

# More jobs and less seasonal employment in California agriculture since 1990

Agricultural employment rose 10% from 1990 to 2020, with less seasonality but more use of contract labor.


by Zachariah Rutledge and Philip Martin

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Over the past decade, the number of H-2A guest workers employed on California farms increased more than tenfold, so that almost 44,000 farm jobs were certified to be filled by H-2A workers in fiscal year (FY) 2022 (DOL 2022). During FY2020, two-thirds of the H-2A jobs certified in California were in crop support services. Most crop support jobs were with farm labor contractors (FLCs), but one-sixth were hired directly by fruit producers. Almost 10% of the H-2A workers were hired directly by vegetable producers (Castillo et al. 2022). Until the 2008–2009 recession, most H-2A workers were in southeastern states such as Florida. However, the slowdown in migration of undocumented individuals after 2008–2009, combined with a stable demand for farmworkers and the aging and settling of undocumented workers who arrived before 2008–2009, contributed to the rapid growth in the H-2A program in the three Pacific Coast states that employ half of U.S. farmworkers, a third of whom work in California.

## Abstract

Employment in California agriculture has increased over the past 30 years and has become less seasonal. There were an average of 404,000 farm jobs in California in 2020, 10% more than average employment of 367,000 in 1990. Meanwhile, seasonality, as measured by peak month employment divided by trough month employment, fell 22% over three decades, from 1.8 in 1990 to 1.4 in 2020. Most farmworkers have one farm employer a year, although that employer may be a labor contractor who moves workers from one farm to another. Most new workers in the California farm workforce are H-2A guest workers, the young and flexible Mexican workers who are legally authorized to work in the United States and who are often brought to farms by labor contractors. In the future, rising employment and declining seasonality, combined with an aging and settled farm workforce, may reduce farmworker migration and flexibility.



Farmworkers pick strawberries in Southern California. Strawberries and other berries are among the most labor-intensive commodities grown in California. Farm employment has increased over the past three decades, and the gap between peak and trough employment has declined. *Photo: Joshua Rainey Photography, iStock.com.*



This paper analyzes agricultural employment data from the California Employment Development Department (EDD 2022a) and the Quarterly Census of Employment and Wages (EDD 2022b) to understand changing patterns of farmworker employment in the 21st century. The data show that seasonality is declining in most regions and commodities, primarily because of higher employment during the winter months, which may reflect more winter pruning jobs and fewer summer harvesting jobs. Second, the data emphasize the increasing importance of nonfarm crop support employers, mostly labor contractors, who bring workers to farms to perform specific tasks. More farms appear to be developing a year-round workforce that is hired directly and supplemented when needed with workers brought to farms by labor contractors, including H-2A guest workers (Rutledge and Mérel 2022).

California requires all employers who pay \$100 or more in wages to enroll in the state's unemployment insurance system and pay taxes of 1.5% to 6.2% on the first \$7,000 of each employee's wages (\$105 to \$434) to cover the cost of unemployment benefits for laid-off workers (EDD 2022a). Employers also report their employment for the payroll period that includes the 12th of the month. Summing these monthly employment

totals and dividing by 12 months generates average employment, also referred to as year-round equivalent jobs. The monthly employment measures allow us to determine the peak and trough employment months.

Agricultural employment, as defined by the North American Industry Classification System (NAICS 11), peaked at 470,000 in May 2020 and was 346,000 in March 2020, generating a peak-trough ratio of 1.4. More than 470,000 workers are employed on California farms sometime during the year. Workers who are employed only in payroll periods that do not include the 12th of the month, such as those who work only during the first, third, or fourth weeks of the month, are excluded from average employment. In 2016, when California's agricultural employment averaged 425,000, almost a million unique Social Security Numbers were reported by the state's agricultural employers, suggesting 2.3 unique workers for each year-round equivalent job (Martin et al. 2019).

## An expanding farming economy

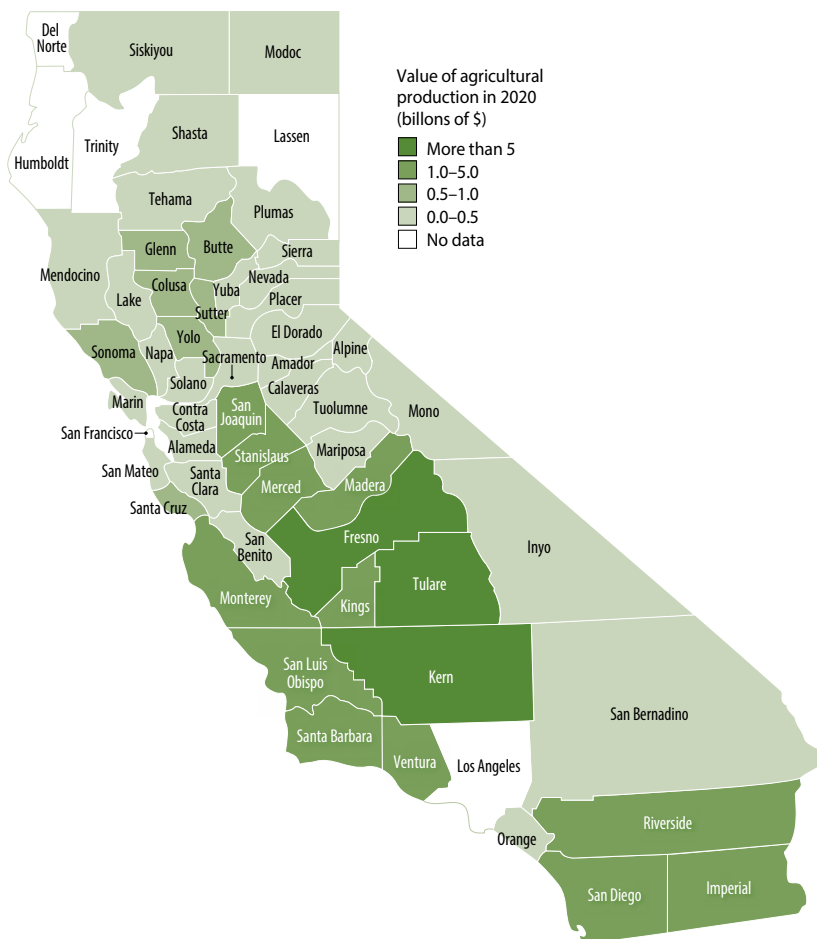
California became the leading farm state in terms of sales in 1949, when Los Angeles County led the United States in farm sales (Johnston and McCalla 2004). The state's population doubled between 1950 and 1970, from 10 million to 20 million, and agricultural sales grew fastest in the San Joaquin Valley (SJV) after water projects allowed more acres to be irrigated and suburbanization reduced the availability of farmland in coastal areas.

Citrus and dairy farms in Southern California migrated north to SJV, while tree fruit farms moved from the urbanizing Bay Area to the San Joaquin and Sacramento valleys (Johnston and McCalla 2004). Three SJV counties — Fresno, Kern and Tulare — accounted for 20% of California farm sales in 1949, a third in 2000, and almost half of the state's farm sales in 2020 (fig. 1).

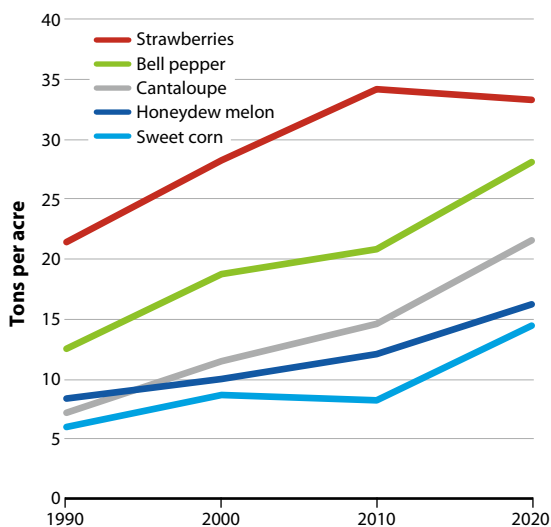
Some crops that were already concentrated in the Sacramento and San Joaquin valleys expanded in acreage. For example, there were 90,000 bearing acres of almonds in 1950, almost 150,000 acres in 1970, 500,000 acres by 2000, and 1.3 million acres in 2022. Most of this additional almond acreage was in the San Joaquin Valley.

New orchards and dairies in the San Joaquin and Sacramento valleys were often larger and more efficient than the coastal farms they replaced, and their higher productivity was reflected in rising yields. Average yields of many fruits and vegetables doubled and tripled over the past three decades; bell peppers and cantaloupes are examples. Yield rose over 50% to 33 tons an acre for strawberries (fig. 2).

The major change in California crop farming over the past half-century has been the rising share of high-value fruits, nuts, vegetables, and melons, as well as horticultural specialties such as flowers and plants, in the state's farm sales. In 1960, the value of fruit,



**FIG. 1.** California farm production value by county, 2020. *Source:* USDA 2023.



**FIG. 2.** Yields for selected fruits and vegetables, 1990–2020 (tons per acre). *Source:* USDA 2023.

vegetable, and horticultural (FVH) commodities was two-thirds of the total value of California crops; since 2000, FVH commodities have accounted for over 90% of the value of California crops, reflecting growing consumer demand for fresh produce and nursery plants (Johnston and McCalla 2004). Cotton was California’s most valuable crop in 1950; by 2000, cotton was the sixth most valuable crop, and by 2020 cotton was no longer among the state’s top 20 crops.

The demand for FVH commodities rises with income, and rising farmland prices encouraged individuals and investors to buy farmland as a hedge against inflation in the 1970s, a decade in which the value of California farmland more than doubled (Johnston and McCalla 2004). Higher interest rates in the 1980s led to a farm financial crisis that was more severe in midwestern states than in California, but encouraged some oil firms and conglomerates to sell their California farmland.

The data in table 1 show that California’s farm sales almost tripled in three decades, and that fruit and



Farmworkers cut and package lettuce in Salinas. New research shows that yields for fruit and vegetable crops have increased over the past three decades. *Photo:* rightdx, iStock.com.

nut sales almost quintupled. The value of the state’s vegetables and melons doubled, as did the value of greenhouse and nursery crops. The state’s farm sales were \$17.8 billion in 1990, including \$4.4 billion worth of fruits and nuts and \$3.9 billion worth of vegetables. Farm sales were \$27.2 billion in 2000, including \$7.3 billion worth of fruits and nuts, \$6.2 billion worth of vegetables, and \$2.8 billion worth of greenhouse and nursery commodities. This rose to \$37.5 billion in 2010, including \$13.5 billion worth of fruits and nuts, \$6.7 billion worth of vegetables, and \$3.8 billion worth of greenhouse and nursery commodities. In 2020, farm sales were \$49.1 billion, including \$20.6 billion worth of fruits and nuts, \$7.8 billion worth of vegetables, and \$6.3 billion worth of greenhouse and nursery commodities. In real or inflation-adjusted terms, California farm sales rose by 40% over 30 years, and fruit and nut sales by 140%, while vegetable and nursery sales were little changed.

**TABLE 1.** California farm sales, 1990–2020

Year(s)	Total	Fruits and nuts	Vegetables and melons	Greenhouse and nursery
<i>(billions of \$)</i>				
1990	17.8	4.4	3.9	—
2000	27.2	7.3	6.2	2.8
2010	37.5	13.5	6.7	3.8
2020	49.1	20.6	7.8	6.3
<i>(percent increase)</i>				
1990–2000	53%	66%	59%	—
2000–2010	38%	85%	8%	36%
2010–2020	31%	53%	16%	66%
1990–2020	176%	368%	100%	—

*Source:* CDFA 2023.

Combined crop and crop-support employment accounts for over 90% of California's agricultural employment.

## An increasing need for labor

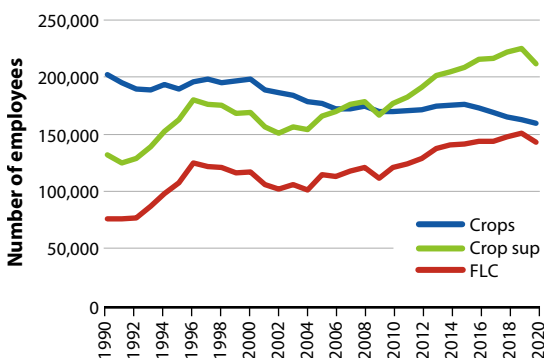
Many FVH commodities are labor intensive, so expanding production increases the employment of farmworkers. Rather than hiring workers directly, many farmers are turning to crop support service firms. These are nonfarm businesses that bring workers to farms to accomplish specific tasks. For example, farmers may rely on labor contractors to bring crews of workers for a few weeks to prune, thin, or harvest their crops. Contractors may be the sole employers of

the workers they bring to farms under some labor laws, such as unemployment insurance and workers' compensation, and joint employers with farms under others, such as the Agricultural Labor Relations Act.

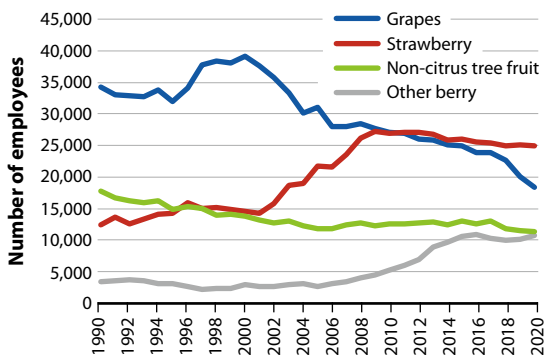
Over the past three decades, California farmers hired 20% fewer workers directly, reducing average direct-hire employment in crops (NAICS 111) from 203,000 to 160,000. Meanwhile, crop-support employment (NAICS 1151) rose by 60%, from an average of 132,000 in 1990 to 212,000 in 2020. Combined crop and crop-support employment accounts for over 90% of California's agricultural employment. Within crop-support employment (NAICS 1151), the farm labor contractor (NAICS 115115) share of average crop-support employment rose from 60% to 67% (fig. 3).

FVH commodities account for 90% of direct-hire crop employment, including 55% for fruits and nuts, 20% for vegetables and melons, and 15% for greenhouses and nurseries.

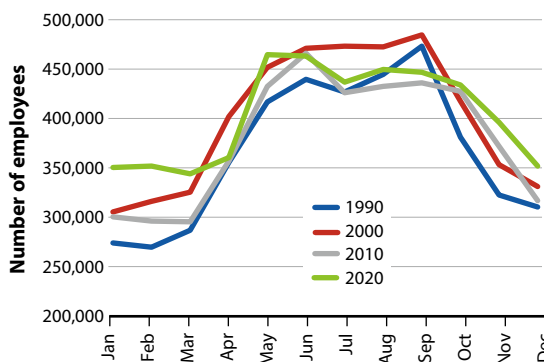
Employers are assigned to the NAICS code that represents the majority of their sales, so grape vineyards can be distinguished from strawberry, other berry, and non-citrus tree fruit farms. These four types of farms account for almost three-fourths of direct-hire crop employment. Between 1990 and 2020, average direct-hire employment in grapes fell by almost half; strawberry employment doubled; employment in other berries such as blueberries and raspberries tripled; and average employment in non-citrus tree fruits such as peaches, nectarines, and plums fell by a third (fig. 4). Note that there is no commodity information for workers brought to farms by labor contractors.



**FIG. 3.** California crop, crop support, and FLC employment, 1990–2020.



**FIG. 4.** Average employment in grapes, strawberries, other berries, and tree fruit, 1990–2020.



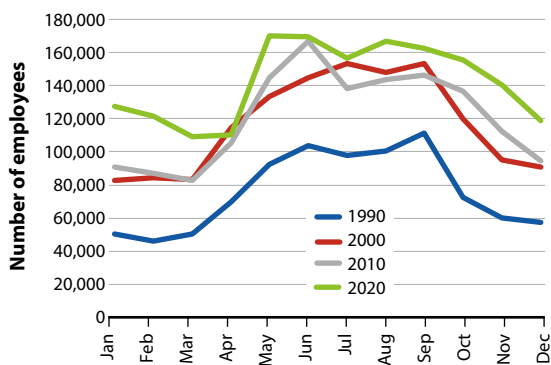
**FIG. 5.** Employment by month in California agriculture, 1990–2020.

## Longer seasons statewide

The gaps between peak and trough months of agricultural employment are shrinking. Between 1990 and 2000, average agricultural employment rose by almost 10%, from 367,000 to 400,000, and rose especially fast during the winter and spring months, reducing the peak-trough ratio from 1.8 in 1990 to 1.6 in 2000 (fig. 5). Between 2000 and 2010, average employment fell from 400,000 to 380,000, and the peak-trough ratio remained at 1.6. Between 2010 and 2020, average employment rose above 400,000, and the peak-trough employment ratio fell to 1.4. Average employment rose during the winter months and was stable during the summer months.

Declining seasonality was accompanied by a rising share of farm labor contractor employment; the farm labor contractor share of the state's average agricultural employment rose from 20% to 35% between 1990 and 2020 (fig. 6). The largest jump in the FLC share of agricultural employment occurred in the 1990s, when there was an influx of undocumented Mexican workers seeking jobs at a time of low U.S. unemployment.

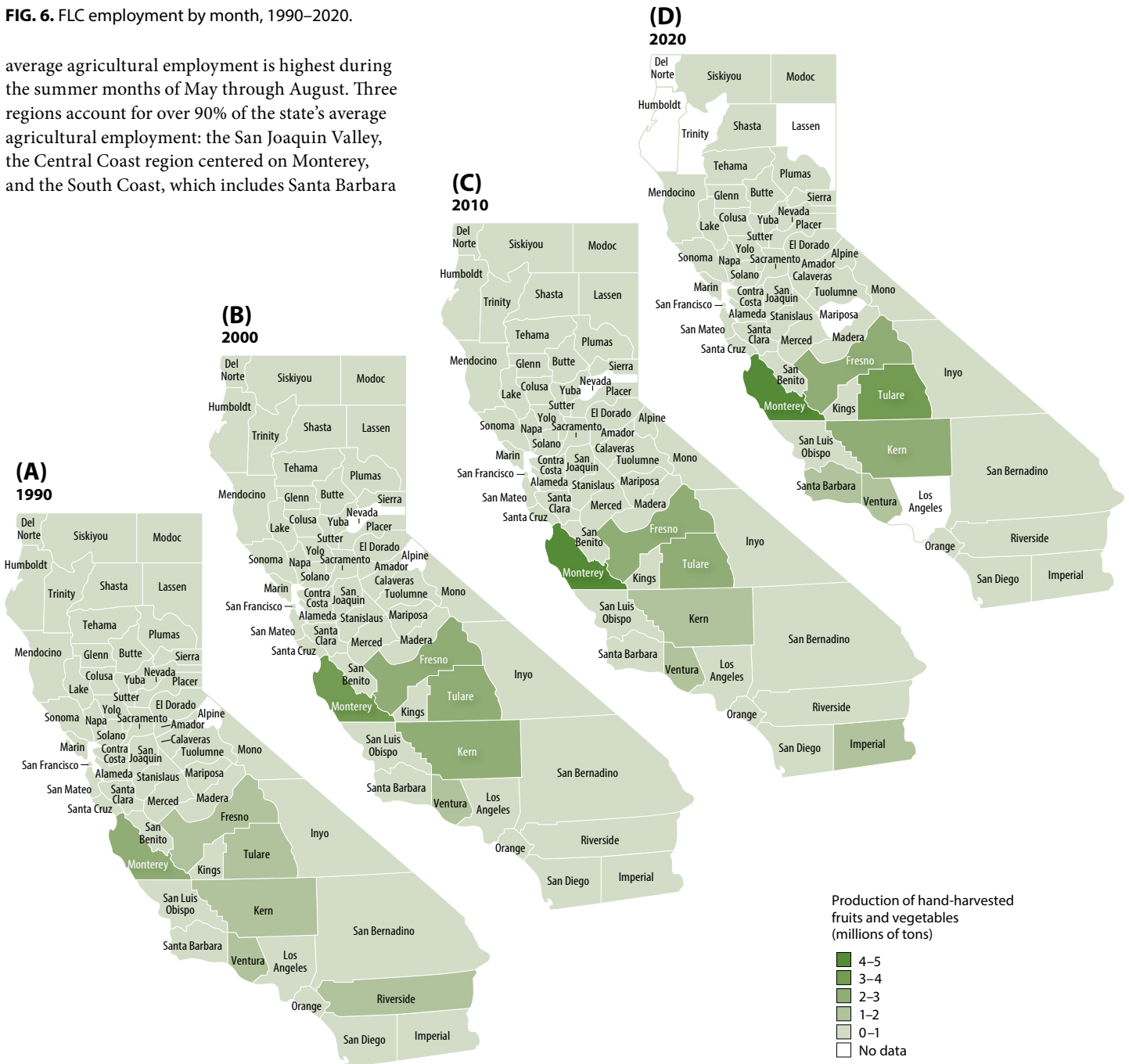
The FLC share of California agricultural employment was stable between 2000 and 2010, but jumped between 2010 and 2020. The FLC share of the state's



**FIG. 6.** FLC employment by month, 1990–2020.

average agricultural employment is highest during the summer months of May through August. Three regions account for over 90% of the state's average agricultural employment: the San Joaquin Valley, the Central Coast region centered on Monterey, and the South Coast, which includes Santa Barbara

and Ventura counties. Monterey County was the leading producer of hand-harvested fruits and vegetables in 1990, and was joined in 2000 by Fresno, Kern, and Tulare counties (fig. 7). Monterey continued to lead in hand-harvested fruits and vegetables in 2020 with over 4 million tons, but Fresno, Kern, and Tulare also expanded to each produce more than 2 million tons of hand-harvested fruits and vegetables. This helps explain rising farm employment and reduced seasonality.



**FIG. 7.** Hand-harvested fruits and vegetables by county, in millions of tons, in (A) 1990, (B) 2000, (C) 2010, and (D) 2020. Source: USDA 2023.



Almost half of average agricultural employment in the San Joaquin Valley is with farm labor contractors.

## SJV: Longer-term employment

The San Joaquin Valley, from San Joaquin in the north to Kern County in the south, accounts for half of the state's average agricultural employment. SJV average agricultural employment rose from 170,000 in 1990 to 200,000 in 2000, dipped to 185,000 in 2010, and was almost 200,000 in 2020.

Seasonality often increases in smaller geographic areas, but the peak-trough employment ratio fell more in the SJV than it did statewide. The SJV peak-trough ratio fell from 2.2 in 1990 to 1.4 in 2020, more than the drop in the California peak-trough ratio, which fell from 1.8 to 1.4 over these three decades (fig. 8).

Almost half of average agricultural employment in the San Joaquin Valley is with farm labor contractors, which explains why the SJV has a higher share of the state's FLC employment than of overall agricultural employment. The SJV had over 60% of California's FLC employment in 2020, versus 50% of the state's agricultural employment.

Average FLC employment in the SJV rose sharply between 1990 and 2000, was stable between 2000 and 2010, and rose between 2010 and 2020, when FLC employment was 45% of the SJV's average agricultural employment. The FLC share of SJV agricultural employment is highest during the summer months and lowest in April (fig. 9).

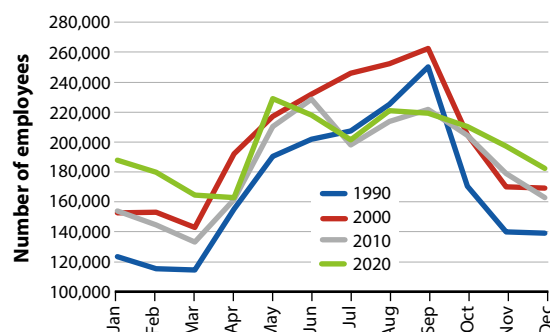


FIG. 8. Agricultural employment in the San Joaquin Valley, 1990–2020.

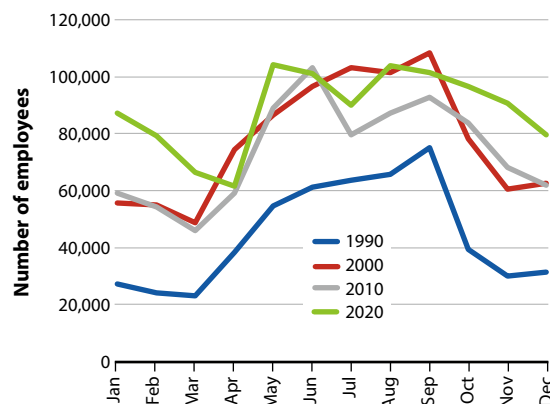


FIG. 9. FLC employment in the San Joaquin Valley, 1990–2020.

## Central Coast: More seasonality

This region includes Monterey County — the U.S. salad and berry bowl. Average employment in Central Coast agriculture rose from 54,000 in 1990 and 2000 to 70,000 by 2020, or a sixth of California's agricultural employment, reflecting more strawberry acreage.

Seasonality is more pronounced in the Central Coast than in the SJV, peaking in July 2020 at 89,000 and reaching a low of 46,000 in January 2020 for a peak-trough ratio of 1.9 (fig. 10). This is significantly higher than the 1.4 peak-trough ratio in the SJV.

The farm labor contractor share of Central Coast agricultural employment rose sharply between 1990 and 2020. In 1990, FLC average employment was one-sixth of Central Coast agricultural employment; by 2020, the FLC share was a third. Peak FLC employment in the Central Coast was 31,000 in June and July 2020, while trough employment was 15,000 in December 2020, a FLC peak-trough ratio of 2.1 (fig. 11).

## South Coast: Slower growth

The South Coast region, which includes the six coastal counties from San Luis Obispo in the north to San Diego in the south, had average agricultural employment of 70,000 in 2020, the same as the Central Coast.

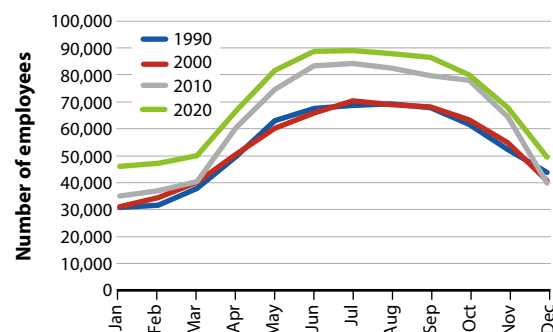


FIG. 10. Agricultural employment in the Central Coast, 1990–2020.

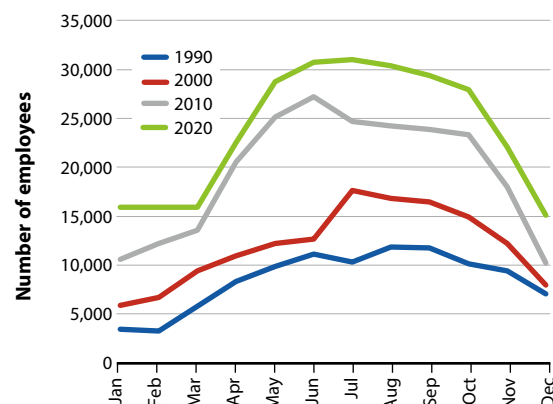


FIG. 11. FLC employment in the Central Coast, 1990–2020.

However, growth in average agricultural employment was slower in the South Coast than in the Central Coast over the past three decades (fig. 12).

Farm labor contractors play a relatively small but growing role in South Coast farm labor markets. The FLC share of average agricultural employment rose from less than 10% in 1990 to almost a quarter by 2020. FLC seasonality in the South Coast is similar to FLC seasonality in other regions. There were 180 workers employed by FLCs in June 2020 for each 100 workers employed by FLCs in December (fig. 13).

## Employment in berries doubles

Strawberries (NAICS 111333) and other berries (NAICS 111334) are among the most labor-intensive commodities grown in California. Their production doubled and tripled over the past three decades (Calvin et al. 2022). The state's strawberries were worth \$2 billion in 2020, raspberries were worth \$405 million, and blueberries were worth \$215 million, for total berry sales of over \$2.6 billion.

California's average employment in berries more than doubled from 16,000 to 36,000 between 1990 and 2020, while seasonality as measured by employment peak-trough ratios declined from 5.9 to 2.5 (fig. 14). In 1990, berry employment was lowest at 5,000 in January and highest at 28,000 in May. In 2020, January was still the trough month; just under 20,000 workers were employed, compared with 49,000 in June. Berry employment in January tripled between 1990 and 2020 and doubled in May and June.

The upsurge in winter and total berry employment is evident in a comparison of the largest sectors of employment in fruit and nut agriculture. In 1990, California fruit and nut employment peaked at 139,000 in September, including 67,000 in grapes, 34,000 in tree fruit, and 16,000 in berries. By 2020, California fruit and nut employment peaked at 108,000 in June, including 49,000 in berries, 20,000 in grapes, and 19,000 in tree fruit.

There were four workers in grapes for each berry worker in 1990, and 2.5 workers in berries for each grape worker in 2020. Note that some of the decline in grape and tree fruit employment may be due to employers switching from hiring workers directly to hiring them via FLCs; no data are collected on the commodities where FLC employees work.

The Central Coast and South Coast regions accounted for 98% of average berry employment in 2020, including 60% in the South Coast and 38% in the Central Coast. The South Coast share of average berry employment rose from 50% in 1990 to 60%, in 2020, in part due to the expansion of berry production in the Santa Maria area of Santa Barbara County.

## Stable farm employment

Over the past three decades, average employment in California agriculture (NAICS 11) rose by 10% to 404,000, while seasonality declined due to more employment during the winter months. The ratio of monthly peak to monthly trough employment fell from 1.8 in 1990 to 1.4 in 2020, reflecting 474,000 workers employed in September 1990 and 270,000 in February 1990, compared with 470,000 workers employed in May 2020 and 346,000 in March 2020.

Many farming operations that hire large numbers of workers have year-round workforces comprised of local workers; they turn to contractors to bring local

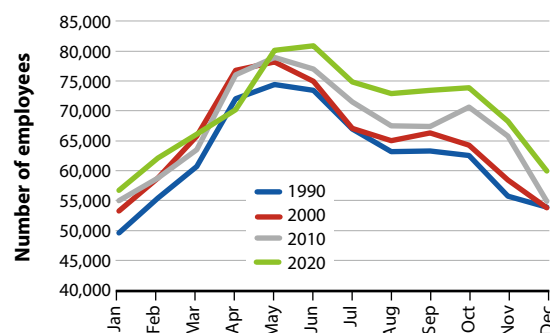


FIG. 12. Agricultural employment in the South Coast, 1990–2020.

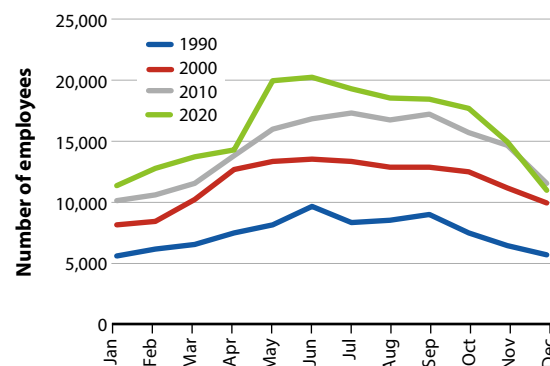


FIG. 13. FLC employment in the South Coast, 1990–2020.

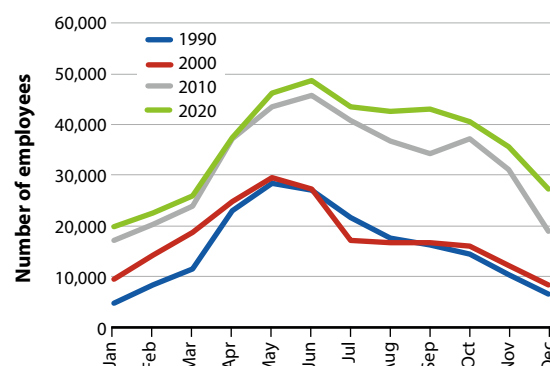


FIG. 14. California berry employment, 1990–2020.

and H-2A workers to their farms to perform specific seasonal tasks. The FLC share of California agricultural employment rose from 20% in 1990 to 35% in 2020. FLC employment is more seasonal, with a statewide peak-trough employment ratio of 1.6 in 2020, higher than the 1.4 employment ratio for all agricultural employment.

The San Joaquin Valley accounts for half of California's agricultural employment, and seasonality in the valley declined faster than statewide. The SJV has over 60% of California's FLC employment, and FLC employment in the SJV is slightly more seasonal than statewide. There were 170 workers employed by FLCs in the SJV in September 2020 for each 100 employed in April 2020.

The Central Coast, centered on Monterey County, accounts for one-sixth of California's agricultural employment, and its farm employment is more seasonal than in the SJV. For each 190 workers employed in June and July 2020 in the Central Coast, 100 were employed in January 2020. FLCs accounted for one-third of the 70,000 average agricultural jobs in the Central Coast in 2020, up from 20% in 1990.

The South Coast region from San Luis Obispo to San Diego has the same average employment as the Central Coast, about 70,000, and experienced less growth between 1990 and 2020, up 12% versus a 30% increase in the Central Coast. The FLC share of agricultural employment in the South Coast more than doubled from 1990 to 2020, reaching almost a quarter of farm employment.

The SJV, Central Coast, and South Coast accounted for 49%, 17%, and 17% of the state's average agricultural employment of 404,000 in 2020, respectively, or a total of 83%. These three regions accounted for 63%, 17%, and 11%, respectively, of the state's average FLC employment of 142,500, or 91% of the state's total FLC employment.

The trends highlighted by this analysis — stable farm employment, decreased seasonality, and more

workers brought to farms by labor contractors — seem poised to continue. A growing share of the workers brought to farms by labor contractors are H-2A guest workers (DOL 2022), whose costs are higher because H-2A workers must be provided transportation and housing at no cost and paid an Adverse Effect Wage Rate of \$18.65 an hour in 2023, when the minimum wage was \$15.50 an hour. A major challenge for the state's agriculture is to ensure that H-2A workers are productive enough to justify their higher costs, which are offset in part by payroll tax savings and by the fact that H-2A workers ensure that farm work is done on time.

## Workforce challenges

While a more reliable work force benefits farmers, the division between local and H-2A workers raises some challenges. In the nonfarm economy, the process of creating a core of directly hired workers supplemented by contract workers to perform specific tasks is called hollowing out or fissuring. This can be seen in manufacturers and service firms from banks to hotels. Fissured workplaces raise questions about who is responsible for labor law violations (Weil 2019). They may polarize workforces into high- and low-wage components that limit opportunities for upward mobility (Autor 2019). Workers brought to workplaces by contractors often earn lower wages and have fewer opportunities to climb the job ladder than workers who are directly hired, which may complicate farm labor force management in the future. [CA](#)

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*Z. Rutledge is Assistant Professor in the Department of Agricultural, Food, and Resource Economics at Michigan State University; P. Martin is Professor Emeritus in the Department of Agricultural and Resource Economics at the University of California, Davis.*

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