLCs to accept lower commissions and compensate by underpaying workers or not paying all required social security and unemployment insurance taxes or workers compensation premiums. Media reports regularly describe FLCs who accept low commissions and employees or government agencies to keep their businesses viable.

There is no database of FLC commissions, so there is no easy way to analyze data to determine the relationship between commissions and labor law violations. On the other hand, there are certification efforts to help lawful or good FLCs to identify themselves to farmers seeking good FLCs. Stronger Together, the Equitable Food Initiative, and other NGOs train and certify FLCs who satisfy their standards under the theory that employers want good FLCs and can now find them more easily.<sup>4</sup>

### **Remuneration**

Work is the exchange of effort for reward, and remuneration is the wage paid to motivate workers to perform their jobs. Most jobs pay hourly wages or monthly salaries, and managers assess the speed and quality of each employee's performance to ensure "an honest day's work for an honest wage." The labor market is unusual because of there is continuous interaction between employers and employees. Workers risk being fired for poor performance, while employers risk having workers quit to pursue other options.

The major challenge in hourly or monthly wage system is to minimize shirking by monitoring the quantity of work performed. Agriculture is different. Farmers in the past

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<sup>4</sup> These NGOs have web sites outlining requirements for certification and the advantages for those who are certified: <https://www.stronger2gether.org/us/> and <http://www.equitablefood.org/>

hired everyone who wanted to pick apples or peaches including children, and they developed a wage system that made the cost of getting work done predictable with a diverse workforce. A piece rate or incentive wage system means that the cost of getting a bin of apples picked is \$30 whether workers are fast or slow. However, a fast picker may pick four bins a day and earn \$120 or \$15 an hour, while a slower picker may pick three bins and earn \$11.25 an hour. Piece rate wage systems feature predictable costs for employers and variable earnings for workers.

Hourly wage systems are common when workers are homogeneous or of similar productivity and employers can control the speed of the work, as when employers can control the speed of machine that travels in front of lettuce harvesters and fire those unable to keep up. Similarly, a working supervisor can set the pace of work for a crew weeding a field. Hourly wages are becoming more common for reasons that range from labor laws that prevent children from doing farm work, minimum wage laws that require employers to “make up” the piece rate earnings of slower piece rate pickers to the minimum wage, and machines that set the pace of work.<sup>5</sup>

Piece rate wage systems remain the norm when it is hard to monitor the speed of work but easy to measure the amount of work performed, such as bins of apples and oranges picked. Employers set piece rates so that the average worker earns more than the minimum wage, giving workers an incentive to work fast. Most tree fruits, berries, and vegetables such as tomatoes are picked under piece rate wage systems, and supervisors monitor the quality of the work to ensure that workers do not include branches or dirt clods in bins and buckets to fill them faster.

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<sup>5</sup> Two 2013 California appellate court decisions, *Gonzalez v. Downtown LA Motors* and *Bluford v. Safeway Stores*, encouraged many employers to switch from piece rate to hourly wage systems. *Gonzalez* held that workers who are paid piece-rate wages must be paid at least the minimum wage when not they are doing piece rate work, while *Bluford* held that employees who are paid piece-rate wages must be paid for the rest periods required by law at their average piece rate earnings. Most piece-rate workers earn more than the minimum wage and, before these decisions, many employers did not pay piece rate workers for waiting and rest time. See <https://migration.ucdavis.edu/rmn/more.php?id=1939>

Piece rate wages are paid when it is hard to monitor effort but easy to monitor output



Source: PLM

The combination of a government-set minimum wage and an employer-set piece rate wage creates a minimum productivity standard. If the minimum wage is \$15 an hour and the piece rate for picking cherries is \$0.20 a pound, workers must pick at least 75 pounds an hour to earn \$15. A worker who picks only 50 pounds an hour would earn \$10, and the employer would have to “make up” or add \$5 to the worker’s earnings or fire the worker for poor performance.

What if the minimum wage increases but piece rates remain stable? Suppose the minimum wage is \$15 an hour and the piece rate for picking a bin of apples is \$30, so that a worker who picks six bins in an eight hour day earns \$180 or \$22.50 an hour and a worker who picks four bins earns \$120 or \$15 an hour. If the minimum wage rises 10 percent to \$16.50 or \$132 in eight hours, but the piece rate remains at \$30, the fast picker still earns more than the minimum wage, but the slower picker earns less and could be terminated. If minimum wages increase and piece rates remain stable, older and slower workers can be squeezed out of the workforce.

Most farm workers earn the minimum wage or slightly more, and some are employed long hours, especially during peak seasons. The federal Fair Labor Standards Act (FLSA)

requires most private sector employers to pay 1.5 times the usual wage after eight hours of work in a day and 40 hours in a week, but the FLSA exempts agriculture, an example of the agricultural exceptionalism in many federal labor laws.<sup>6</sup> California and five other states require overtime wages for farm workers, including on the same 8/40 basis as nonfarm workers in California.<sup>7</sup> Farm employers generally oppose overtime pay, arguing that agriculture is different from nonfarm industries and that seasonal workers want to maximize their earnings when work is available.

Three types of workers typically work more than eight hours a day or 40 hours a week: livestock (dairy) workers, irrigators, and equipment operators. Requiring overtime pay means that employers must weigh the additional cost of hiring and training more workers versus paying overtime wages to current employees. In some cases, overtime pay is cheaper, especially when employers report difficulty finding workers and their employees operate expensive equipment.

### **Retention**

Retention, the third key function of labor markets, is also different in agriculture. Some workers are employed by one employer for their entire career, as with a worker who is employed year-round on a dairy farm, while others may have several employers a year and dozens over their farm work career.

Agriculture offers both year-round and seasonal jobs, and farm operators hire workers directly and indirectly via contractors. Farmers sometimes hire year-round workers directly and offer them housing and other benefits. Seasonal worker policies are different. Most seasonal workers are on the farm only a few weeks or months, making retention a question of how to keep them until work is completed and how to induce them to return next season.

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<sup>6</sup> Farm workers who are employed on farms that used fewer than 500 man days of labor in any quarter of the preceding year are exempt from the federal minimum wage, and all farm workers are exempt from federal overtime pay requirements. The FLSA allows youth 16 and older to work in any farm job anytime, and those 12 and older to work in non-hazardous farm jobs outside of school hours with the consent of their parents.

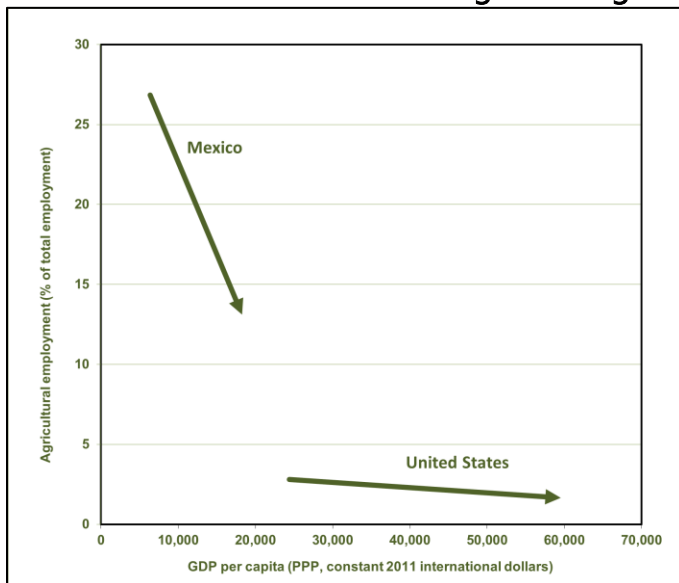
<sup>7</sup> AB 1066, the Phase-In Overtime for Agricultural Workers Act, that requires overtime pay for California farm workers on larger farms after eight hours a day or 40 a week beginning in 2022. The other states that require overtime for farm workers usually require 1.5 times pay only after exceeding 40 hours a week. For example, New York requires overtime pay for farm workers after 60 hours a week in 2024 and 40 hours a week in 2032.

<http://migration.ucdavis.edu/rmn/more.php?id=1995>

The crew supervisors who hire and monitor seasonal workers also lay them off at the end of the season. Many farms have payroll systems that allow them to identify the most productive workers, but few acknowledge such workers in any public way at the end of the season or promise to rehire them next season. One description of typical attitudes to obtain seasonal farm workers uses the analogy of ensuring sufficient irrigation water, where farmers can work collectively to build more dams to maximize the supply of water available to all rather than investing individually in drip irrigation systems to stretch limited water supplies on their farms. Similarly, farmers often work collectively to maximize the pool of seasonal workers available to agriculture rather than investing in their own workforces.

Selecting guest workers from lower wage countries is the ultimate way to maximize the supply of seasonal workers. Mexican workers earn at least 10 times more in US than Mexican agriculture, ensuing that there are more workers seeking H-2A jobs than are available. Farmers invest significant sums to persuade Congress to give them easier access to farm guest workers, just as they invest to ensure that more water is available to irrigate crops. However, Mexico's workforce is undergoing an agricultural transformation, and US employers will eventually have to recruit labor from farther away or mechanize.

### Mexico's workforce is transitioning out of agriculture



### Unions

Workers exchange effort for reward in workplaces that are regulated by labor laws and influenced by unions. Agriculture was exempted from many labor laws and social protections, from minimum wage and child labor laws to social security, when they were enacted in the 1930s under the theory that "agriculture is different." Since then, federal

labor laws have been revised to end many agricultural exemptions, but agriculture remains federally exempt from union organizing and overtime laws, and child labor is regulated differently.

States have also filled in missing labor rights, and sometimes granted more rights to farm workers under state laws than are available to nonfarm workers under federal laws, as with California's Agricultural Labor Relations Act. Despite the most favorable union law in the US, fewer California farm workers are represented by unions today than were before 1975 when Cesar Chavez and the grape boycott were almost daily news items.

## **History**

Farm worker unions have been described as "much ado about nothing." (Jamieson, 1945). Hired farm workers often receive low wages and work only seasonally, and they have been hard to organize into unions because many are employed by labor contractors and are seeking better nonfarm jobs.

Economists sometimes distinguish between exit and voice labor markets. Exit labor markets offer similar work across workplaces, as with picking peaches or working in fast-food restaurants. Dis-satisfied workers typically exit such workplaces for similar jobs elsewhere rather than speak up or voice their dis-satisfaction, making it hard for unions to organize workers. Even after winning recognition, farm worker unions have found it hard to raise wages and benefits because of the layering of the farm labor market; the crew supervisors and contractors who are often considered employers in the eyes of workers may not set the wage. Finally, farm workers are dispersed across many farms, making it costly for unions to organize and serve them (Martin, 2003).

There have been many efforts to organize farm workers, but there are no links between past and present farm labor unions. The first farm worker unions, such as the Industrial Workers of the World or Wobblies before WWI, had radical leaders who wanted to replace the employer-employee wage system with worker-run cooperatives. During the 1930s, the Communist-led Cannery and Agricultural Workers Industrial Union wanted to eliminate capitalist employers. The clash of extremes between radical unions and conservative growers in agricultural areas often led to violence that was suppressed by local authorities linked to farm employers opposed to "outsider" agitators (Martin, 2003, Chapter 3).

## **UFW and FLOC**

The United Farm Workers, founded by Cesar Chavez in 1962, used sympathy from many Americans during the 1960s to enlist clergy and students to boycott stores selling table grapes, which led to most grape growers recognizing the UFW as the representative of

their employees in 1970. The grape boycott of the late 1960s is considered one of the most successful US union boycotts, persuading 15 percent of Americans to avoid grapes and lowered grower prices.

The 1970s were a roller coaster for farm worker unions. Growers who signed UFW contracts disliked them for many reasons, including requirements that they hire workers via union-run hiring halls that allocated jobs to workers based on their seniority with the UFW rather than with a particular farm. As a result, some farm worker families who commuted together were assigned to different farms. This dis-satisfaction prompted some growers to switch to the Teamsters, who already represented their nonfarm workers in packing sheds, when their UFW contracts expired in 1973.

The UFW was saved by the election of Governor Jerry Brown in 1974, who made enacting an Agricultural Labor Relations Act to give farm workers union organizing rights a top priority. The ALRA, modeled after the 1935 National Labor Relations Act that governs collective bargaining in most of the US private sector, became law in June 1975 so that the first elections could be held before seasonal workers were laid off. The ALRA differs from the NLRA by offering quick elections, a makewhole remedy for workers if employers fail to bargain in good faith with a certified union, and stronger protections for unions in their internal operations.

The UFW won most of elections in 1975-76, prompting predictions that California agriculture would soon have a construction-style labor market that offered high union wages to seasonal workers and unemployment insurance benefits to laid off workers. Most union contracts in the 1970s offered minimum or general laborer wages that were up to 50 percent higher than the state's minimum wage and enrolled covered workers in UFW-run health and pension plans.

At its peak in the late 1970s, the UFW reported almost 200 contracts and 70,000 members, although a careful count found only 108 contracts in effect in 1978.<sup>8</sup> The number of contracts and union members shrank, and today the UFW has about 30 contracts and 5,000 members.

There are four major explanations for the demise of the UFW, internal union issues, politics, changes in farm structure, and illegal immigration (Martin, 2003; Pawel, 2009). First, Cesar Chavez in the early 1980s purged dissident UFW leaders by dismantling the

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<sup>8</sup> The UFW sometimes included in its contract count farms where it was certified to represent workers but no contract was negotiated, and farms where contracts expired and were expected to be renegotiated. A careful count found 65 UFW contracts with California farms in 1975, 108 in 1978, 84 in 1981, and 28 in 1985 (Martin, Egan, and Luce, 1988).



UFW's legal department when attorneys refused to move from Salinas to UFW headquarters in remote Keene, CA (Pawel, 2014). Second, Republicans took control of the state government, and Governor George Deukmejian appointed ALRB leaders sympathetic to farm employers rather than farm worker unions. Third was the exit from agriculture of easy-to-boycott conglomerates with farming operations, making the UFW's boycott threat less potent.

The final factor in the UFW's demise was rising unauthorized migration. Oil was discovered in the Gulf of Mexico in the late 1970s, and the Mexican government borrowed money in anticipation of an oil-funded economic boom. However, the price of oil crashed in the early 1980s, many Mexicans lost their jobs, and the peso was devalued, making US farm wages up to 20 times higher than Mexican wages. Hundreds of thousands of Mexicans streamed north, which encouraged US workers to exit for nonfarm jobs and made it hard for the UFW to win wage increases for the farm workers it represented.

The UFW seemed to be an upswing with new leadership in the 1990s and again in the 21<sup>st</sup> century because Democrats have been in control of California's state government and there are ever more agribusinesses with consumer labels such as Dole and Driscoll's. The UFW demonstrated its power in the California Legislature by getting the ALRA amended with Mandatory Mediation and Conciliation in 2002 (Martin and Mason, 2003) and again in 2022 to allow farm worker unions to be certified to represent workers without a secret-ballot election. The UFW was certified as the bargaining representative on two California farms in 2023-24 after card checks, but both employers are contesting the certifications, arguing that some of the workers who signed UFW cards were not their employees.

## UFW calls for binding arbitration to obtain first contracts in 2002



Source: PLM

The UFW considers itself a national union, but has had only one short-lived contract outside California that covered orange pickers for Minute Maid (Coca Cola) in Florida in the 1970s. New York enacted a Farm Laborers Fair Labor Practices Act that provides farm workers with overtime benefits and right-to-organize protections beginning in 2021, including a card-check procedure that allows the state's Public Employment Relations Board to certify a union as the representative of farm workers if enough signed union authorization cards.

The UFW at the end of 2023 reported winning majority support via card-check on five New York farms and demanded a contract that would guarantee H-2A workers the right to return in future years. Farmers filed a suit in 2023 arguing that such contract provisions are unlawful because H-2A regulations require them to try to recruit US workers each year, making it impossible for farmers to guarantee H-2A workers future employment. After farmers obtained a video of a UFW organizer in Mexico telling H-2A

workers to sign union authorization cards before they left Mexico for New York, the NY Attorney General suspended enforcement of the union provisions of the FLFPA until federal courts make a decision on the farmers' suit.<sup>9</sup>

The UFW continues to win enactment of new protective labor laws in the California Legislature, but has been unable to accomplish its major objective, the enactment of federal immigration reforms that would legalize unauthorized farm workers. The UFW argued before the Immigration Reform and Control Act of 1986 that unauthorized migrants worked "hard and scared" but would be easy to organize once they were legal US workers because they no longer feared deportation. IRCA legalization did not lead to additional UFW contracts, but did speed worker exits from farm work and fuel the arrival of more unauthorized farm workers.

The other major farm worker union is the Farm Labor Organizing Committee founded in 1967 by Baldemar Velasquez in Ohio. FLOC followed in the footsteps of the UFW by organizing boycotts of Campbell's and Vlasic in the 1980s to persuade them to require the Ohio farms from whom they bought cucumbers and tomatoes to recognize FLOC as the bargaining representative of their farm workers and abide by the terms of contracts negotiated between FLOC and Campbells and Vlasic. Farmers did not participate in the negotiations, but if they wanted to sell to Campbells and Vlasic, they had to recognize FLOC and pay the wages and benefits specified in the agreement.

FLOC used similar top-down pressure to win a contract with the North Carolina Growers Association, which brings up to 10,000 H-2A guest workers from Mexico to North Carolina tobacco and cucumber farms each year. The FLOC boycotted the Mt Olive Pickle Company until Mt Olive in 1999 negotiated an agreement with FLOC that required farmers selling cucumbers to Mt Olive to recognize the FLOC as the representative of their workers, most of whom were brought to farms by the NCGA. North Carolina is a right-to-work state, meaning that the FLOC-Mt Olive-NCGA cannot require farm workers to join the FLOC, so FLOC educates guest workers in Mexico about the importance of paying 2.5 percent of their wages in union dues to FLOC. FLOC in the 2020s represents more farm workers than the UFW.

The Familias Unidas Por La Justicia union in Washington was formed after workers employed by the Sakuma berry workers went on strike in 2013, prompting the farm to change rules for workers living in Sakuma housing in 2014. Familias Unidas sued Sakuma, and in Fall 2014 a judge ruled that Sakuma cannot prevent workers who are living in Sakuma housing from having visitors in their homes rather than at a designated

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<sup>9</sup> For more details, see <https://migration.ucdavis.edu/rmn/more.php?id=2911>

visitors' center. Sakuma negotiated a two-year collective bargaining agreement with Familias Unidas por las Justicia in June 2017 covering 600 workers on its 700-acre berry farm.<sup>10</sup>

As of 2023, the UFW represented farm workers employed at Chateau Ste Michelle and Beef Northwest in Washington while Familias represented workers at Sakuma Farms.<sup>11</sup> The UFW alleges that Ostrom Mushroom Farms in Sunnyside, Washington replaced US workers with H-2A guest workers in 2022. Ostrom was sold to Canada's Windmill Farms in 2023, which renamed it Greenwood Mushrooms Sunnyside and reduced the productivity standard to require pickers to pick at least 50 pounds an hour.<sup>12</sup>

### **Farm Worker NGOs**

Numerous community groups aim to help farm workers without representing them in formal procedures before federal and state agencies. These groups can be short-lived, disappearing when key leaders leave or funding is reduced. The Mixteco Indigena Community Organizing Project (MICOP) sometimes files charges on behalf of farm workers with the ALRB and other enforcement agencies, but does not represent farm workers on any farm and draws complaints from farm employers for acting like a union without filing paperwork with federal and state agencies.

Many farm worker NGOs received a lifeline during and after the covid pandemic by administering federal and state programs that provided aid to, inter alia, farm workers. The USDA in October 2022 made \$670 million in grants to 15 NGOs to provide \$600 grants to farm, meatpacking, and grocery store workers.<sup>13</sup> The UFW was the lead organization that provided assistance to other NGOs seeking to help farm workers, and the UFW Foundation received \$98 million to distribute. Organizations distributing grants to farm workers can keep up to 15 percent of the amount received for administrative costs.

The Pineros y Campesinos Unidos del Noroeste (PCUN) advocates on behalf of farm workers in Oregon. After a boycott of NORPAC Foods, a cooperative of 240 growers, PCUN and NORPAC reached a Framework for Managing Farm Labor Relations in 2002 with "clear and enforceable guidelines that provide [farm workers] with an opportunity to elect PCUN to represent them. If they do elect to join PCUN, it also establishes a

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<sup>10</sup> <https://migration.ucdavis.edu/rmn/more.php?id=2077>

<sup>11</sup> The UFW signed a contract covering about 250 workers with Threemile Canyon Farms in 2007.

<sup>12</sup> <https://migration.ucdavis.edu/rmn/more.php?id=2868>

<sup>13</sup> <https://www.ams.usda.gov/services/grants/ffwr>

framework for contract negotiations with the participating NORPAC member-growers."<sup>14</sup>

The Coalition of Immokalee Workers (CIW) is an NGO that urged growers to raise the piece rate for picking mature green tomatoes by a penny a pound, almost doubling the piece rate from 40 to 45 cents for each 32-pound bucket to 70 to 75 cents (Martin, 2021). The CIW exposed labor contractors who enslaved some workers and, after growers refused to raise piece rates, the CIW mounted boycotts of the fast-food restaurants that buy many of the mature green tomatoes.

Beginning with Yum Brands (Taco Bell) in 2005, fast food restaurants began to sign agreements with the CIW that offered their tomato suppliers an additional 1.5 cents a pound for tomatoes picked under the CIW's Fair Food Program (FFP), with one cent going to pickers and a half cent going to growers to cover their additional administrative costs. The Florida Tomato Growers Exchange, which represents the 12 major tomato producers, signed onto the FFP in 2010.<sup>15</sup> The US acreage of mature green tomatoes is declining as imports of vine-ripened tomatoes increase; 60 percent of US fresh tomatoes were imported in 2023.

There are also labor certification programs that aim to distinguish good farm employers, that is, farm employers who comply with labor laws and involve farm workers in decision making. The Equitable Food Initiative (EFI), launched by Oxfam America in 2012 with the support of Costco and other stakeholders, aims to be an international program that covers farms and workers in all commodities in North America (Martin, 2021).

EFI has 326 performance indicators grouped into four categories: cross-sectional, labor, food safety and environmental.<sup>16</sup> Each category includes three to 10 items labeled as critical, major, and minor, and all critical indicators are audited once a year. For example, cross-sectional standards include compliance with federal, state and local labor laws (major), labor management cooperation to develop a leadership team on the farm (critical), and non-retaliation against workers who participate in EFI or report violations of EFI standards (critical). Labor standards range from compliance with worker health and safety regulations to fair compensation. Workers are to be informed of the terms

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<sup>14</sup> <https://migration.ucdavis.edu/rmn/more.php?id=579> and <https://migration.ucdavis.edu/rmn/more.php?id=337>

<sup>15</sup>Members of the FTGE in 2010 were: Ag-Mart Produce, Big Red Tomato Packers, Classie Growers, DiMare Co, Gargiulo, Harllee Packing, Nobles-Collier, Pacific Tomato Growers, Six L's Packing, Taylor & Fulton Packing, Tomatoes of Ruskin, and West Coast Tomato. <https://migration.ucdavis.edu/rmn/more.php?id=1585>

<sup>16</sup> See <https://equitablefood.org/efi-standards/>

and conditions of employment and “an accurate definition of the piece rate system” (minor). EFI certification requires compliance with all indicators.

Once a farm is in compliance with EFI standards, a third-party auditor issues a certificate of compliance that allows the farm to put the EFI label, Responsibly Grown, Farmworker Assured, alongside its own label on its produce. EFI staff are funded by foundation and corporate grants to publicize the program, train leadership teams on farms, and work with growers and buyers. At the end of 2023, there were 62 North American farms certified by EFI.<sup>17</sup>

Fair Trade USA certifies fair-trade products to enable sustainable development and to empower communities that produce food and other commodities. Fair Trade USA “audits and certifies transactions between US companies and their suppliers to guarantee that the farmers and workers producing Fair Trade Certified goods are paid fair prices and wages, work in safe conditions, protect the environment and receive community development funds to empower and uplift their communities.” This triple win for people, the planet, and profit is supported by supermarkets such as Kroger and Walmart that pay a premium for Fair Trade USA-certified products.

The Fair Trade USA agricultural production standard includes six modules dealing with worker empowerment, fundamental rights at work, wages and working conditions, environmental sustainability traceability, and internal management. Some of these standards are subjective, such as “fair wages” or plans to improve health and safety, although participating farms must show improvement from year to year. Farms are audited, and products that satisfy the agricultural production standard can include the fair-trade label (Martin, 2021). Fair Trade USA reported 125 certified produce farms in 2024.<sup>18</sup>

### **Machines, Migrants, and Imports**

There are three major ways to provide fresh fruits and vegetables to Americans: produce them in the US with machines or migrant guest workers or import crops from abroad (Martin, 2023). Rising wages and the shrinking number of US farm workers encourages mechanization and more migrants, while lower wages abroad have led to more imports.

### **Mechanization**

Mechanizing hand tasks in agriculture often requires three steps: a systems perspective, cooperation between biologists and engineers, and trial-and-error refinements. Mechanization is rarely a case of machines seamlessly replacing workers because a

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<sup>17</sup> <https://equitablefood.org/>

<sup>18</sup> <https://www.fairtradecertified.org/what-we-do/what-we-certify/produce/>



farming system must usually change for machines to replace hand workers. Tall fruit trees can be replaced by dwarf trees whose limbs are trained to grow on wires as in a vineyard, and such fruiting walls make it easier for machines to identify and pick ripe fruit.

### **Apples on vertical trellises may be harvested by robots in the future**



The second key to labor-saving mechanization is cooperation between biologists and engineers. Scientists must often modify plants so that engineers can develop cost-effective harvesting systems. For annual crops such as leafy vegetables, one key to mechanization is uniform ripening, so that 90 percent or more of the crop can be harvested in one pass through the field.<sup>19</sup>

Many fruits are picked multiple times, from apples and blueberries to oranges and peaches, and the first pick often yields 50 to 75 percent of the total harvest. However,

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<sup>19</sup> Machines often damage plants, complicating multiple passes through fields.

the remaining fruit may make the difference between profit and loss, giving growers incentives to pick all marketable fruit. Raising the share of the total crop that can be picked during the first harvest makes machine harvesting more cost effective.

Crops such as strawberries are often picked twice a week and 40 to 50 times during the season. Workers pick strawberries directly into the clamshells in which they are sold, pushing a light wheeled cart that holds a tray with eight one-pound clamshells. Putting slow-moving conveyor belts in front of pickers increases hand worker productivity by eliminating the need to carry full trays to collection stations at the end of rows. Mechanizing the harvest of fragile strawberries requires sophisticated and expensive machines that to date are too slow to compete with hand workers.

The third mechanization challenge is to refine labor-saving machines in a trial-and-error process to develop commercially viable systems. The first machines are rarely those that dominate a decade later because of refinements that are made in response to experience. Dust, uneven ground, and moisture can damage sensitive equipment, which is why experimentation often leads to more durable machines that can adapt to ever-changing field conditions.

Farmers are cautious about buying expensive machines if farm workers are available. Many machines developed in labs do not work as well as anticipated in the field, so that early adopters may buy a machine that does not work and have to pay hand workers to pick the crop, raising costs. Harvesting aids that make hand workers more productive may reduce incentives to develop fully mechanized systems. For example, the conveyor belts that travel in front of workers harvesting heads of lettuce raise the bar for a lettuce harvesting machine.

There is a final economic difference between hand- and machine-work. Hand workers are variable costs, meaning that farmers do not pay wages if weather or disease ruin the crop or if prices are so low that the crop is not harvested. A purchased machine, on the other hand, becomes a fixed cost that must be paid for whether there is a crop to be harvested or not. Some firms provide machine harvesting as a service, but they must set prices that reflect the possibility of having nothing to harvest.

### **Guest Workers**

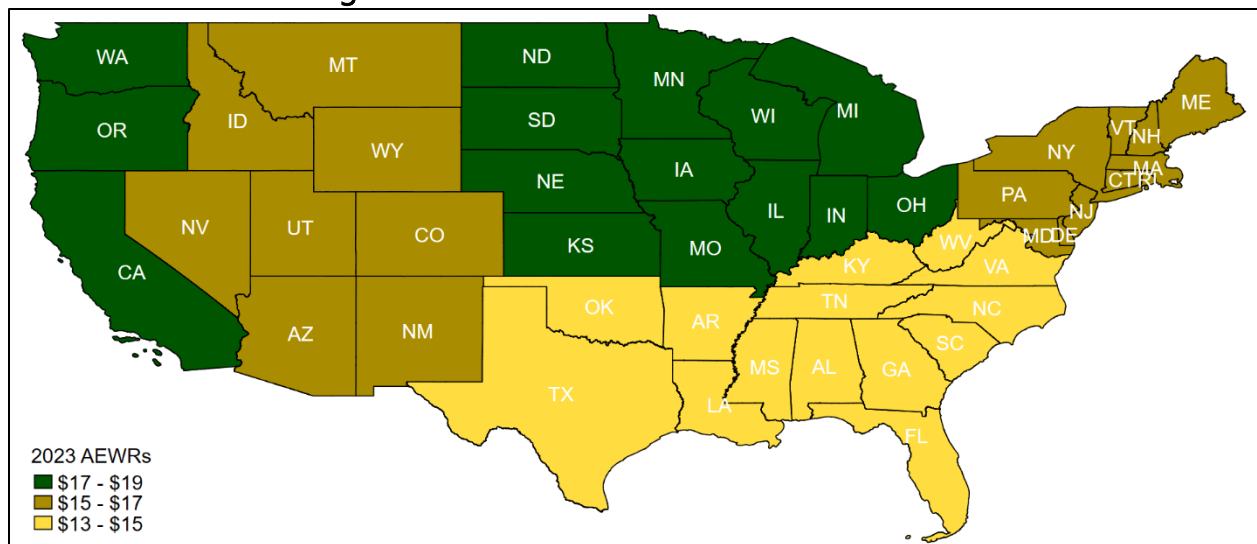
The second way to produce fresh fruits and vegetables in the United States is to recruit guest workers from lower wage countries. The H-2A program has since 1952 allowed US farmers who anticipate too few US workers to be certified by the DOL to recruit and employ guest workers to fill seasonal farm jobs. In order to receive DOL certification, farm employers must satisfy three major criteria. First, DOL must certify that the



employer tried and failed to recruit enough US workers. Second, after being certified, employers must recruit workers abroad, pay worker travel expenses to and from their home countries, and offer free and approved housing to H-2A workers while they are employed in the US and daily transportation between this housing and the work place.<sup>20</sup>

Third, the employer must offer and pay the higher of the federal or state minimum wage, the prevailing wage rate, or the Adverse Effect Wage Rate (AEWR) to H-2A and US workers in similar employment. The AEWR is normally the highest of these wages and ranged from almost \$14 to over \$18 an hour across states in 2023. Adding at least \$5 an hour for transportation, housing, and other expenses makes the total cost of H-2A workers at least \$19 to \$23 an hour, which is more than the cost of US workers who are not provided with transportation and housing. H-2A guest workers provide labor insurance because they are tied to their US employer by contracts, and are in the US an average of six months (Martin and Rutledge, 2021).

### 2023 Adverse Effect Wage Rates



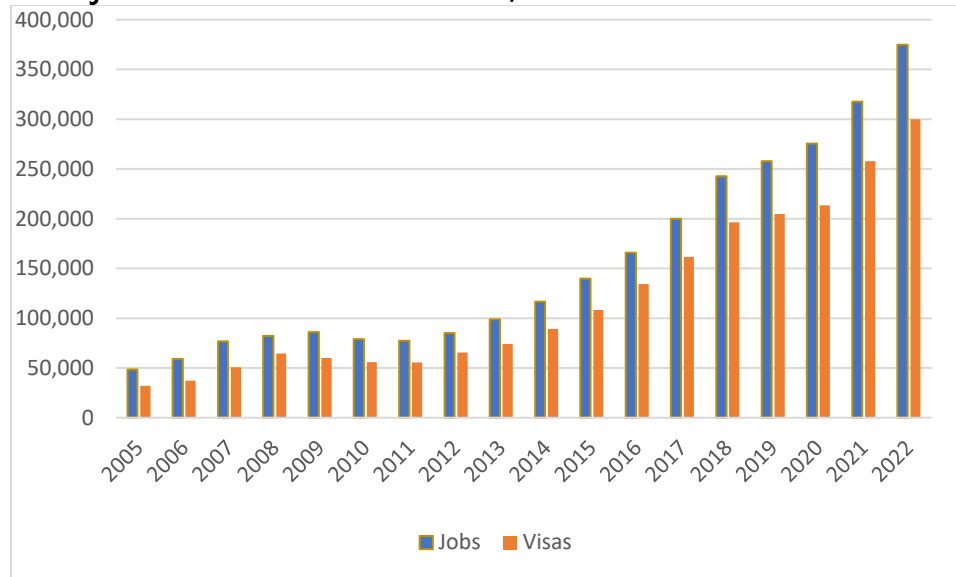
The H-2A program expanded after the 2008-09 recession as fewer unauthorized Mexicans entered the US for fear that, after paying thousands of dollars in smuggling fees, they would be unable to find jobs. In 2000, over half of US crop workers were unauthorized, including a quarter who were newcomers, meaning that they were in the US less than a year before being interviewed. After 2010, the unauthorized share of crop workers fell to 40 percent and the share of newcomers dropped to two percent.<sup>21</sup>

<sup>20</sup> Any out-of-area US workers hired in response to employer recruitment efforts receive the same travel and housing benefits as H-2A workers.

<sup>21</sup> <https://migration.ucdavis.edu/rmn/blog/post/?id=2643>

Reduced Mexico-US migration was mirrored in the rising number of H-2A guest workers. The number of farm jobs certified to be filled by H-2A workers increased from less than 100,000 in FY13 to 372,000 in FY22, and is on track to top peak Bracero admissions of 450,000 by 2025. Not all of the jobs certified to be filled by H-2A workers are in fact filled by such workers, and some H-2A visa holders are able to fill two or more certified jobs. The number of H-2A visas issued is typically 80 percent of the number of jobs certified, about 300,000 in FY22.

### H-2A jobs certified and visas issued, FY05-22

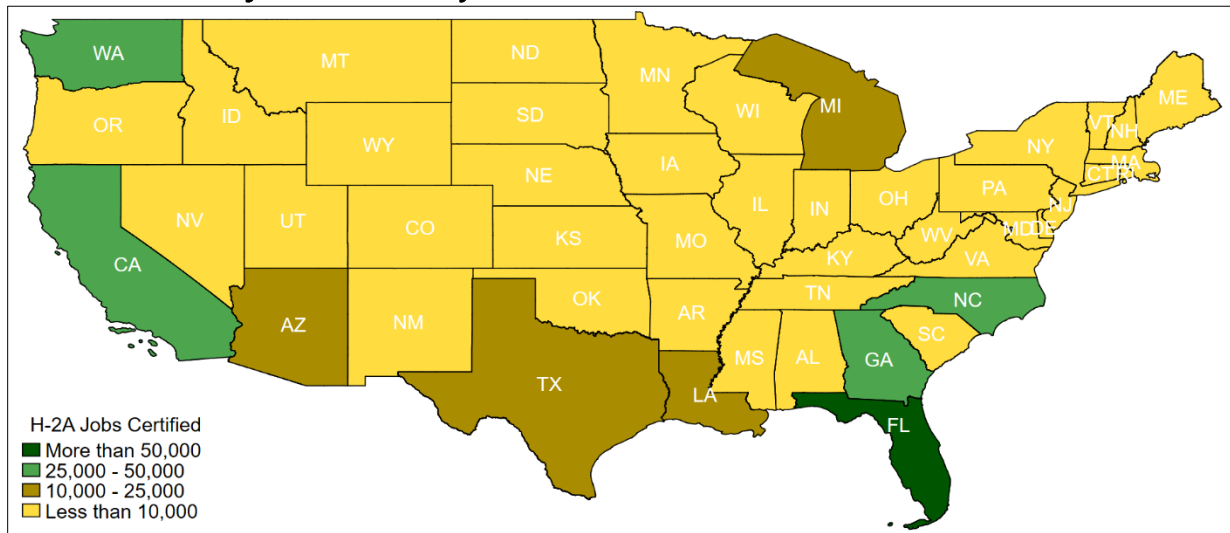


Source: US Departments of Labor and State

There are about 1.5 million full-time-equivalent jobs in US agriculture, including 1.1 million in crops and 400,000 in animal agriculture.<sup>22</sup> H-2A workers are in the United States an average six months, so 300,000 H-2A workers filled about 15 percent of the FTE jobs in US crop agriculture in 2023. 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).

<sup>22</sup> California has almost a third of these jobs, 425,000 year-round equivalent farm jobs, including 390,000 in crops.

### Number of H-2A jobs certified by state in FY2023



### 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
<b>Total of Top 5</b>	<b>192,107</b>	<b>\$2,785.4</b>

Should the rapid expansion of the H-2A program be welcomed or feared? Answering this question requires an understanding of how the program works and the options to change it, including proposals to end the requirement that employers try to recruit US workers, to allow farmers to provide H-2A workers with a housing allowance of \$1 to \$2 per hour worked rather than providing them with free housing, and freezing or eliminating the AEWR.

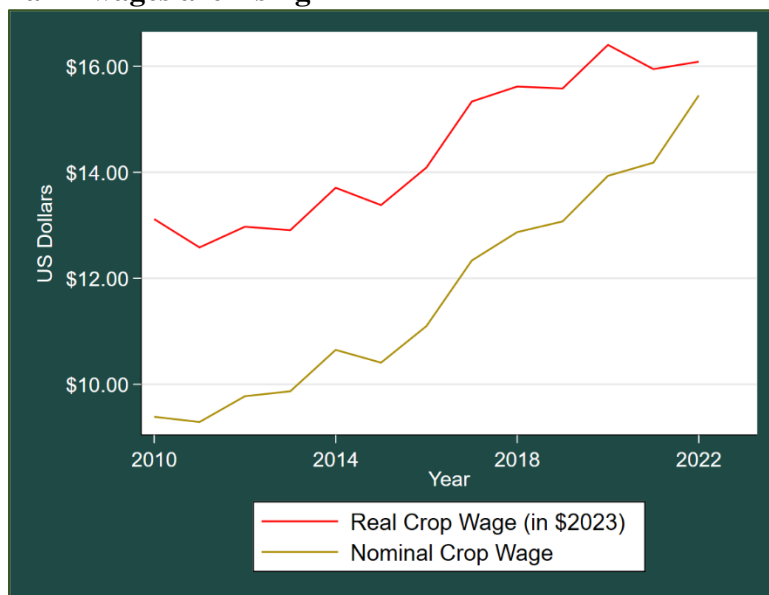
Second, is DOL certification effective to prevent H-2A workers from adversely affecting US farm workers? H-2A workers are generally younger than US workers and selected for their ability to do the job, making them 15 to 30 percent more productive than US workers in terms of bins of apples or oranges picked per hour or day. How can US workers be protected if H-2A workers are more productive, willing to work long hours if needed, and loyal to their employer because they cannot leave for another job?

Third, does the availability of H-2A workers slow labor-saving mechanization or do H-2A workers act as a bridge to mechanization (Martin, 2009)? Do US growers have any obligation to guest and US workers who may be displaced after mechanization or imports substituting for US production?

### Farm Labor Costs

Real farm wages are rising. After accounting for inflation and converting into 2023 dollar values, they have risen by more than 20% over the past decade (top red line in figure below). Without accounting for inflation, farm wages have increased by more than 40% since 2010 (bottom gold line in figure below). 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.

### Farm wages are rising



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

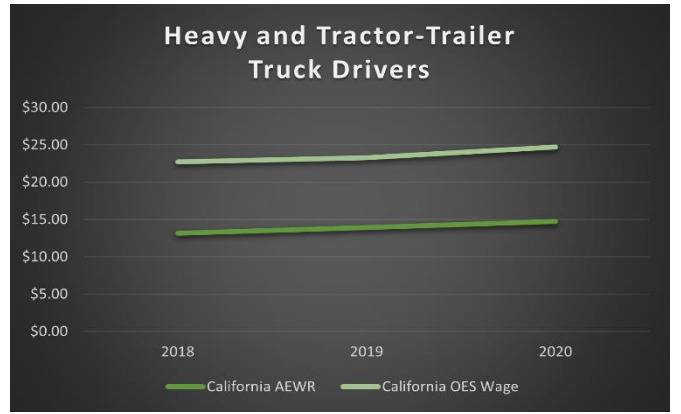
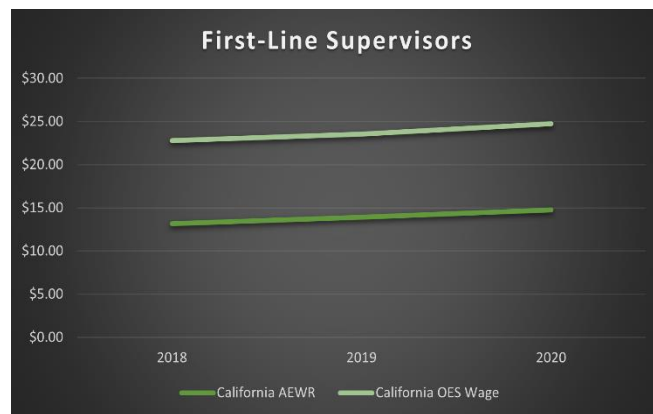
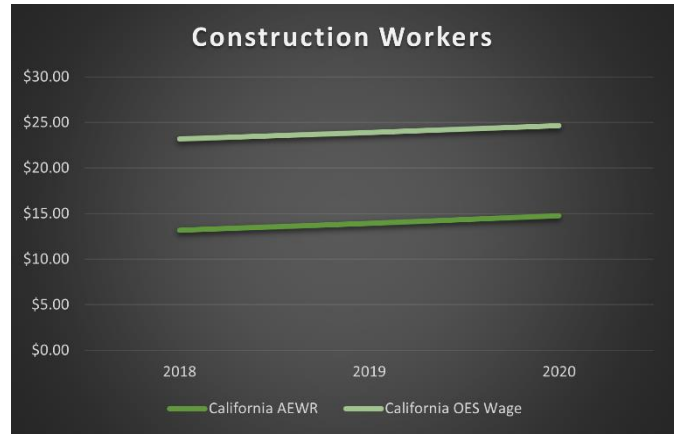
### Adverse Effect Wage Rates

Foreign-born employees with low levels of formal education tend to have low reservation wages and are often viewed competitors for US jobs (Congressional Research Service, 2008). The US government implemented a minimum wage for H-2A workers called the Adverse Effect Wage Rate (AEWR) to help mitigate adverse effects from the employment of temporary foreign workers in the agricultural sector. H-2A workers must be paid the highest of the state or federal minimum wage, the prevailing wage, the state's AEWR, or the relevant collective bargaining agreement wage. In

February 2022, the DOL published a rule that designated the USDA's Farm Labor Survey (FLS) as the basis for most AEWRs for the SOC codes 45-2041, 45-2091, 45-2092, 45-2093, 53-7064, and 45-2099. All other SOC codes are assigned an AEWR based on the Bureau of Labor Statistics' Occupational Employment and Wage Statistics (OEWS) survey. In 2023, the USDA's FLS AEWRs ranged from a low of \$13.67 in the southeastern part of the country to a high of \$18.65 in California.

Some states, such as Michigan, had their FLS AEWR increase by as much as 13% in 2023 when the average increase over the previous decade was around 5% per year. Industry sources claim that the AEWR increases are unpredictable and are at a point where the economic viability of domestic specialty crop production is being threatened. The new DOL rule affects serves to increase the wages of H-2A employees performing higher-skilled jobs, such as construction and truck driving. The figures below shows a comparison of some higher-skilled AEWRs under the FLS and OEWS prior to the DOL rule being implemented. These figures reveal that managers who would have earned around \$15 under the FLS AEWR would have had their wages increase to \$45, while construction workers, first line supervisors, and truck drivers would have had their wages rise from about \$15 to \$25.

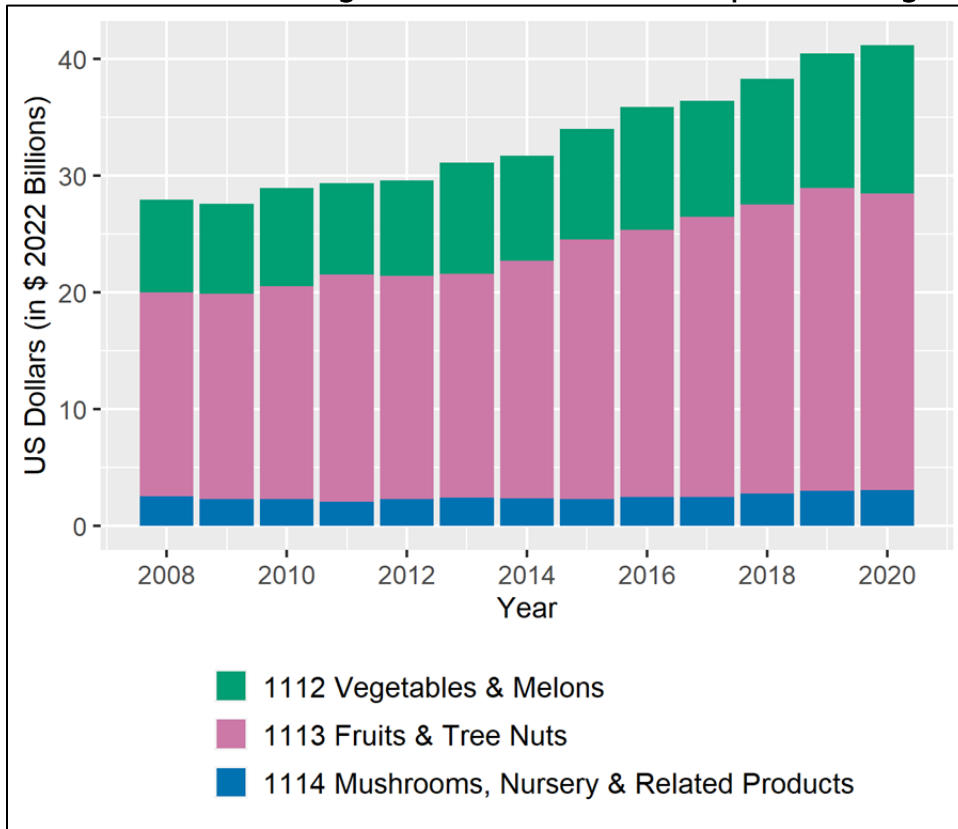
## DOL raised the minimum wage of higher-skilled H-2A employees in 2023



## Imports

The third adjustment to provide Americans with fresh fruits and vegetables is to import more from lower wage countries. Over 60 percent of US fresh fruit, and 40 percent of US fresh vegetables, are imported. Between 2008 and 2020, the value of imported fruits, vegetables, and horticultural crops rose from about \$28 billion to more than \$40 billion in \$2022.

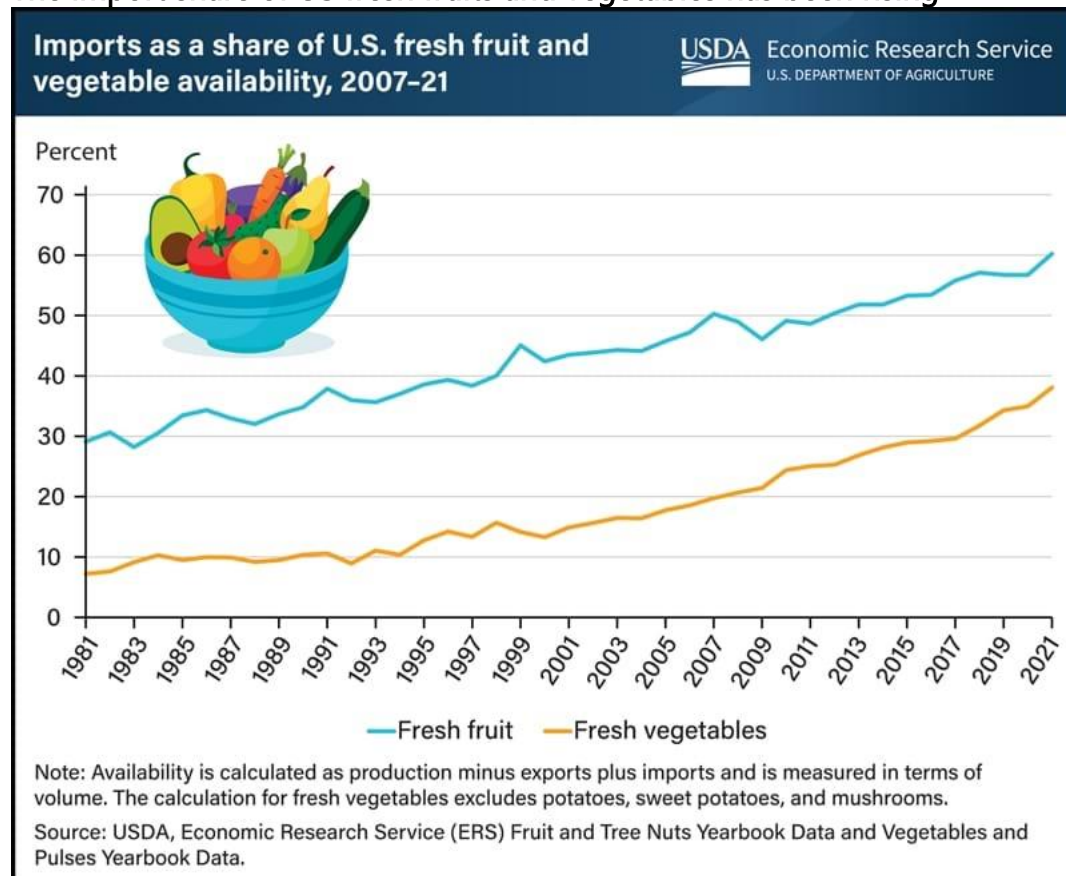
### The value of US fruit, vegetable, and horticulture imports is rising



Source: Author’s calculations using import data and Import price indices (IPI) for NAICS 111 (Crop production) product category from U.S. Census Bureau.

Mexico is the source of almost half of US fresh fruit imports, led by avocados, and two-thirds of the fresh vegetable imports, led by tomatoes. The US imported FVH commodities worth an average \$15 billion a year from Mexico in recent years.

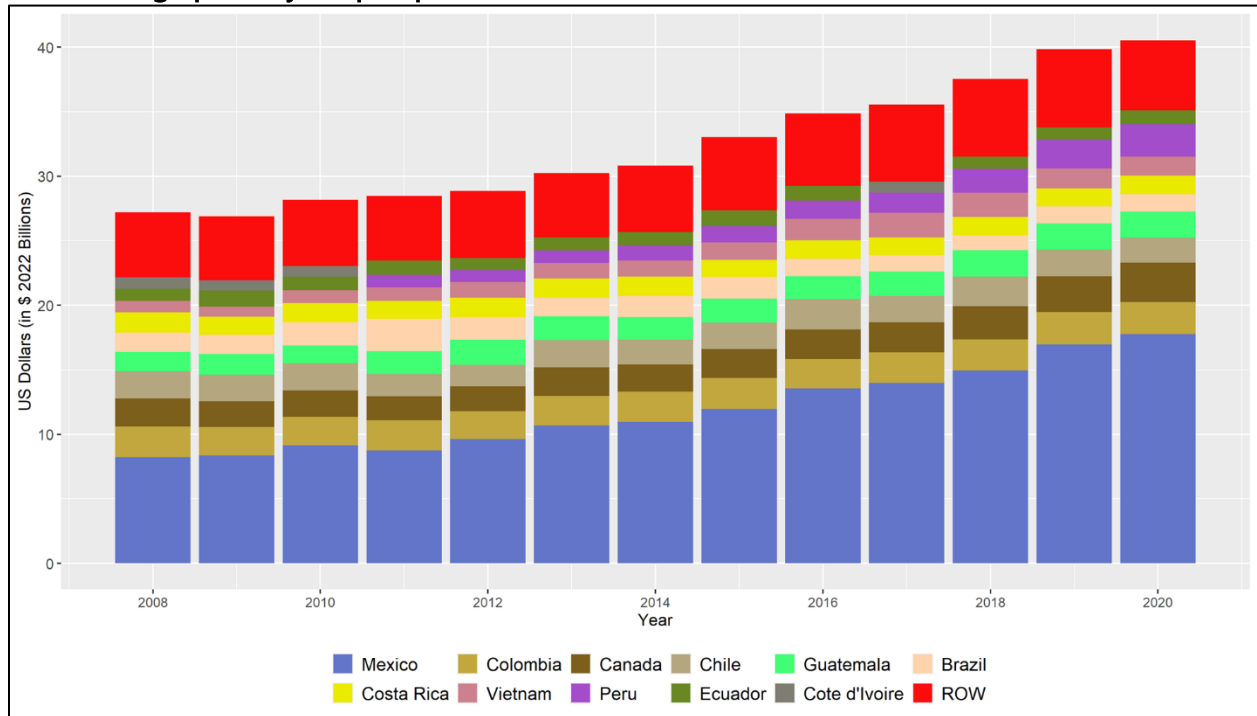
## The import share of US fresh fruits and vegetables has been rising



Mexico is the leading supplier of imported tomatoes, avocados, raspberries, bell peppers, and strawberries, many of which are produced under protected cultures such as greenhouses, screenhouses, and plastic-covered tunnels. The next five leading countries are Columbia, Canada, Chile, Guatemala, and Brazil, each with roughly 5% to 10% of the US import market.



## The leading specialty crop exporter to the US is Mexico

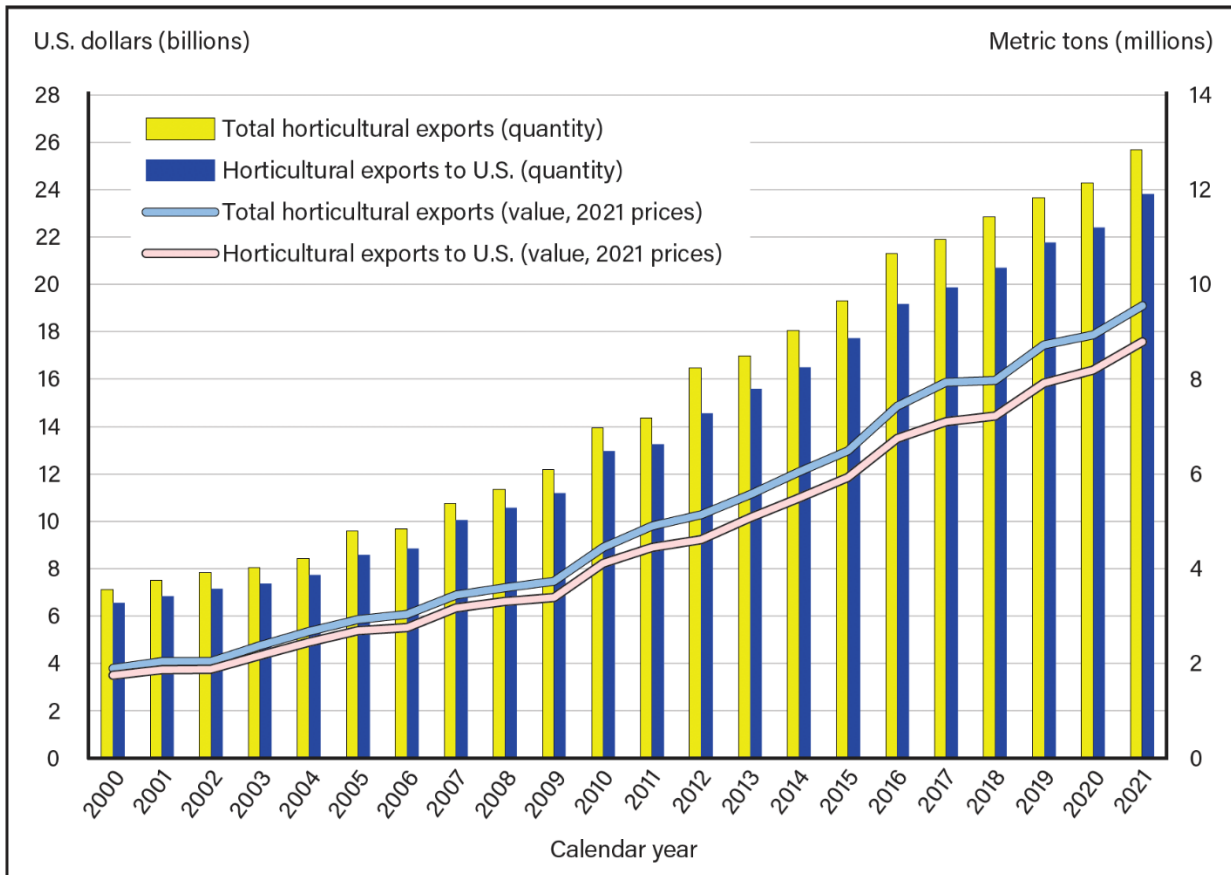


There are several reasons for the upsurge in Mexican exports of horticultural commodities to the US, including free trade agreements such as NAFTA-USMCA and an improving infrastructure that can truck Mexican produce to the US quickly using the same highways that are used to transport goods made in Mexico to the US. Farm labor costs in Mexico are 10 to 20 percent of US farm labor costs, and Mexican export farms have latecomer advantages, such as producing high-value fruits and vegetables under protective structures such as greenhouses and shade houses rather than in open fields, what USDA calls controlled environment agriculture (CEA), which allows Mexican farmers to extend their export seasons so that they increasingly compete with US-produced fruits and vegetables, especially in the southeastern states.

## Mexican horticultural exports to the US increased fourfold in the 21<sup>st</sup> Century

Figure 1

**Mexican horticultural exports, 2000–21**



Some fruits and vegetables produced in Mexico are destined primarily for the US. For example, up to half of the tomatoes, lettuce, watermelons, avocados, and strawberries that are grown in Mexico, and up to 75 percent of the asparagus, broccoli, and cucumbers grown in Mexico, are exported to the US. Some of these commodities arrive in the US every month of the year, such as tomatoes, while others are more seasonal, such as strawberries that arrive in the US between December and April.

### Conclusions

The US has a large and complex farm labor system that involves older, white, and US-born farm operators hiring younger, non-white, and non-citizen hired workers. There are two million US farms, and 100,000 to 500,000 rely on hired workers to produce crops and livestock. Agriculture is a 90-10 industry, meaning that relatively few large farms account for most farm employment and output, so that the largest 10,000 or 10 percent US farm employers account for 80 to 90 percent of farm employment. Large farms hire workers directly and also rely on nonfarm businesses such as farm labor contractors to bring workers to their farms.

Almost three-fourths of US crop workers employed were born in Mexico, including up to a million who are not authorized to work in the US and 300,000 who are legal H-2A guest workers. The unauthorized Mexican-born workers arrived in their 20s and 30s in the 1990s and early 2000s, and are now settled in one place and aging out of seasonal farm work. The fresh blood in the farm workforce are H-2A guest workers, 90 percent of whom are Mexican men in their 20s and 30s.

The farm labor market matches workers with jobs, motivates them to work, and retains or rehires the best workers. The 3 Rs of recruitment, remuneration, and retention are different in agriculture. Farm operators often rely on crew supervisors or FLCs to recruit crews of workers in the US and abroad. Many harvest workers are motivated to work fast by piece rate wage systems that pay workers according to the number of bins or trays picked. Relatively few farm employers have formal systems to evaluate and promote their employees, relying instead on a pool of workers to be available when needed to fill seasonal jobs.

Farm labor costs have been rising rapidly as the supply of US workers shrinks faster than the demand for farm workers, states raising their minimum wages, and more farmers hiring H-2A guest workers and incurring housing and transport costs. The options to provide Americans with US-produced fresh fruits and vegetables include the mechanization of hand-labor tasks and more H-2A guest workers. Alternatively, imports of fresh fruits and vegetables could continue to increase, reflecting the comparative advantage of countries with lower wages.

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