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Abstract

USDA's Census of Agriculture, conducted every 5 years, collects data on farm labor expenses, with details for both contract and hired labor by agricultural industry, location, and farm size (as measured by sales). These data, when adjusted for inflation, reveal that total farm labor expenses, production expenses, and sales of agricultural products all increased in real terms from 1997 to 2022. Two measures of labor intensity, the ratio of labor expenses to total production expenses (labor-to-total-expenses) and the ratio of labor expenses to total agricultural sales (labor-to-sales), showed no clear upward or downward trend at the national level during this period. However, consistent with other evidence of a recent tightening of farm labor markets, between 2012 and 2022 the labor-to-total-expenses ratio increased overall and in virtually all industries, particularly those where the ratio was initially high. The increase in the labor-to-sales ratio was more muted nationally, but the change in this ratio varied more across industries. The increase in this ratio was particularly large (more than 5 percentage points) for two industries: tobacco and fruit and tree nuts. Otherwise, the distribution of labor expenses by industry, U.S. State, and farm size changed relatively little over the past several Censuses.

Keywords: labor expenses, farm labor, farmworkers

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Farm Labor Expenses: Evidence from the 1997–2022 Census of Agriculture Data

Introduction

The initial release of data from the 2022 Census of Agriculture in February 2024 (the data were collected in 2022 and the Census was released in 2024) provides a fresh look at U.S. agriculture's labor expenses. The Census of Agriculture, conducted every 5 years by USDA's National Agricultural Statistics Service (NASS), aims to provide a complete count of all farms where $1,000 or more of agricultural products were raised and sold, or normally would have been sold, during the census year. The Census collects data on land use and ownership, the characteristics of farm operators, production practices, and farm income and expenditures. Among the expenditure data is information on labor expenses, with details for both contract and hired labor by agricultural industry, location, and farm size (as measured by sales of agricultural products). When the data from the 2022 Census of Agriculture are combined with data from previous Censuses, they offer insights into how labor costs have changed over time and in relation to sales of agricultural products and total operational expenses.

The publicly available *QuickStats* database (USDA, NASS, 2024a) and the *United States Summary and State Data* reports published by USDA, NASS (1999, 2004, 2009, 2014, 2019, 2024b) offer a means for accessing numerous tabulations of data from not only the 2022 Census of Agriculture but also the five previous Censuses conducted since 1997.[1] Sales and production expenditure data, including expenditures on labor, are available at the State and national level. Farms in the Census of Agriculture are categorized by industry using the North American Industrial Classification System (NAICS),[2] reflecting the production specialty of each individual farm, and by size according to total sales of agricultural products.

This wealth of data presents an opportunity to explore the critical importance of farm labor to U.S. agriculture. Labor is a key input in virtually all agricultural production. However, for more than a decade, the supply of farm labor in the United States has shown signs of tightening, which has made

[1] Responsibility for carrying out the Census of Agriculture was first assigned to USDA, NASS in 1997. For details on this assignment, see USDA, NASS (1999). For information on the history of the Censuses of Agriculture conducted prior to 1997, see U.S. Department of Commerce, Bureau of the Census (2024, October 16).

[2] The North American Industry Classification System (NAICS) is "the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy…. It was developed jointly by the U.S. Economic Classification Policy Committee (ECPC), Statistics Canada, and Mexico's Instituto Nacional de Estadística y Geografia (INEGI), to allow for a high level of comparability in business statistics" of the United States, Canada, and Mexico (U.S. Department of Commerce, Bureau of the Census, 2024, November 20). A farm is classified in an industry when the products associated with that industry accounted for at least one-half of the value of the farm's production. For instance, a farm that obtained at least half of its production from crop production would first be classified in the crop production subsector. If that same farm obtained at least half of its production from soybean farming it would be classified as belonging to that industry. A farm in the crop production subsector that did not obtain at least half of its production from a specific industry would be classified as belonging to the industry all other crop farming.

farm labor a growing concern among farmers, policymakers, and agricultural researchers (Hertz & Zahniser, 2013; Charlton & Taylor, 2016; Richards, 2018; Ferguson, 2022; U.S. House of Representatives, Committee on Agriculture, 2024; Rutledge, 2024; Simnitt & Castillo, 2025). Evidence that U.S. farm labor markets are tightening includes the increased use of the H-2A Temporary Agricultural Workers program, farm wages rising faster than nonfarm wages, and widespread reports of labor shortages, particularly in labor-intensive industries, which are most vulnerable to a falling labor supply.[3] [4]

Labor Expenses, Total Production Expenses, and Sales of Agricultural Products—National Analysis

This section shows changes at the national level over the past quarter century (1997–2022) in sales of agricultural products, total production expenses, and labor expenses. The section also examines two key measures of U.S. agriculture's labor intensity—the ratio of labor expenses to total production expenses (labor-to-total-expenses ratio) and the ratio of labor expenses to total sales of agricultural products (labor-to-sales ratio)—which capture the extent to which an industry relies on labor rather than on land, capital, or other inputs.[5] Labor-intensive industries are expected to be more sensitive to fluctuations in labor costs, such as those resulting from a tightening labor market. In this report, the primary focus is on labor expenses, with less emphasis on land, capital, and other inputs.[6]

Sales of agricultural products are the primary source of income for the Nation's agricultural sector, accounting for roughly 90 percent of the sector's annual income (USDA, Economic Research Service (ERS), 2024). Other sources of income include the sale of forest products, the provision of machine hire and custom work, and direct government payments, all of which are less related than the sales of agricultural products to a farm operation's labor expenses. Total production expenses encompass more than a dozen expense categories, including feed; livestock, poultry, and related expenses; farm services; fertilizer, lime, and soil conditioners; and labor. Labor expenses include spending on both directly hired workers and indirectly hired workers secured via a contract with an intermediary.

Between 1997 and 2022, labor expenses, total production expenses, and total sales of agricultural products all experienced substantial growth at the national level (figure 1). In real terms (inflation-adjusted, 2023 dollars), labor expenses increased steadily, climbing from $32.6 billion to $53.8 billion, total production expenses increased from $278.2 billion to $439.6 billion, and sales of agricultural

[3] Many factors have been proposed as explanations for this decline, including falling fertility rates and improved economic conditions in Mexico (the main country of origin for foreign-born farmworkers in the United States) and the slowing of unauthorized immigration from Mexico due to stronger enforcement of U.S. immigration laws (Zahniser et al., 2018).

[4] In some parts of U.S. agriculture, such as the production of labor-intensive specialty crops, labor is consistently the highest variable production expense (Calvin et al., 2022).

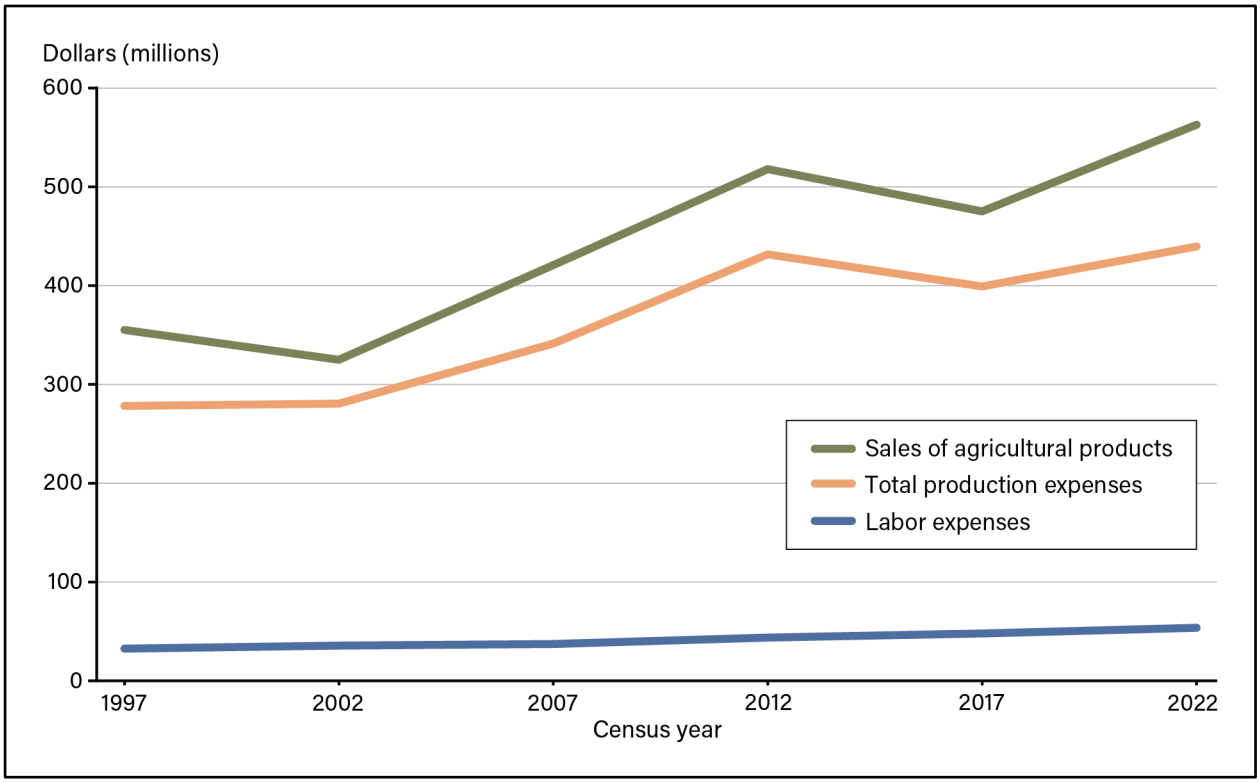
[5] See Kenton (2020) for a definition of labor intensity.

[6] It is important to note that there is no optimal level of labor intensity. Instead, standard microeconomic theory suggests that firms choose an optimal mix of inputs to minimize the cost of producing a given level of output (Emerson, 2019).

products grew $355.2 billion to $562.8 billion.[7] Labor expenses accounted for 13.1 percent of the increase in total production expenses—a percentage that approximately equals labor's share of total production expenses in each Census of Agriculture year examined (figure 1).[8]

Figure 1

Farm labor expenses, sales of agricultural products, and total production expenses by census year in real (inflation-adjusted) terms (1997–2022)



Note: Nominal values (not inflation adjusted) are converted to real values (inflation adjusted) using Gross Domestic Product (GDP) price indexes.
Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture and U.S. Department of Commerce, Bureau of Economic Analysis, GDP price indexes.

One way to measure the labor intensity of U.S. agriculture is the ratio of labor expenses to total production expenses (labor-to-total-expenses; reading from left to right, the first bar for each year in figure 2). This ratio fluctuated between 10 and 13 percent between 1997 and 2022 and roughly followed a U-shaped pattern marked by lower percentages in 2007 and 2012. After peaking at 12.7

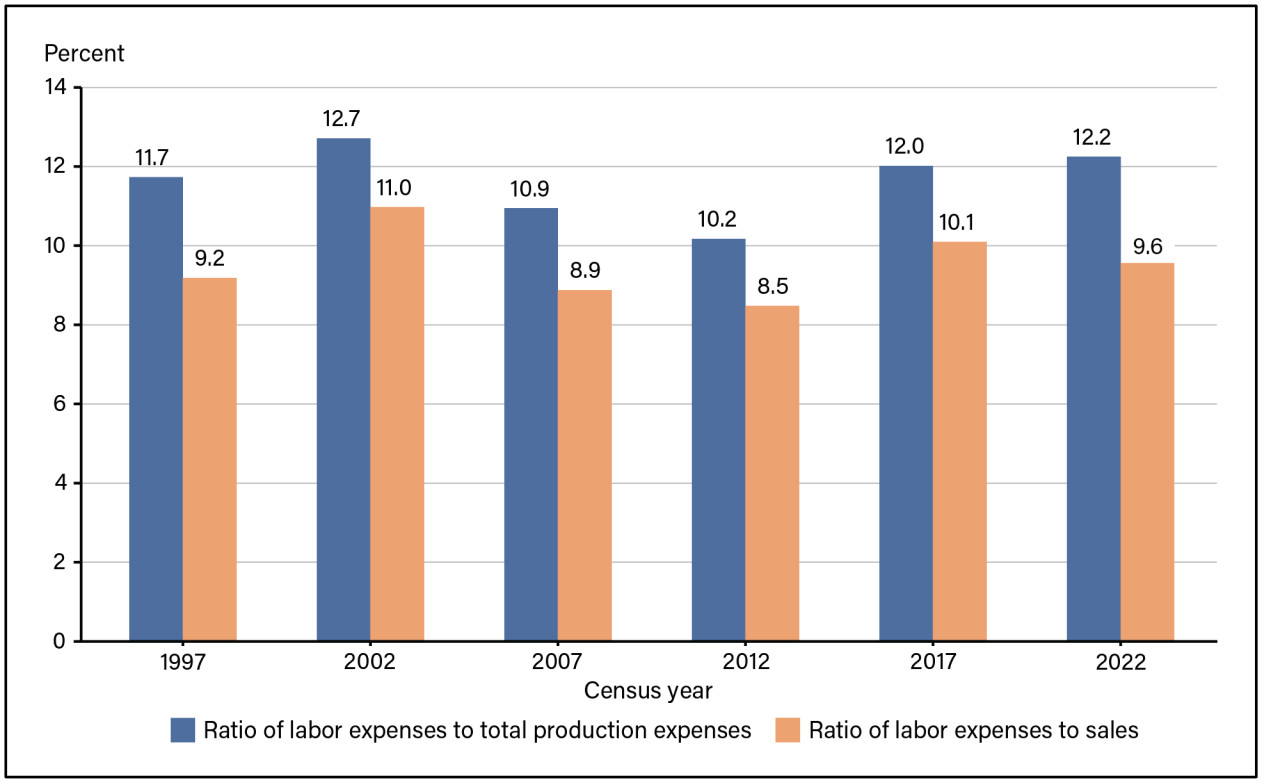
[7] In nominal terms (not inflation-adjusted), labor expenses increased from $18.5 billion to $51.9 billion, total production expenses grew from $157.8 billion to $424.1 billion, and sales of agricultural products expanded from $201.4 billion to $543.1 billion.

[8] Another source of employment data is the *Quarterly Census of Employment and Wages* (QCEW), produced by the U.S. Department of Labor, Bureau of Labor Statistics (2025). The total wages from the QCEW for the NAICS codes for crop production, animal production and aquaculture, support activities for crop production, and support activities for animal production for the years 2002–2022 roughly correspond to the Census of Agriculture's labor expense data for crop production and animal production for these years. For instance, the QCEW's total for 2022 was $50.1 billion, compared with the Census of Agriculture's total of $51.9 billion (nominal values, i.e., not adjusted for inflation). The QCEW's total for just crop production and animal production, however, was much smaller, at $35.2 billion.

percent in 2002, the ratio fell to 10.9 percent in 2007 and 10.2 percent in 2012. In 2017, this downward trend reversed itself, and the ratio reached 12.0 percent in 2017 and 12.2 percent in 2022. Overall, the labor-to-total-expenses ratio saw net increases of 0.5 percentage points between 1997 and 2022 and 2.1 percentage points between 2012 and 2022.

Figure 2

Ratios of labor expenses to sales of agricultural products and labor expenses to total production expenses by census year (1997–2022)



Note: Calculations made using this figure's data labels may not precisely match calculations presented in the text due to rounding.

Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

Another way to measure the labor intensity of agriculture is the ratio of labor expenses to sales of agricultural products (labor-to-sales; reading from left to right, the second bar for each year in figure 2). The labor-to-sales ratio tends to be about 2 percentage points less than the labor-to-total-expenses ratio. The reason is because sales (the denominator in the labor-to-sales ratio) tend to be larger than total production expenses (the denominator in the labor-to-total-expenses ratio). The labor-to-sales ratio fluctuated between 8 and 11 percent over the period examined and followed a similar U-shaped pattern as the labor-to-total-expenses ratio, reaching its lowest levels in 2007 and 2012. The labor-to-sales ratio increased from 1997 to 2002, declined from 2002 to 2012, and rose again from 2012 to 2022, although it slightly decreased between 2017 and 2022. After peaking at 11.0 percent in 2002, the ratio fell to 8.9 percent in 2007 and 8.5 percent in 2012. In 2017, this downward trend reversed itself, and the ratio reached 10.1 percent in 2017 and 9.6 percent in 2022. Overall, the labor-to-sales ratio saw net increases of 0.4 percentage points between 1997 and 2022 and 1.1 percentage points between 2012 and 2022.

Note that the two labor-intensity measures presented depend not only on the cost of labor but also on other factors such as the cost of other inputs, output prices, and technology. As a result, it is not straightforward to attribute changes in labor intensity solely to changes in wage rates. Nonetheless, wage data from USDA's *Farm Labor Survey* show that periods with rising labor-to-total-expense ratios were accompanied by higher real wage growth (13.1 percent from 1997 to 2002, 7.6 percent from 2012 to 2017, and 12.9 percent from 2017 to 2022) compared with periods when this ratio declined (1.4 percent from 2002 to 2007 and 5.5 percent from 2007 to 2012) (nominal wage data from USDA, NASS (2024a) converted to real values using price indexes from U.S. Department of Commerce, Bureau of Economic Analysis (2024)). It is important to note, however, that wage increases may not necessarily lead to higher labor intensity if farms can strongly substitute away from labor and into other inputs as wages rise.

Labor Expenses, Total Production Expenses, and Sales of Agricultural Products—Industry Analysis

This section explores differences in labor expenses and labor intensity across agricultural industries in 2022, as well as changes in labor intensity across these industries between 1997 and 2022.[9]

Five Industries Accounted for More than 70 Percent of Agriculture's Labor Expenses

Farm labor expenses in 2022 were concentrated in five industries: fruit and tree nut farming (with 23.3 percent of agriculture's total); nursery, greenhouse, and floriculture (13.8 percent); oilseed and grain farming (13.0 percent); vegetable and melon farming (12.3 percent); and dairy cattle and milk production (11.2 percent) (table 1). Together, these five industries accounted for 73.6 percent of total labor expenses in agriculture in 2022, compared with 70.7 percent in 2012 and 69.3 percent in 1997 (data for 2012 and 1997 are not shown in table 1).

[9] Beginning with the 1997 Census of Agriculture, NASS has used statistical techniques to correct for under-coverage (farms missing from NASS's list of all farms). However, these corrections were not made to the industry-level data on farm expenses and farm sales until the 2002 Census of Agriculture. Thus, the industry-level data from the 1997 Census of Agriculture are not strictly comparable with corresponding data from later Censuses of Agriculture. See USDA, NASS (2004: pp. X, 6–7) and Young (2014) for more information on these corrections.

Table 1

Farm labor expenses and sales of agricultural products by industry, 2022

Sector	Labor expenses	Share of total	Sales of agricultural products	Share of total	Labor expenses as a percentage of sales
	Nominal dollars (billions)	Percent	Nominal dollars (billions)	Percent	Percent
Agriculture, total	51.9	100.0	543.1	100.0	9.6
Oilseed and grain farming (1111)	6.8	13.0	163.8	30.2	4.1
Vegetable and melon farming (1112)	6.4	12.3	28.8	5.3	22.2
Fruit and tree nut farming (1113)	12.1	23.3	33.6	6.2	36.0
Nursery, greenhouse, and floriculture (1114)	7.1	13.8	21.8	4.0	32.8
Other crop farming (1119)	4.0	7.7	28.1	5.2	14.2
Tobacco farming (11191)	0.2	0.3	0.7	0.1	24.0
Cotton farming (11192)	0.4	0.8	5.2	1.0	7.8
Sugarcane, hay, and all other crop farming (11193, 11194, and 11199)	3.4	6.5	22.2	4.1	15.3
Beef cattle ranching and farming (112111)	2.7	5.2	36.0	6.6	7.5
Cattle feedlots (112112)	0.8	1.6	45.9	8.4	1.8
Dairy cattle and milk production (11212)	5.8	11.2	60.4	11.1	9.7
Hog and pig farming (1122)	1.4	2.8	37.7	6.9	3.8
Poultry and egg production (1123)	2.3	4.4	77.9	14.3	3.0
Sheep and goat farming (1124)	0.2	0.3	1.0	0.2	15.7
Aquaculture and other animal production (1125 and 1129)	2.3	4.5	8.3	1.5	28.2

Note: The numbers in parentheses behind the names of agricultural industries are North American Industry Classification System (NAICS) codes.
Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

Census Data for 2022 Reveal Five Main Labor-intensive Industries

In 2022, five agricultural industries stood out as being highly labor intensive under both measures of labor intensity, highlighting the labor-intensive nature of their production processes relative to other agricultural industries (tables 2 and 3). The industry with the highest labor-to-total-expenses ratio was nursery, greenhouse, and floriculture (42.5 percent), followed by fruit and tree nut farming (40.4 percent), vegetable and melon farming (29.2 percent), tobacco farming (27.4 percent), and aquaculture and other animal production (20.7 percent). When focusing on the labor-to-sales ratios, the rankings shifted slightly, with the 5 highest ratios being fruit and tree nut farming (36.0 percent); nursery, greenhouse, and floriculture (32.8 percent); aquaculture and other animal production (28.2 percent); tobacco farming (24.0 percent); and vegetable and melon farming (22.2 percent).

Labor intensity was much lower in many other industries. For example, the labor-to-sales ratio was less than 10 percent for oilseed and grain farming (4.1 percent), cotton (7.8 percent), beef cattle ranching and farming (7.5 percent), cattle feedlots (1.8 percent), hog and pig farming (3.8 percent), and poultry and egg production (3.0 percent). Since oilseed and grain farming and beef cattle ranching and farming account for such a large share of the value of total U.S. agricultural production, it is understandable that the relatively low labor-to-sales ratios in these industries bring the aggregate cost share down to 10 percent or less.

The labor intensity of an agricultural industry depends in part on the industry's requirements for manual labor and the extent to which specific stages of production can be or have been mechanized. In the broad category of fruit and tree nuts; nursery, greenhouse, and floriculture; and vegetables and melons (sometimes referred to as specialty crops), many products require substantial manual labor in multiple stages of production, including planting, weeding, harvesting, and postharvest (Castillo et al., 2021). For many specialty crops, mechanization technology is not yet available. In the dairy industry, although some farms have adopted automatic milking systems (AMS), many continue to rely on traditional methods. In a 2023 survey conducted by Gutierrez-Li et al. (2024), of 650 dairy farms in Minnesota and Wisconsin, just 39 farms responded they were using AMS. In contrast, the cultivation of grains and oilseeds tends to be capital intensive, as most stages of production from planting to harvest are mechanized (Nolte & Ostermeier, 2017).

Labor Intensity Increased in Some Agricultural Industries Between 1997 and 2022

The U-shaped pattern in the labor-to-total-expenses ratios of U.S. agriculture overall (figure 2) can be seen in many agricultural industries (table 2). As was the case for agriculture overall, this ratio saw a net increase between 1997 and 2022 in oilseed and grain farming; tobacco farming; sugarcane, hay, and all other crop farming; beef cattle ranching and farming; dairy cattle and milk production; poultry and egg production; sheep and goat farming; and aquaculture and other animal production. The industries that saw the three highest percentage-point increases over the 1997–2022 period were aquaculture and other animal production (up 8.9 percentage points), tobacco farming (up 6.3 percentage points), and dairy cattle and milk production (up 2.7 percentage points). The industries with the three largest decreases in the labor-to-total-expenses ratio were cotton farming (down 5.7 percentage points), vegetable and melon farming (down 2.6 percentage points), and hog and pig farming (down 1.6 percentage points).

Both the tobacco and dairy industries underwent substantial consolidation over the past quarter century, which may have resulted in the substitution of paid labor for unpaid family labor. In the tobacco industry, annual production fell by 75.3 percent (from 1.7 billion pounds to 432 million pounds) between 1997 and 2022 (USDA, NASS, 2024a), and the number of farms growing tobacco dropped from about 66,000 to about 1,400 (USDA, NASS, 1999, 2024b). Additionally, the real price received for tobacco (in 2023 prices) decreased from $3.18 to $2.30 per pound during this period. Still, the industry continues to rely on manual workers (including many from the H-2A program) to cut leaves and often to hang them for drying (Burris, 2024). In the dairy industry, the number of farms fell from about 86,000 in 1997 to about 23,000 in 2022 (USDA, NASS, 1999, 2024b), but annual milk production grew from 156 billion pounds to 226 billion pounds (USDA, NASS, 2024a).

As was the case for the labor-to-total-expenses ratio, the U-shaped pattern in the labor-to-sales ratio of U.S. agriculture overall (figure 2) can be seen in many agricultural industries (table 2). Several industries experienced particularly large net increases in the labor-to-sales ratio between 1997 and 2022 (table 3). The industries with the 4 highest percentage-point increases were aquaculture and other animal production (up 17.8 percentage points), tobacco farming (up 11.3 percentage points), sheep and goat farming (up 8.1 percentage points), and fruit and tree nut farming (up 7.8 percentage points). Four industries saw a decline in this percentage between 1997 and 2022: cotton farming (down 2.8 percentage points), hog and pig farming (down 1.2 percentage points), cattle feedlots (down 0.6 percentage points), and poultry and egg production (down 0.3 percentage points).

Table 2

Labor's share of total production expenses by production specialty, 1997–2022 Censuses of Agriculture

Census year	Agriculture, total	Oilseed and grain farming (1111)	Vegetable and melon farming (1112)	Fruit and tree nut farming (1113)	Nursery, greenhouse, and floriculture (1114)	Other crop farming (1119)	Tobacco farming (11191)	Cotton farming (11192)
	Percent of total							
1997	11.7	5.7	31.8	40.5	43.8	15.8	21.2	14.6
2002	12.7	5.8	29.3	39.6	41.5	13.4	19.5	11.9
2007	10.9	4.5	28.3	38.7	40.1	11.9	23.0	9.7
2012	10.2	4.5	27.1	38.7	40.4	13.0	24.3	9.3
2017	12.0	5.4	28.8	38.5	43.0	13.8	24.9	10.5
2022	12.2	5.7	29.2	40.4	42.5	14.6	27.4	9.0
	Percentage points							
Change, 2022 versus 1997	0.5	0.03	-2.6	-0.05	-1.3	-1.2	6.3	-5.7

Census year	Sugarcane, hay, and all other crop farming (11193, 11194, and 11199)	Beef cattle ranching and farming (112111)	Cattle feedlots (112112)	Dairy cattle and milk production (11212)	Hog and pig farming (1122)	Poultry and egg production (1123)	Sheep and goat farming (1124)	Aquaculture and other animal production (1125 and 1129)
	Percent of total							
1997	15.3	6.0	2.8	10.5	6.8	3.9	8.2	11.8
2002	13.1	6.9	2.6	12.8	7.1	5.3	8.7	15.1
2007	11.7	6.3	2.3	11.9	5.4	3.7	6.9	14.0
2012	13.2	5.9	1.8	10.2	5.0	3.6	8.5	18.8
2017	14.0	7.0	2.3	12.4	6.3	5.7	8.3	19.6
2022	15.3	7.0	2.1	13.3	5.1	4.8	9.0	20.7
	Percentage points							
Change, 2022 versus 1997	0.1	0.9	-0.6	2.7	-1.6	1.0	0.8	8.9

Note: The numbers in parentheses behind the names of agricultural industries are North American Industry Classification System (NAICS) codes.
Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

Table 3

Labor expenses as a percentage of sales of agricultural products by production specialty, 1997–2022 Censuses of Agriculture

Year	Agriculture, total	Oilseed and grain farming (1111)	Vegetable and melon farming (1112)	Fruit and tree nut farming (1113)	Nursery, greenhouse, and floriculture (1114)	Other crop farming (1119)	Tobacco farming (11191)	Cotton farming (11192)
	Percent of sales							
1997	9.2	4.0	21.7	28.2	28.2	11.5	12.8	10.6
2002	11.0	5.0	20.5	31.0	28.9	13.4	16.5	11.0
2007	8.9	3.2	20.6	29.9	29.5	11.4	18.1	7.8
2012	8.5	3.3	22.2	30.5	31.6	12.0	18.0	8.0
2017	10.1	4.5	23.7	31.8	32.6	13.6	19.4	8.6
2022	9.6	4.1	22.2	36.0	32.8	14.2	24.0	7.8
	Percentage points							
Change, 2022 versus 1997	0.4	0.1	0.5	7.8	4.6	2.7	11.3	-2.8

Year	Sugarcane, hay, and all other crop farming (11193, 11194, and 11199)	Beef cattle ranching and farming (112111)	Cattle feedlots (112112)	Dairy cattle and milk production (11212)	Hog and pig farming (1122)	Poultry and egg production (1123)	Sheep and goat farming (1124)	Aquaculture and other animal production (1125 and 1129)
	Percent of sales							
1997	11.7	5.4	2.4	7.8	5.0	3.3	7.6	10.4
2002	13.8	7.0	2.5	10.4	6.5	3.8	12.6	19.8
2007	12.0	6.3	2.1	8.5	4.6	2.9	11.8	19.1
2012	12.6	6.2	1.7	8.1	4.1	2.9	13.0	30.6
2017	15.0	7.3	2.0	9.7	4.8	3.8	14.4	28.8
2022	15.3	7.5	1.8	9.7	3.8	3.0	15.7	28.2
	Percentage points							
Change, 2022 versus 1997	3.6	2.1	-0.6	1.9	-1.2	-0.3	8.1	17.8

Note: The numbers in parentheses behind the names of agricultural industries are North American Industry Classification System (NAICS) codes.
Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service Census of Agriculture.

The increase in the labor-to-sales ratio of fruit and tree nut farming may be linked to long-term changes in the product composition of this industry—for instance, switching toward products with higher labor requirements. While a full exploration of this topic is outside the scope of this report, it should be noted that the product composition of the value of U.S. fruit and tree nut production shifted away from citrus fruit and toward tree nuts between 1997 and 2022. In 1997, citrus fruit made up 20.1 percent of the total, noncitrus fruit 63.7 percent, and tree nuts 16.3 percent (percentages do not add up to 100.0 percent due to rounding). In 2022, these shares equaled 11.2 percent, 64.4 percent, and 24.4 percent, respectively (USDA, NASS, data, as compiled by USDA, ERS, 2025).

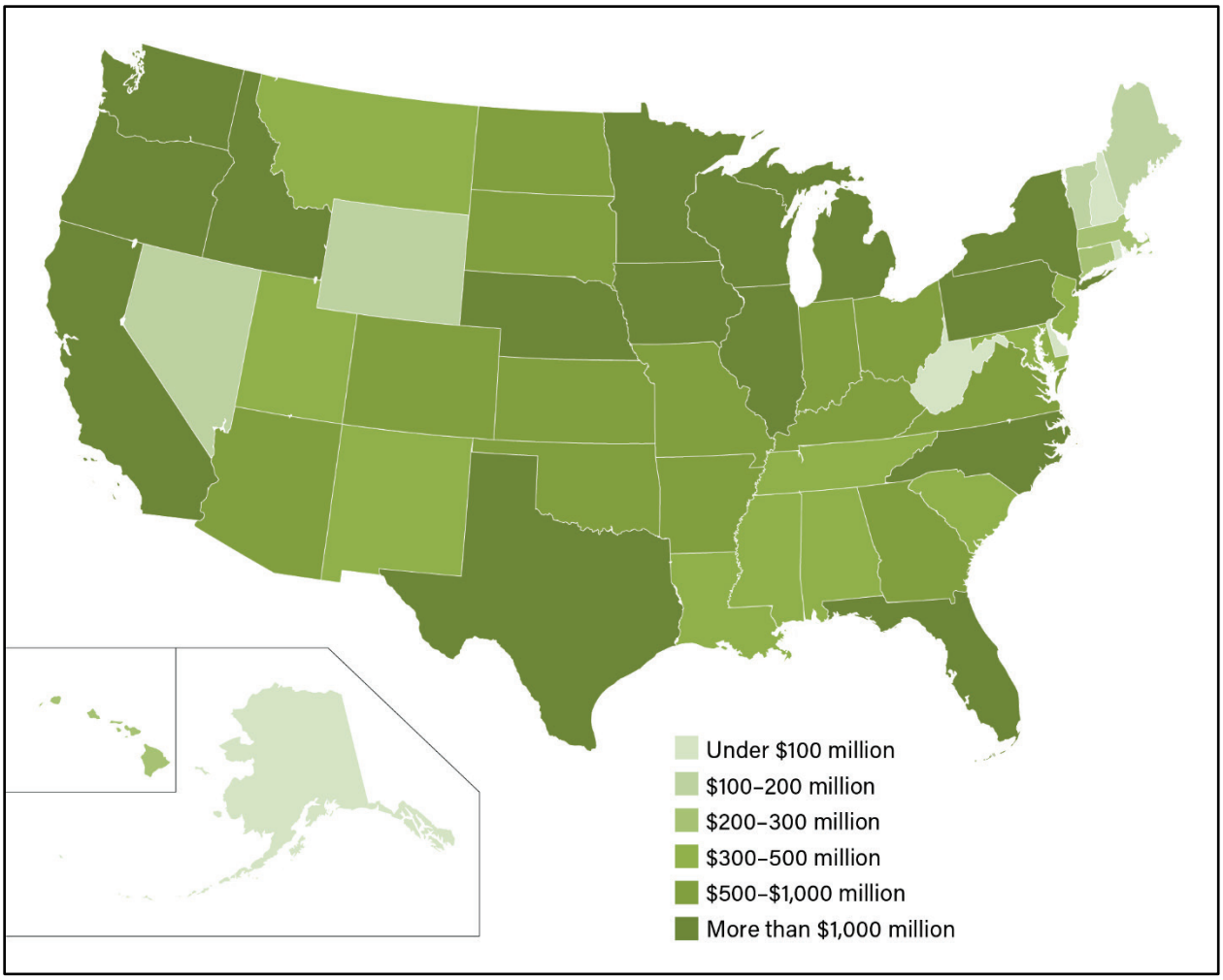
California Was the State With the Largest Amount of Farm Labor Expenses in 2022

The Census of Agriculture includes State-level data on total labor expenses, hired labor expenses, and contract labor expenses for each census year since 1997. In 2022, total farm labor expenses were concentrated in a handful of States, several of which are located either along the Pacific coast or in the Midwest (figure 3, table 4).[10] California was by far the State with the largest total farm labor expenses ($14.6 billion in nominal terms)—accounting for 28.13 percent of the national total—followed by Washington ($3.2 billion, 6.19 percent), Florida ($2.6 billion, 4.95 percent), Texas ($2.3 billion, 4.51 percent), Oregon ($1.6 billion, 3.17 percent), Wisconsin ($1.5 billion, 2.97 percent), and Michigan ($1.5 billion, 2.88 percent). These seven States accounted for just over half of U.S. farm labor expenses in 2022.

[10] Table 4 presents the full set of data used to construct several of the figures in this economic brief.

Figure 3

Total farm labor expenses by State, 2022



Note: Expenses are measured in nominal (not inflation-adjusted) dollars.
Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

Table 4

Farm labor expenses by State, 2022: hired, contract, and total

State	Hired	Contract	Total	State's share of national total	Contract's share of State total	Sales of agricultural products	Labor expenses divided by sales
	Nominal dollars (millions)			Percent		Nominal dollars (millions)	Percent
United States	41,809	10,128	51,936	100.00	19.50	543,087	9.56
Alabama	314	56	370	0.71	15.03	9,036	4.09
Alaska	30	2	32	0.06	6.71	91	35.38
Arizona	611	130	741	1.43	17.54	5,203	14.25
Arkansas	497	65	562	1.08	11.55	13,899	4.04
California	9,575	5,035	14,610	28.13	34.46	59,006	24.76
Colorado	675	84	759	1.46	11.07	9,223	8.23
Connecticut	200	17	217	0.42	7.66	704	30.80
Delaware	62	8	70	0.14	11.88	2,096	3.36
Florida	1,969	603	2,572	4.95	23.44	10,225	25.16
Georgia	691	211	902	1.74	23.40	13,239	6.81
Hawaii	232	36	267	0.51	13.39	674	39.68
Idaho	1,043	102	1,145	2.20	8.90	10,892	10.51
Illinois	933	83	1,016	1.96	8.18	26,417	3.85
Indiana	741	82	824	1.59	10.00	18,029	4.57
Iowa	1,222	151	1,374	2.64	11.02	43,935	3.13
Kansas	766	92	858	1.65	10.70	23,985	3.58
Kentucky	610	90	701	1.35	12.91	8,006	8.75
Louisiana	343	55	398	0.77	13.71	4,807	8.27
Maine	151	19	170	0.33	11.40	870	19.55
Maryland	291	26	317	0.61	8.09	3,378	9.37
Massachusetts	204	26	230	0.44	11.20	607	37.80
Michigan	1,271	224	1,494	2.88	14.98	12,213	12.24
Minnesota	1,321	153	1,474	2.84	10.35	28,482	5.17
Mississippi	338	48	386	0.74	12.48	8,248	4.68
Missouri	585	80	665	1.28	12.02	14,697	4.53
Montana	359	48	407	0.78	11.88	4,545	8.96
Nebraska	935	101	1,035	1.99	9.71	29,413	3.52
Nevada	136	14	150	0.29	9.53	960	15.67
New Hampshire	62	8	70	0.13	11.61	249	28.11

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Table 4 (cont.)

Farm labor expenses by State, 2022: hired, contract, and total

State	Hired	Contract	Total	State's share of national total	Contract's share of State total	Sales of agricultural products	Labor expenses divided by sales
	Nominal dollars (millions)			Percent		Nominal dollars (millions)	Percent
New Jersey	435	63	498	0.96	12.63	1,488	33.46
New Mexico	336	57	392	0.76	14.48	2,949	13.30
New York	1,227	127	1,354	2.61	9.37	8,037	16.85
North Carolina	933	239	1,172	2.26	20.39	18,693	6.27
North Dakota	496	43	539	1.04	8.02	12,139	4.44
Ohio	845	107	952	1.83	11.26	15,412	6.18
Oklahoma	442	82	524	1.01	15.72	8,541	6.13
Oregon	1,321	323	1,645	3.17	19.66	6,771	24.29
Pennsylvania	1,023	123	1,146	2.21	10.74	10,282	11.15
Rhode Island	27	1	29	0.06	4.82	93	30.80
South Carolina	275	79	353	0.68	22.30	4,427	7.98
South Dakota	589	58	647	1.25	8.92	12,935	5.00
Tennessee	390	78	468	0.90	16.61	5,161	9.07
Texas	1,942	399	2,341	4.51	17.06	32,167	7.28
Utah	287	27	314	0.60	8.59	2,342	13.40
Vermont	144	10	154	0.30	6.50	1,033	14.94
Virginia	503	86	590	1.14	14.66	5,492	10.74
Washington	2,762	453	3,215	6.19	14.09	12,752	25.21
West Virgnia	58	14	73	0.14	19.79	948	7.66
Wisconsin	1,452	89	1,540	2.97	5.75	16,699	9.22
Wyoming	155	20	175	0.34	11.37	1,600	10.95

Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

Since 1997, the rankings of States by total farm labor expenses have gradually changed (table 5). Throughout the 1997–2022 period, California remained the leading State in terms of these expenses, reflecting the size of the State's agricultural production and the labor intensity of its agricultural sector. Two States moved into the top 10 over this period—Minnesota and Iowa—and 2 States moved out—Pennsylvania and North Carolina. Increases in labor expenses over the period in Minnesota and Iowa were mostly driven by oilseed and grain farming (NAICS 1111) and the livestock (especially hogs and poultry) and dairy industries in these States, while notable increases in labor expenses in Minnesota's nursery, greenhouse, and floriculture industry (NAICS 1114) were also observed. North Carolina's decline in position between 2017 and 2022 may be partially attributable to decreased labor expenses in that State's tobacco and poultry industries.

Table 5

Rankings of States by total farm labor expenses, 1997–2022

State	Census year						Change in ranking
	1997	2002	2007	2012	2017	2022	2022 versus 1997
California	1	1	1	1	1	1	0
Washington	4	4	4	3	2	2	2
Florida	2	2	2	4	4	3	-1
Texas	3	3	3	2	3	4	-1
Oregon	6	5	5	5	5	5	1
Wisconsin	7	7	6	6	6	6	1
Michigan	9	8	9	8	8	7	2
Minnesota	12	9	11	11	10	8	4
Iowa	14	12	12	9	9	9	5
New York	10	11	10	10	12	10	0
North Carolina	5	6	7	7	7	11	-6
Pennsylvania	8	10	8	12	11	12	-4

Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

Table 6 presents the two measures of labor intensity by State for 1997–2022, with the States sorted by the labor-to-total-expenses ratio (largest to smallest) for the year 2022. One clear pattern that emerges when comparing tables 5 and 6 is that a State's total farm labor expenses are not necessarily correlated with the labor intensity of its agricultural sector. For instance, in 2022, California ranked first among the States in terms of total farm labor expenses but just eighth in terms of the labor-to-total-expenses ratio and tenth in terms of the labor-to-sales ratio. Thus, the States with similarly labor-intensive agricultural sectors as California include not only States with large agricultural sectors and large farm labor expenses such as Florida, Washington, and Oregon but also States with smaller agricultural sectors such as the New England States of Massachusetts, Rhode Island, Connecticut, and New Hampshire.

Table 6

Ratio of labor expenses to total production expenses and ratio of labor expenses to total sales of agricultural products by State, 1997–2022

State	Labor-to-total-expense ratio						Labor-to-sales ratio					
	1997	2002	2007	2012	2017	2022	1997	2002	2007	2012	2017	2022
	Percent						Percent					
Hawaii	39.0	41.0	39.6	44.2	44.4	43.1	31.3	34.7	37.5	44.1	45.4	39.7
Alaska	24.3	36.7	36.2	36.4	41.7	37.9	21.5	31.1	32.1	34.6	37.8	35.4
Massachusetts	28.2	30.3	28.4	34.4	35.8	35.8	20.0	28.8	26.8	37.6	37.1	37.8
New Jersey	30.2	31.9	31.2	31.6	33.5	35.6	22.8	27.5	26.4	28.7	31.1	33.5
Rhode Island	31.0	30.7	26.6	30.9	32.1	35.4	23.5	26.6	26.2	35.4	32.5	30.8
Connecticut	30.2	33.3	32.0	31.2	31.8	33.4	24.2	28.1	27.2	33.2	30.8	30.8
Florida	31.3	33.4	30.4	28.3	28.2	30.3	23.2	25.3	22.5	23.8	24.9	25.2
California	28.3	29.1	27.0	26.1	28.7	29.6	20.8	23.2	21.5	21.7	24.0	24.8
Washington	22.6	23.5	22.4	23.5	28.5	29.1	17.4	19.6	17.8	20.2	25.0	25.2
New Hampshire	24.1	24.5	19.9	24.7	25.6	26.9	21.0	24.6	19.6	29.9	28.7	28.1
Oregon	23.6	24.5	24.3	22.4	25.3	25.9	17.9	21.4	20.7	20.2	23.5	24.3
Maine	19.5	21.1	20.4	23.3	24.4	25.2	16.1	18.2	16.3	19.7	21.4	19.5
New York	16.5	16.9	17.4	17.0	20.0	21.9	13.7	15.1	13.8	14.2	16.1	16.9
Nevada	18.0	17.5	17.6	14.9	18.1	20.0	14.1	13.2	13.8	12.0	14.6	15.7
Vermont	12.4	15.5	14.1	15.1	17.5	19.4	10.1	14.0	11.5	13.2	14.6	14.9
Arizona	21.0	24.0	16.4	17.1	18.1	17.9	16.4	18.3	14.1	14.9	17.1	14.2
Utah	12.5	13.4	13.2	12.0	14.9	16.0	10.1	11.2	11.3	10.5	12.6	13.4
New Mexico	14.3	14.0	13.1	11.8	13.9	15.4	10.8	12.3	11.5	11.3	12.8	13.3
Michigan	14.1	15.1	13.6	11.8	14.7	15.3	11.4	13.4	11.3	9.4	12.9	12.2
Pennsylvania	13.0	13.2	13.3	12.2	15.1	15.1	10.5	11.2	11.3	10.0	11.6	11.1
Virginia	10.7	12.9	11.9	11.3	14.0	13.5	9.2	11.2	11.1	10.5	12.1	10.7
Idaho	11.3	11.7	11.8	10.0	12.1	12.3	9.2	10.3	9.5	8.5	10.6	10.5
Wisconsin	10.2	11.5	12.1	9.8	11.6	12.1	7.8	9.5	9.1	7.8	9.8	9.2
Maryland	9.4	12.7	10.6	10.1	13.9	12.0	8.1	11.1	8.9	8.6	11.1	9.4
Kentucky	12.4	13.5	9.6	9.5	11.1	11.5	8.5	11.4	7.9	9.0	9.1	8.8
Wyoming	9.6	11.1	11.2	9.7	12.6	11.4	7.4	10.7	9.4	8.9	11.4	11.0
South Carolina	11.9	13.8	9.7	10.3	10.8	11.1	9.6	12.2	8.3	8.7	8.6	8.0
Tennessee	10.9	10.4	10.0	9.7	11.0	10.6	8.6	9.4	10.0	8.5	9.7	9.1
Louisiana	11.7	12.1	10.4	10.3	11.9	10.5	9.0	10.8	8.4	7.6	9.8	8.3

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Table 6 (cont.)

Ratio of labor expenses to total production expenses and ratio of labor expenses to total sales of agricultural products by State, 1997–2022

State	Labor-to-total-expense ratio						Labor-to-sales ratio					
	1997	2002	2007	2012	2017	2022	1997	2002	2007	2012	2017	2022
	Percent						Percent					
Georgia	8.7	10.1	7.1	7.2	9.4	9.8	7.3	7.9	6.0	5.8	7.0	6.8
Montana	8.3	8.6	7.7	7.9	9.0	9.3	6.8	8.5	6.6	6.6	8.5	9.0
Colorado	7.9	9.0	8.0	7.8	9.0	9.3	6.5	8.8	7.2	6.9	8.2	8.2
North Carolina	9.8	10.9	8.9	9.1	12.0	9.1	7.8	8.9	7.2	7.3	8.6	6.3
West Viginia	7.2	9.0	6.9	6.8	8.3	9.0	6.4	7.6	6.4	6.4	7.4	7.7
Ohio	9.3	9.9	8.2	7.5	8.8	8.5	7.3	9.1	6.4	5.8	7.4	6.2
Texas	8.0	8.3	7.2	7.5	8.8	8.4	6.9	8.1	6.6	7.5	8.1	7.3
Minnesota	5.7	6.7	5.5	4.8	6.0	7.1	4.4	5.7	4.3	3.5	5.0	5.2
Oklahoma	5.9	6.8	5.8	5.6	6.2	6.8	5.2	6.2	5.2	5.2	5.5	6.1
Mississippi	6.9	7.3	5.8	6.0	7.6	6.6	5.8	6.5	5.1	4.8	5.4	4.7
Indiana	6.7	7.6	5.6	5.3	6.5	6.6	5.1	6.8	4.3	4.3	5.4	4.6
South Dakota	4.5	4.4	3.9	3.7	4.7	6.4	3.4	3.8	3.0	3.0	4.0	5.0
Missouri	6.6	7.1	5.8	5.6	7.2	6.2	5.2	6.5	4.8	5.0	5.8	4.5
Arkansas	6.1	7.2	5.0	5.1	6.4	6.0	5.1	5.7	4.1	4.0	4.7	4.0
North Dakota	5.5	5.6	4.4	4.3	5.3	5.9	4.7	4.7	3.0	2.9	4.5	4.4
Alabama	5.9	7.8	5.9	5.5	6.6	5.7	5.1	6.2	5.3	4.7	5.1	4.1
Illinois	6.5	7.1	5.6	4.7	5.9	5.7	4.3	5.7	3.8	3.7	4.7	3.8
Delaware	5.1	7.3	4.9	5.8	7.8	5.6	4.6	5.6	3.7	4.4	4.6	3.4
Nebraska	4.3	4.4	3.7	3.3	4.0	4.4	3.3	4.1	2.9	2.7	3.5	3.5
Iowa	4.1	4.3	3.5	3.3	4.2	4.4	2.9	3.6	2.7	2.5	3.4	3.1
Kansas	4.7	4.3	3.7	3.6	4.3	4.0	3.7	4.2	3.2	3.2	3.9	3.6

Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

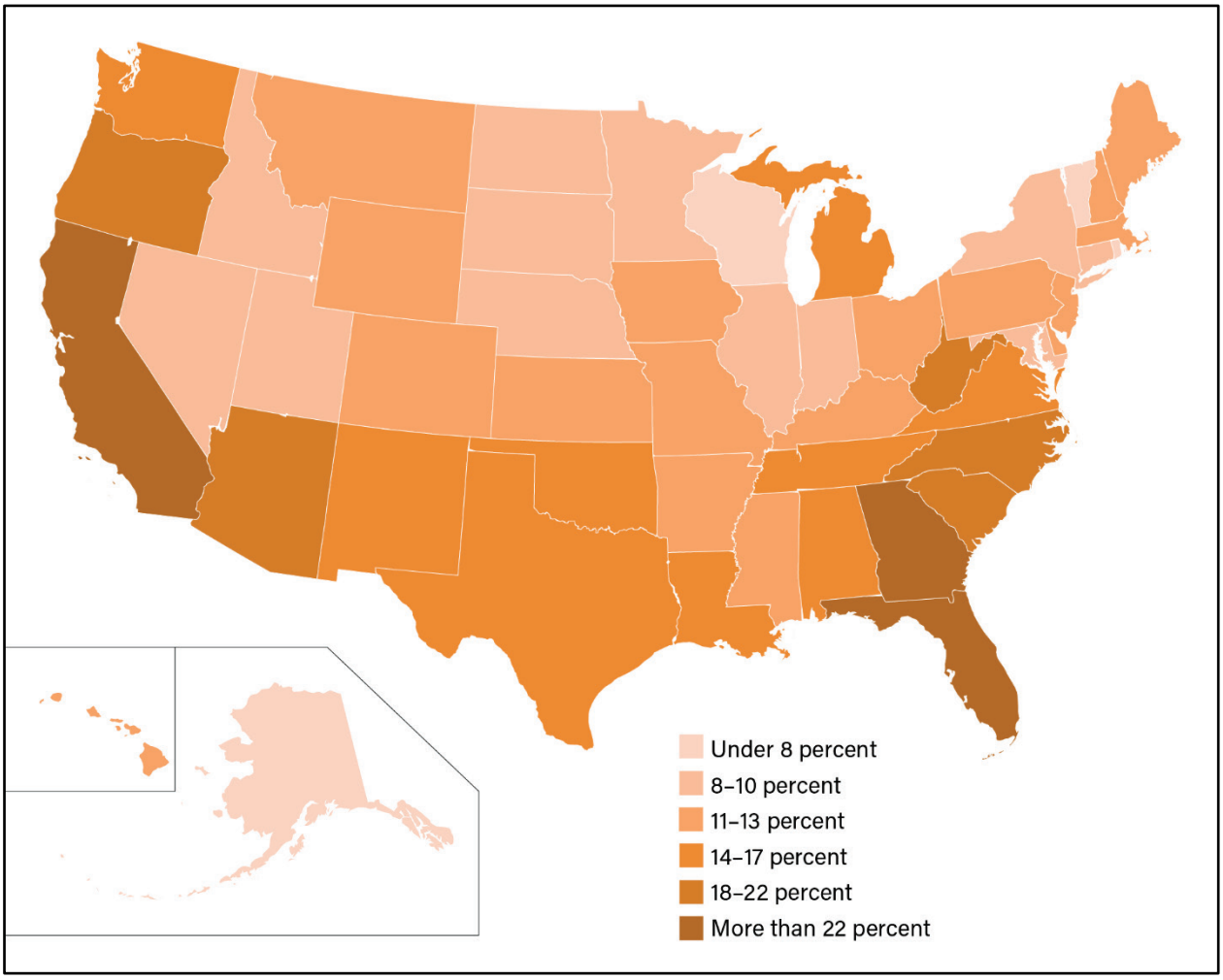
Contract Labor's Share of Total Labor Expenses Increased Between 2017 and 2022

Contract labor expenses as defined by the Census of Agriculture "include payments made to contractors, crew leaders, cooperatives, or any other organization hired to furnish a crew of laborers to do a job that may involve one or more agricultural operations" (appendix B of USDA, NASS, 2024b). In practice, such contract workers may be employed by an agricultural support services firm such as a farm labor contractor (FLC) or may operate independently. In 2022, contract labor accounted for 19.5 percent of total labor expenses in U.S. agriculture. As shown in figure 4, the five States where contract labor's share of total labor expenses was the highest in 2022 were California (34.46 percent), Florida

(23.44 percent), Georgia (23.40 percent), South Carolina (22.30 percent), and North Carolina (20.39 percent) (USDA, NASS, 2024a).[11]

Figure 4

Contract labor's share of total farm labor expenses, 2022



Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

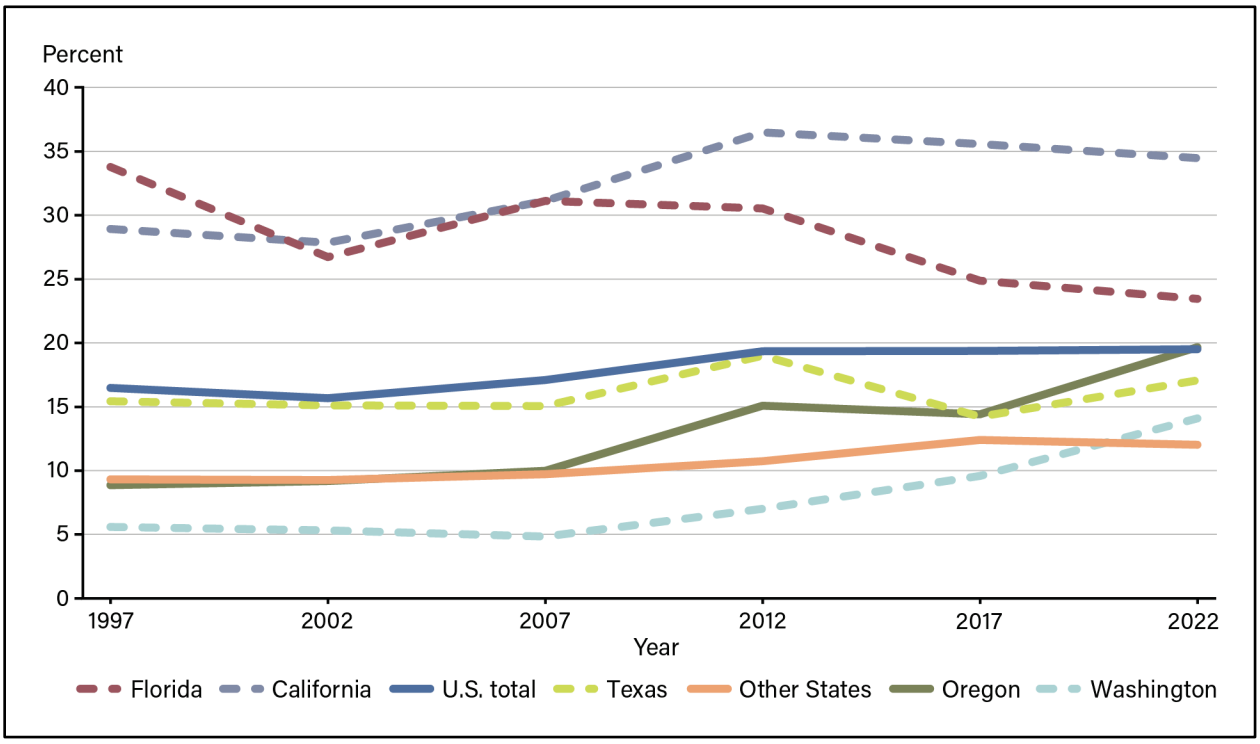
Since 1997, U.S. agriculture has increasingly relied on contract sources of farm labor (figure 5), but contract labor's share of total labor expenses has varied by location and across time. For the sector overall, contract labor's share of total farm labor expenses increased from 16.5 percent to 19.5 percent between 1997 and 2022, with almost all the increase occurring between 2002 and 2012. In California, which led the country in 2022 in both farm labor expenses and contract labor's share of those expenses, contract labor's share followed a trajectory roughly parallel to the national trend, rising from 27.8 percent in 2002 to 36.5 percent in 2012 and then declining slightly to 34.5 percent by 2022. In

[11] The QCEW's values for the total wages of the NAICS code corresponding to FLCs and crews (115115) are much smaller than the Census of Agriculture's values for total expenses on contract labor for the period 2002–2022. For instance, in 2022, the QCEW's value was $6.0 billion, compared with the Census of Agriculture's value of $10.1 billion (nominal values, not inflation-adjusted). By contrast, the sum of the QCEW's total wages for the NAICS codes for support activities for crop production (1151) and support activities for animal production (1152) in 2022 was larger, equaling $14.8 billion.

Oregon and Washington, two States where the use of contract labor was much lower than the national average in 1997 and 2002, contract labor's share increased between 2007 and 2022, with the share for Oregon slightly surpassing the share for the United States and the share for Washington remaining about 6 percentage points below the national share.

Figure 5

Contract labor's share of total farm labor expenses in the United States and in selected States, 1997–2022



Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

A different pattern was observed in Florida, where contract labor's share fell from 31.1 percent in 2007 to 21.7 percent in 2022. One possible explanation of this decline is a shift in the composition of Florida's agricultural production toward the nursery, greenhouse, and floriculture industry, which tends to rely less on contract labor relative to the rest of the State's agricultural sector. In 2022, the nursery, greenhouse, and floriculture industry accounted for 34.0 percent of Florida's sales of agricultural products, compared with 27.4 percent in 2007 (USDA, NASS, 2024a).

Larger Farms Accounted for the Lion's Share of Labor Expenses in 2022

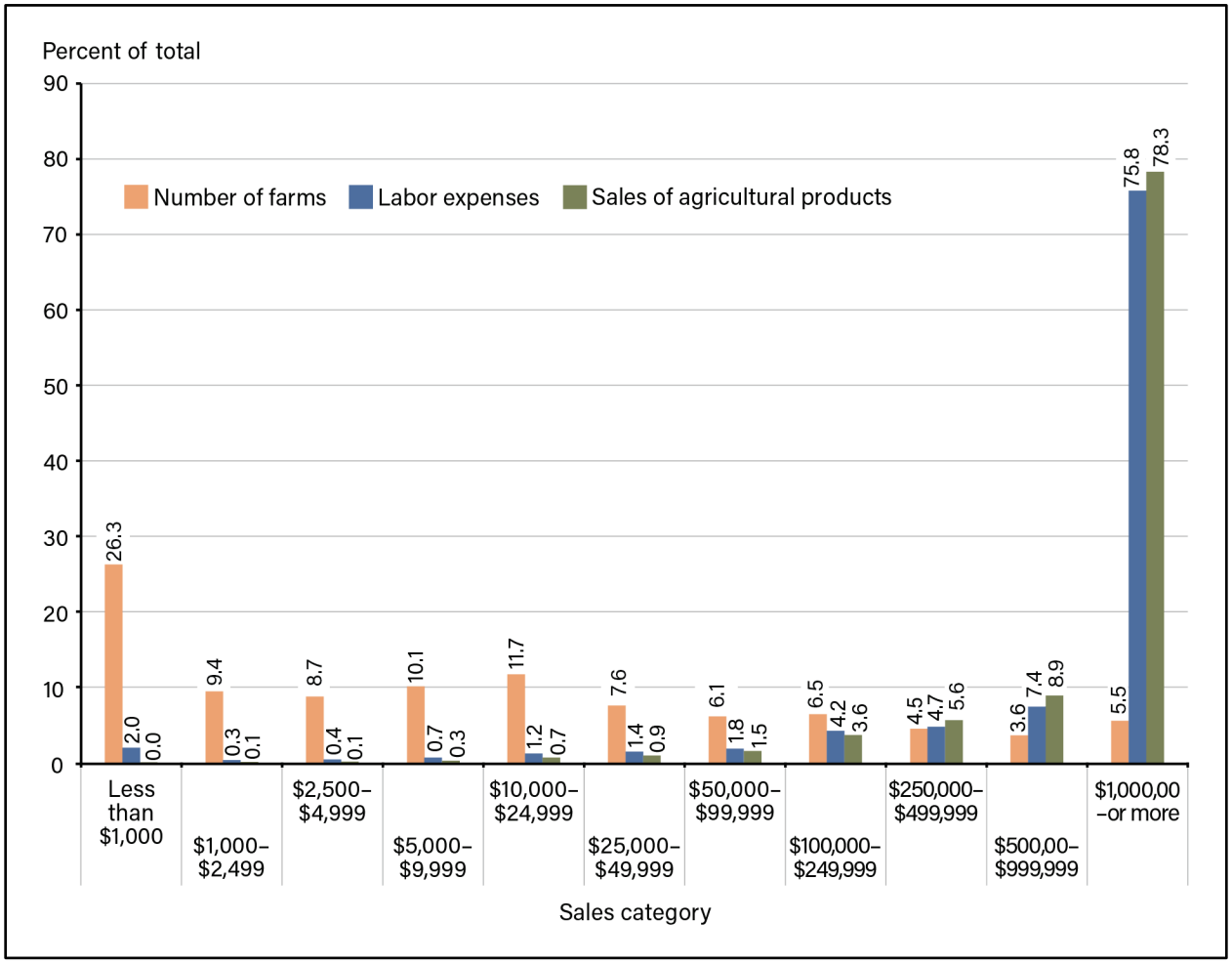
The overwhelming majority of farm labor expenses in the United States are incurred by farms with large sales of agricultural products (figure 6). For Census years 2012, 2017, and 2022, labor expense data are available for 11 farm sales categories, ranging from farms with less than $1,000 in sales of agricultural products to farms with $1 million or more in sales.[12] In 2022, farms with $1 million or more

[12] The category with the highest level of farm sales ($1,000,000 or more) in the QuickStats data for labor expenses is similar to the definition of large and very large family farms (gross cash farm income (GCFI) of $1,000,000 to $4,999,999 and GFCI of $5,000,000 or more, respectively) in the USDA, ERS Farm Typology. In this typology, a family farm is defined as "a

in sales accounted for nearly four-fifths (78.3 percent) of total farm sales and more than three-fourths (75.8 percent) of total labor expenses, even though this category of farms represented just 5.5 percent of the farm operations with sales. Farms with sales in the range of $500,000 to $999,999 accounted for another 8.9 percent of agricultural product sales and 7.4 percent of total labor expenses.

Figure 6

Labor expenses by farm sales category, 2022



Note: Calculations are based on a total of 1,900,487 farms.
Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

With inflation, the real (inflation-adjusted) value of $1,000,000 decreases over time. Thus, if the number of farms is relatively stable, the share of farms with $1,000,000 or more in annual sales of agricultural products is likely to increase with each agricultural census. Data from the past three agricultural censuses show that the percentage of farms with agricultural product sales of $1,000,000 or more held at 3.8 percent in 2012 and 2017 before increasing to 5.5 percent in 2022 (table 7). Meanwhile, the share of farm labor expenses associated with this sales category increased from 67.2 percent in 2012 to 75.8 percent in 2022. This disproportionate increase in the concentration of labor

farm in which the majority of the business is owned by an operator and/or any individual related by blood, marriage, or adoption, including relatives who do not live in the operator's household" (Whitt et al., 2023). The labor expenses data in the QuickStats database, however, do not distinguish between family and nonfamily farms.

expenses in the highest sales category, along with the overall concentration of labor expenses in that category, suggests the potential value of a more disaggregated analysis of the labor expenses of the Nation's larger farms. Because these larger farms accounted for more than three-fourths of U.S. agricultural sales and farm labor expenses in 2022, their labor intensities broadly resembled those of U.S. agriculture overall. For farms with sales of $1,000,000 or more, the labor-to-total-expenses and the labor-to-total-sales ratios in 2022 were 12.9 percent and 9.3 percent respectively (table 7), compared with 12.2 percent and 9.6 percent for all of U.S. agriculture (figure 2).

Table 7

Key labor expense measures for farms with $1,000,000 or more in sales of agricultural products, 2012, 2017, and 2022

Census year	Share corresponding to farms with sales of $1,000,000 or more of:			Ratios corresponding to farms with sales of $1,000,000 or more:	
	Total number of operations with sales	Total labor expenses	Total sales of agricultural products	Labor expenses to total production expenses	Labor expenses to total sales of agricultural products
	Percent			Percent	
2012	3.8	67.2	66.4	10.9	8.6
2017	3.8	70.0	68.7	13.2	10.3
2022	5.5	75.8	78.3	12.9	9.3

Note: Sales categories are not adjusted for inflation.
Source: USDA, Economic Research Service calculations using data from USDA, National Agricultural Statistics Service, Census of Agriculture.

Conclusion

Farm labor expenses in the United States increased with each Census of Agriculture from 1997 to 2022, climbing from $32.6 billion to $53.8 billion in real terms (i.e., inflation-adjusted, expressed in 2023 dollars). Total sales of agricultural products also grew during this period and generally kept pace with labor expenses. In U.S. agriculture overall, the ratio of labor expenses to agricultural sales fluctuated in the range of 8–11 percent over the 1997–2022 period, with the share declining from 1997 to 2012 and then rising from 2012 to 2022. Data for specific agricultural industries indicate that this ratio increased by five or more percentage points between 1997 and 2022 in four industries: aquaculture and other animal production, tobacco farming, sheep and goat farming, and fruit and tree nut farming. In contrast, the ratio for vegetable and melon farming saw only a modest increase, even though the industry is one of the more labor intensive.

Many of the basic contours of farm labor expenses changed relatively little from 1997 to 2022. Labor expenses remained concentrated in California, Washington, Texas, Florida, and Oregon, but there were changes further down the list of States in their rankings by total farm labor expenses. Between 1997 and 2022, Minnesota and Iowa entered the top 10 list, while North Carolina and Pennsylvania exited. The three agricultural industries where the ratio of labor expenses to agricultural sales was the highest were fruit and tree nut farming; nursery, greenhouse, and floriculture production; and aquaculture and other animal production—with fruit and tree nut farming ranked first in 2022 and nursery,

greenhouse, and floriculture production ranked first in 2012 and 2017. Farms with annual agricultural sales of $1,000,000 or more continued to account for the bulk of the agricultural sector's labor expenses. In 2022, this sales group represented just 5.5 percent of the number of U.S. farms but accounted for 78.3 percent of total agricultural sales and 75.8 percent of total farm labor expenses. These statistics suggest the potential value of conducting more disaggregated analysis of the farm labor expenses of larger operations.

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