

# IS THERE A FARM LABOR SHORTAGE?

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The estimated number of unauthorized Mexican immigrants living in the United States decreased by 6.2% in 2011, and has fallen by 12.9% since peaking at 7 million in 2007 (Passel, Cohn, and Gonzalez-Barrera 2012). Because an estimated 46% of the nation's hired crop farm workers are drawn from this population,<sup>1</sup> this recent decrease raises the possibility that farmers might now face labor shortages. Martin (2007) observes that assertions of agricultural labor shortages are most compelling when backed by evidence of rising wages for hired farmworkers. If these wage increases are being driven by labor supply reductions, we should also expect to see falling levels of farm employment. However, Fisher and Knutson (Forthcoming) note that agricultural labor markets are localized, and that specific labor needs vary greatly by crop and type of operation. As a result, some growers may face labor shortages even though others do not.

In this paper we review the available sources of data on farm wages, two of which (the Quarterly Census of Employment and Wages and the Farm Labor Survey) suggest that the average real wage of hired crop farm workers rose by about 3% between 2007 and 2009, but has since returned to its 2007 level. A third source (the Current Population Survey), however, finds that the average real farm wage rose from 2007 to 2010, then leveled off in 2011, with a cumulative increase of 7% since 2007. We then show that the Quarterly Census of Employment and Wages can be used to identify county- and crop-specific changes in earnings per employee that approach the level of specificity desired by Fisher and Knutson.

We find preliminary evidence that is suggestive of labor shortages in support activities such as farm labor contractors and crew leaders and soil preparation, planting and cultivating, and in the production of various fruit and vegetables, particularly in counties in California, Michigan, and several other states.

## Data

The four national sources of farmworker wage data are described below; additional details about these datasets appear in the appendix.<sup>2</sup>

### *The Farm Labor Survey (FLS)*

The FLS is a semi-annual telephone survey of a representative sample of about 12,000 farms that collects information on employment, wages, and hours for nonsupervisory field and livestock workers, as well as for supervisors and all other types of farm employees, such as bookkeepers and pilots (USDA-NASS 2009). Regional average hourly wages for nonsupervisory field and livestock workers from the FLS define the "adverse effect wage rate" (AEWR), which is used in the determination of the legal minimum wage for foreign-born, temporary nonimmigrant farmworkers recruited under the H-2A Temporary Agricultural Program.

The FLS's strength is its ability to estimate both wage and employment levels at quarterly intervals for directly hired farm workers, based on a representative national sample of farms, in a reasonably consistent fashion over many years.<sup>3</sup> The FLS's main limitations are the lack

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<sup>1</sup> This figure was calculated from the 2007-09 waves of the National Agricultural Workers Survey (USDOL-ETA 2011b).

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<sup>2</sup> We do not discuss the Census of Agriculture, which records total payroll and employment but does not track hours or weeks worked, and so cannot be used to study weekly earnings or hourly wages. We also do not examine the Agricultural Resource Management Survey (ARMS), which has only collected hired labor employment data since 2009. A third source, the American Community Survey, is excluded due to the difficulty of estimating wage rates for workers who hold multiple jobs over the course of a year, particularly those who mix farm and nonfarm work.

<sup>3</sup> The USDA has collected information on farm wages since at least 1930. The earliest reports featured quantitative indices of

of information on worker demographics and farm characteristics (in particular, crop), and the inability to disaggregate below the regional (multi-state) level for states other than California and Florida. Lack of a publicly accessible version of the complete dataset is another limitation. Reports from the FLS, however, are archived (USDA-NASS 2012a), and some of its data are available online in the *Quick Stats* database (USDA-NASS 2012b).

#### *The National Agricultural Workers Survey (NAWS)*

The NAWS is an employment-based, face-to-face survey of crop farmworkers (but not livestock workers) that has interviewed more than 53,000 people since its inception in 1988 (USDOL-ETA 2011b). As such, it is the most detailed source of information on demographics, migration patterns, employment, wages, health, and living conditions of hired crop workers, and it is the only national survey that tracks legal immigration status. The principal advantage of the NAWS is the detailed nature of the questionnaire, while its main disadvantage is its small annual sample size (between 1,500 and 3,600 workers), which prohibits geographic disaggregation beyond the multi-state region (except California).

#### *The Current Population Survey (CPS)*

The CPS is a monthly survey of about 60,000 households, which focuses on employment-related topics (USDOL-BLS 2012a). Hired farmworkers may be identified by their occupation and industry. The CPS's publicly accessible datasets contain a wealth of economic detail on workers, but the number of farm employees captured is too small to permit much geographic precision: wages are available for roughly 700 nonsupervisory crop and livestock workers per year. For the analysis of wages, we use a version of the data from the *Center for Economic and Policy Research* (2012), which deals with problems of topcoding, and standardizes variables across years.

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labor supply and labor demand from which determinations of labor shortages could be made. In 1934, these indices were discontinued. The FLS was conducted quarterly until 2012 but is now semi-annual. Respondents now are asked to reconstruct wage and employment levels for the previous two quarters. As of 2012, the survey no longer counts contracted agricultural service workers.

#### *The Quarterly Census of Employment and Wages (QCEW)*

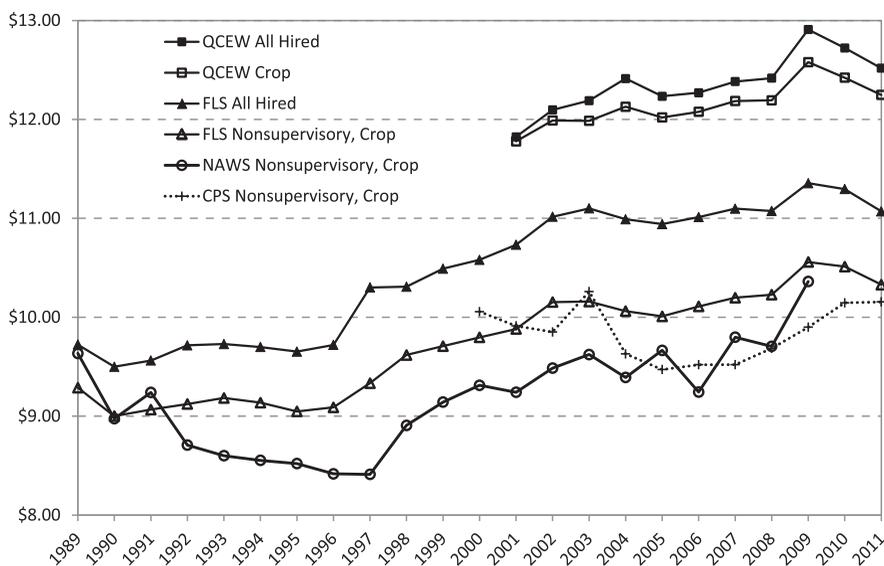
The QCEW collects employment and payroll data from all employers covered by state unemployment insurance programs (USDOL-BLS 2012b). In 2010, about 85% of all hired farmworkers were covered by the QCEW (USDOL, BLS 2011), with nearly complete coverage in Arizona, California, Connecticut, Delaware, Florida, Hawaii, Massachusetts, New Jersey, Rhode Island, and Washington (USDOC-BEA 2012, p. II-4). In states where coverage is incomplete, it is the smaller farm employers (those with quarterly payrolls of less than \$20,000 that do not regularly employ 10 or more workers) that are excluded (USDOL-ETA 2011a). Coverage for farm labor contractors (North American Industry Classification System [NAICS] Code 115, Agriculture and Forestry Support Activities year) is complete only in Arizona and California.

The QCEW measures average weekly (not hourly) earnings per employee by detailed industry, but no demographic or occupational information is available. At the national or state level, the QCEW's public use data can be disaggregated to specific crops, for example: strawberry farming (NAICS code 111333) or mushroom production (111411). At the county-level, nondisclosure requirements lead to the suppression of wage data for one-quarter to one-third of covered farmworkers, depending on the level of crop detail. However, almost all of the missing data can be restored given access to confidential, unsuppressed QCEW data, subject only to several state-specific exclusions.<sup>4</sup>

Unauthorized workers may be underrepresented in all of these datasets. Surveys of employers, such as the QCEW and the FLS, are thought to be more likely to pick up unauthorized employment than surveys such as the CPS and NAWS that query individuals, some of whom may be wary of speaking to government enumerators (Levine 2009). The NAWS requires the permission of employers to contact workers, and it is possible that employers with large unauthorized workforces are less inclined to participate. The CPS may also miss farmworkers living in labor camps or other non-standard forms of housing.

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<sup>4</sup> Connecticut, Massachusetts, Michigan, New Hampshire, New York, and Wyoming do not permit the BLS to disseminate the unsuppressed QCEW data, even to researchers who sign affidavits of nondisclosure. This excludes just 2% of covered employment in agriculture and related support activities.



**Figure 1. Real hourly wages of farmworkers in QCEW, FLS, NAWS, and CPS**

Source: Authors' analysis.

Note: Adjusted to 2011 prices using the Consumer Price Index (CPI-U).

### Trends in Hourly Wages

Figure 1 plots average real hourly wages (at 2011 consumer prices) for various categories of farm employees using data from the QCEW, FLS, NAWS, and CPS.<sup>5</sup> The QCEW-based estimates for 2011 were \$12.52 for all hired farmworkers, and \$12.25 for crop workers. In contrast, the FLS estimates were \$11.07 for all hired workers and \$10.33 for nonsupervisory crop workers. The gap between the QCEW's and the FLS's results may be due to: the inability to select particular occupations within farming industries in the QCEW; the QCEW's bias towards larger operations in some states, and; differences between BLS and USDA definitions of what constitutes a farm. Still, while these results differ with respect to levels, they display similar trends: real wages peaked in 2009 and have fallen by 1% to 2% per year since then.

The employee-reported results from the CPS and NAWS generally lie below the employer-based figures. This may occur because some FLS respondents report their total payroll costs rather than cash compensation paid to the employee, while workers may report after-tax incomes even when asked to report on a pre-tax basis, or it may reflect differences in the types of workers captured by very different survey designs. The NAWS displays a trend that is similar to that of the FLS and the QCEW through 2009, with a pronounced spike in that year; results from the 2010 and 2011 NAWS are due to be released in the fall of 2012. The behavior of the CPS-based estimates is puzzling: they track the FLS fairly closely from 2000 to 2003, then fall sharply, and more or less track the NAWS data from 2004 to 2009. The CPS provides the only evidence that real crop farm worker wages were higher in 2011 than in 2007, although wage growth appears to have slowed to zero in 2011.

### Counties with Rising Wages and Falling Agricultural Employment

We can use the QCEW to calculate the percentage change in average weekly earnings per employee (not adjusted for inflation) between 2010 and 2011 for all crop and livestock operations, and for related support

<sup>5</sup> The QCEW hourly wage estimates were calculated by dividing weekly earnings from the QCEW by estimated hours per week from the FLS. QCEW results for all hired farmworkers are based on NAICS codes 111 (crop production), 112 (animal production), 1151 (support activities for crop production), and 1152 (support activities for animal production). Estimates from the NAWS and CPS are weighted by hours worked, to be consistent with the way FLS average wages are calculated. NAWS estimates are adjusted for seasonal month-of-interview effects.

**Table 1. Selected Counties with Rising Wages and Falling Employment in Agriculture between 2010 and 2011, Using 3-Digit NAICS Industry Codes**

County	Industry	Job Growth	Wage Growth
Bradley, AR	Services	-25%	63%
Miami-Dade, FL	Services	-7%	55%
Montgomery, GA	Crops	-33%	46%
Boone, IA	Crops	-15%	77%
Penobscot, ME	Crops	-28%	50%
Lapeer, MI	Livestock	-36%	60%
Missaukee, MI	Crops	-8%	48%
St. Joseph, MI	Services	-36%	85%
Williamsburg, SC	Services	-20%	42%
Williamson, TN	Livestock	-9%	51%
Zavala, TX	Services	-2%	46%

Source: Authors' analysis of QCEW data.

Notes: Coverage limited to publicly disclosed county/industry cells in crops (NAICS code 111), livestock (112), and support services (115). Counties shown had industry-specific increases in average weekly earnings of 40% or more, at least 40 agricultural employees in 2010, and declines in farm employment not exceeding 50% between 2010 and 2011.

services, by county, for the 85% of hired farmworkers who were covered by state unemployment insurance. At this level of disaggregation, 13.5% of establishments and 8.5% of covered farmworkers are dropped due to suppression. Table 1 lists the counties that meet the following criteria, which are suggestive of labor shortages: average weekly earnings per worker rose by 40% or more between 2010 and 2011, and employment fell, but not by more than 50%. This last requirement is an attempt to exclude counties where the observed wage increase might be due to a major change in the occupational composition of employment, as may occur when a large establishment ceases operations in the county. We also require that at least 40 people were employed in the county in crops, livestock, or support services in 2010.

Counties that meet these criteria are found in nearly all regions of the country and display increases in earnings of up to 85%. Michigan is the only state to appear in the table more than once, with rapidly rising earnings in three separate farm sectors in three separate counties. Although these data are aggregated across crops and thus cannot tell us how wages are evolving for particular crops in a particular county, it is nonetheless possible to identify the crops that are grown in each county (results not reported).

### Evidence of Crop-specific Labor Shortages

Table 2 repeats this analysis at the 6-digit NAICS level, allowing for considerable specificity in terms of affected crops or activities.

At this level of disaggregation, however, we lose 47% of the establishments, which collectively employ 36% of covered farmworkers, due to data suppression. The analysis below is thus preliminary and is intended to indicate what would be possible given access to the confidential dataset, in which suppression conceals just 2% of covered workers.

Several support activities, namely, farm labor contractors and soil preparation services, appear on the list in multiple states. California has seen rapidly rising earnings per worker and falling employment in these two activities, as well as in the production specialties of fruit and tree nuts, other noncitrus fruits, and other miscellaneous crops. Michigan is again well represented, with possible labor shortages in apples, nurseries, other vegetables and melons, and soil preparation services. Some of the less labor-intensive field crops such as potatoes, wheat, rice and corn are also on the list in particular places.

### Conclusions

Of the datasets examined, only the CPS indicates that wages were higher in real terms in 2011 than in 2007. Two sources—the FLS and QCEW—suggest that the real wages of crop farmworkers peaked in 2009 and have since fallen back to 2007 levels.

We outlined a procedure that relies on the QCEW's public use data to help identify areas with possible farm labor shortages. This procedure is subject to an important caveat: because the QCEW's payroll and employment tallies contain no occupational information, we

**Table 2. Selected Counties with Rising Wages and Falling Employment in Agriculture between 2010 and 2011, Using 6-Digit NAICS Industry Codes**

County	Crop / Activity	Wage Growth
Kern, CA	All other miscellaneous crop farming	44%
Muskegon, MI	Apple orchards	48%
Gibson, IN	Corn farming	42%
Glenn, CA	Farm labor contractors and crew leaders	47%
Okeechobee, FL	Farm labor contractors and crew leaders	52%
Kings, CA	Fruit and tree nut combination farming	66%
Missaukee, MI	Nursery and tree production	48%
Sacramento, CA	Other noncitrus fruit farming	57%
Oceana, MI	Other vegetable and melon farming	44%
Bonneville, ID	Potato farming	45%
Lonoke, AR	Rice farming	44%
Riverside, CA	Soil preparation, planting, and cultivating	53%
St. Joseph, MI	Soil preparation, planting, and cultivating	47%
Becker, MN	Turkey production	43%
Jackson, OK	Wheat farming	84%

Source: Authors' analysis of QCEW data.

Notes: Coverage limited to publicly disclosed county/crop cells at the NAICS 6-digit level. Other criteria are the same as in table 1.

cannot be sure that observed wage increases are driven by rising wages for particular types of workers rather than by changes in the occupational composition of a given county's workforce. Moreover, high levels of suppression in the QCEW's county-level datasets at the NAICS 6-digit level limit our ability to measure changes in wages for particular crops in each county. Access to the confidential version of these datasets would eliminate all but about 2% of the suppression problem.

Working with that portion of the QCEW's data that is not suppressed, we identified counties and crops in which agricultural employment fell, while farm wages rose by 40% or more. We find preliminary evidence of the localized labor shortages described by Fisher and Knutson in certain counties in California, Michigan, and other states among farm labor contractors and crew leaders, in soil preparation, planting and cultivating, and in fruit and vegetable production.

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## Appendix: Sources of Information on Wages of Hired Farmworkers

### *Farm Labor Survey (FLS)*

Sponsors: USDA-NASS, and USDOL-ETA. Frequency: Quarterly, 1930 to 2011; now semi-annual. Sample size: Representative sample, 12,000 farms. Identifiable Occupations: All directly hired, all nonsupervisory, crop versus livestock. Data: Total wages paid and hours worked during reference week in last quarter; hourly wage. Covariates: 17 regions, 6 size classes, 3 products. Access: Reports are archived and summary data are online, but farm-level records are not accessible.

### *Quarterly Census of Employment and Wages (QCEW)*

Sponsor: USDOL-BLS. Frequency: Quarterly, 1990 to present. Sample size: All employers covered by unemployment insurance. Identifiable Occupations: Covers all hired workers in specified industries, no occupational detail. Data: Average number of full-time and part-time workers over past quarter; payroll; weekly earnings. Covariates: State, county, number of employers, 6-digit NAICS codes. Access: Summary data at different industrial/geographic levels are online, with significant suppression. Access to unsuppressed county-level data is possible for agencies that negotiate a memorandum of understanding with BLS.

### *National Agricultural Workers Survey (NAWS)*

Sponsor: USDOL-ETA. Frequency: 3 survey waves per year, 1988 to present. Sample size: Weighted sample of field crop farmworkers; 2,200 in 2009. Identifiable Occupations: Field workers, supervisors, contract service workers. Data: Wages received and hours worked in last pay period; hourly wage, including piece work payments expressed as hourly wages. Covariates: Six regions, detailed worker demographics, crop and task details. Access: Person-level records (with no identifying information) are publicly available in electronic form, with a significant time lag; additional variables accessible to authorized researchers.

### *Current Population Survey (CPS)*

Sponsors: USDOC-Census Bureau, and USDOL-BLS. Frequency: Monthly, 1968 to present. Sample size: Complex weighted sample, roughly 60,000 households. Identifiable Agricultural Occupations: Farm laborers, supervisors, managers. Data: Wages received and hours worked last month; hourly wage. Covariates: Many household level economic details; state of residence, but insufficient observations for state-level analysis of farm wages trends. Access: Person-level records (with no identifying information) are publicly available in electronic form.