

## New Method for Surveying Farm Worker Populations

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Household surveys or other population cross-sectional surveys of farm workers populations exhibit large variances in reported data. Seasonality of employment, migratory work patterns, homeless workers and the difficulty of accessing undocumented workers are among many factors confounding survey results. Martin has described these and other variances in his book Harvest of Confusion (Martin, 1990). The limitations of household surveys of farm workers has led government demographers to discontinue the Hired Farm Work Force survey, which had been based on the Current Survey of Population (United States Department of Agriculture).

The National Agricultural Workers Survey (NAWS), essentially a job site survey as distinct from a household survey, has avoided many of these problems. However, farm workers who are in the labor force but are not employed at the times the survey is conducted (January, May and September) are excluded from the sample frame causing some to question the validity of NAWS results. In addition, the NAWS does not consciously seek to conduct a survey at the peak of seasonal employment raising additional questions about conclusions based on NAWS. The limitations of the NAWS have been discussed elsewhere (Holt, 1994).

In California, where administrative records are more comprehensive than in other states, the variance in the reported number of agricultural employees is unacceptably large. The 1990 Census of Population (April) reports approximately 175,000 California agricultural workers whereas, during the same time frame (pay period including April 12, 1990), farm employers reported paying employment taxes for 349,448 employees. Peak farm employment in 1990 was 475,933 (pay period including September 12, 1990). Separate enumeration of distinct employee Social Security numbers reported by agricultural employers in 1989 totalled more than 850,000. Kissam, Gabbard and Martin have recently described the Census under-count in some detail (Kissam, et al, 1993).

These data suggest that the California hired farm work force is very likely between 500,000 and 850,000. The number of California farmers is just 42,000 (U.S. Department of Commerce, 1989). California farmers and unpaid family members reportedly supply just 20% of the state's farm labor, down from 40% in 1950 (California Department of employment Development, 1993). Hired workers today furnish 80% of all of the labor supplied on the state's farms, a higher fraction than at any time in this century (California Department of Employment Development, 1993).

We have conducted two surveys of farm workers utilizing a new methodology that attempts to systematically take account of two of the most important sources of variance in household surveys of farm workers: (a) seasonality of farm employment and (b) many workers reside in unconventional quarters. This approach is based on the frank recognition that a large fraction of the farm labor force is nomadic and, as well, may live in temporary, unconventional quarters while seasonally employed.

## Sampling Methodology

The method employs systematic identification of all sites where individuals are found to be living, especially unconventional sleeping places such as garages, encampments and other temporary quarters. These newly identified sites are then incorporated into the sample frame along with houses, apartments and mobile homes which normally comprise the sample frame of household surveys such as the Census. Thus, a universal sample frame of living sites is developed enabling investigators to use statistically rigorous techniques for sampling.

This method elaborates on a demographic technique to sample nomadic populations first utilized by the Colorado Migrant Council (Stout, 1985). However, we have developed the method in a manner that makes it statistically reliable, as further described in detail below.

This sampling technique was utilized in a cross-sectional population survey of farm worker health status conducted during summer 1992 in collaboration with Schenker, McCurdy, Gold, Mobay, Samuels, Saiki, et al. One hundred and fifty subjects completed both an interview and limited physical examinations (blood, urine, saliva, respiratory function). The study design recognized that this was a pilot project, with possible elaboration to other areas of the state.

The geographic locale selected for this pilot survey was the area defined by the zip code boundary of Parlier, California, a small city located southeast of Fresno. The area comprises approximately thirty-six square miles, of which roughly two square miles are residentially developed; the balance is farm land, with dispersed housing units.

The entire zip code area was sub-divided according to Census blocks (twenty-four) and a random sample of Census blocks was drawn. In each selected Census block a detailed mapping of identifiable sleeping sites was undertaken, with special attention direct to finding locations which are not usual places of residence. Each distinct identifiable site is termed a "Sampling Unit" (SU).

Subjects were then randomly selected using the following protocol: a sample of SUs was drawn; a trained interviewer visited the SU site and enumerated all persons who reportedly slept at that site at that time, whether present during this initial visit or not; separate lists of men and women known to sleep at the SU were constructed, ranked by age; tables of random numbers were then used to separately select men and women over age 17; interviews were conducted only with the selected subjects, even if repeated return visits were required to establish contact; subjects were then asked to voluntarily complete a physical examination and were awarded a \$20 stipend at its conclusion.

## Seasonality of Employment

Most farm tasks are short-term, seasonal jobs. Correspondingly, most farm workers are hired on a short-term basis. Detailed knowledge of the local seasonality of labor demand can serve to inform the timing of a household survey, especially in settings where nomadic employees are likely

to be present only in periods of peak labor demand.

In the present case we identified a direct measure of monthly labor demand for agricultural tasks for each crop produced by Parlier area farm operators. For practical purposes we define a "Parlier farm operator" to be a business with at least one crop field located within the geographical area of the Parlier zip code.

The California Institute for Rural Studies maintains a large data base identifying, by precise location of individual crop fields, the farming activities of nearly all commercial crop farms in the entire San Joaquin Valley, and for much of the remainder of the state as well. Our computer programmer, Gretchen Bradfield, developed a program enabling the identification of all farms with at least one crop field within a specified geographic area. The program also provides detailed, crop-by-crop summaries of the acreage for these farms. A summary of this type is shown for Parlier farm operators in Figure X.

The detailed crop summary is then used to provide a month-by-month labor demand profile for each crop, and, subsequently, a total labor demand estimate for all crops. The labor demand coefficients for many California crops, including month-by-month figures, have been published (Mamer, et al, 1991). The resulting monthly labor demand profile for the Parlier zip code area is shown in Figure X.

One of the obvious features of the Parlier monthly labor demand profile is that there are several "peaks" in the pattern of labor demand. The largest peak occurs in August, but there are other peaks as well. It is of more than passing interest that the labor demand is very nearly zero in March and begins to rise again in April. Clearly, the Census of Population data for a community like Parlier might very well be adversely impacted by this reality.

Population demographics of the sample are discussed in the context of other household surveys of farm workers.

## Survey Results - Demographics

Age	36 years
Duration in U.S.	11 years
Education level	7th grade
Year work in ag	12 years
Months away	3.3 months
Months of ag work	6.6 months
Ethnicity	
Texan	3%
Mexican-American	17%
Mexican	71%
White	2%
Mixtec	1%
Other	6%
Gender	
Male	48%
Female	52%
Country of origin	
U.S.	36%
Mexico	64%
Ever done farm work	
Yes	95%
No	5%
Times move per year	
0	77%
1-2 times	23%
more	1%
Farm work last year	
Yes	66%
No	33%
Migrant farm worker	
Yes	40%
No	59%
Sanitary facilities provided in fields	
Yes	76%
No	21%
N.A.	2%
Exposed to pesticides last week	
Yes	17%
No	81%
N.A.	2%
Ever load/mix pesticides in fields	
Yes	15%
No	85%
Work safety instruction at job	
Yes	49%
No	40%
N.A.	11%
Health insurance	
Yes	40%
No	61%