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CALIFORNIA'S FARM LABOR MARKET

Philip L. Martin

UC AIC Issues Paper No. 87-1, July 1987

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Abstract

This report examines California's farm labor market. It reviews the characteristics of farm employers, analyzes trends in farmworker employment, summarizes what is known about who does farmwork, and examines the operation of the farm labor market. After this substantial amount of background, several farm labor issues are reviewed: unions, migrancy, farmworker housing, and immigration reform.

California's farm labor market is marked by an apparent overall stability in the number of farm employers and jobs for hired workers. Since 1960, from 35,000 to 40,000 farms have hired an average 190,000 to 220,000 workers. However, this apparent stability masks important changes in the farm labor market:

- Farm employment and wages remain concentrated on the 6,000 largest farms, but in recent years more wages have been paid through intermediaries such as labor contractors.
- Farmworker employment numbers have remained stable because labor-intensive agriculture expanded and created new jobs as fast as mechanization eliminated jobs.
- Farmworkers today are mostly immigrants born in Mexico who first come to the United States between the ages 18 and 30. About 40 percent are migrants: Some migrants cross the U.S. border seasonally; some follow-the-crops within California; and some do both.

- Most farmworker recruitment is through friendship and kinship networks, meaning that a foreman or labor contractor obtains additional workers by recruiting one or two key workers, and then gaining access to their friends and relatives.
- Wages for California fieldworkers average over $5 hourly or $175 weekly, but there is considerable variation around these averages. These hourly and weekly wages are above minimum wage levels, but most farmworkers earn only $3,000 to $6,000 annually because of frequent spells of unemployment.
- Collective bargaining has had limited impacts on the farm labor market. Union activity under the 1975 Agricultural Labor Relations Act resulted in sharp wage increases between 1979 and 1981, but sustained union impacts on wages, fringe benefits, and working conditions have not been felt statewide.
- The Immigration Reform and Control Act of 1986 imposes sanctions or fines on employers who knowingly hire illegal alien workers, offers a special amnesty for farmworkers, and establishes programs to admit legal alien farmworkers. Immigration reform and demographic trends promise to increase labor costs in agriculture, although the amount of the increase will depend on how large the temporary worker programs become.

Acknowledgments

This report summarizes five years of research and writing on California's farm labor market. Preparation of this report was supported by the University of California Agricultural Issues Center. The report is based on research supported by the Rosenberg Foundation. Other sources of support for this research include the German Marshall Fund of the United States, the University of California Giannini Foundation of Agricultural Economics, and the Farm Foundation. An earlier draft of this report has been circulated within the California Employment Development Department.

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Introduction

California agriculture is unique in its structure and ownership patterns, production methods, transportation and marketing arrangements--and it is more dependent on hired labor than agriculture elsewhere in the United States. Special structural characteristics of California agriculture include the concentration of production on a few large farms and crop specialization on single farms but statewide diversity in the commodities produced. However, the largest single producer of some specialty crops, e.g., lettuce, accounts for a high percentage, say, from 10 to 20 percent, of the state's total production. This concentration and specialization is obscured by the overall picture of an extremely diverse agriculture where 82,000 farms produce over 250 commodities.

The uniqueness of California agriculture's structure, production methods, and marketing arrangements can be highlighted with a few contrasts. California's farm production is concentrated on a few large farms: In 1982, the largest 5 percent of U.S. farms sold 54 percent of U.S. farm output, but in California the largest 6 percent sold 73 percent. California farmers depend more on irrigation, double cropping, specialized equipment including computers, and chemical inputs than do farmers elsewhere, and there are more college-trained farm operators and specialists providing assistance to farmers. In midwestern states, farm policy decisions which affect the prices of milk, wheat, or corn are of major concern; in California, government decisions on trucking deregulation or immigration reform are of vital importance.

This report focuses on the labor market of California's labor-intensive specialty commodities such as grapes, nursery products, lettuce, flowers,

citrus, and strawberries. These commodities account for less than one-third of the value of the state's output, but they are most dependent on large numbers of hired workers.

Specialty crop production is responsible for the hallmarks of California's labor market: seasonality, an immigrant workforce, and intermediaries such as farm labor contractors. These three hallmarks are responsible for a century of farm labor debates.

Seasonality means that farmworker employment fluctuates from month to month, so that farmworkers must move from farm to farm to increase the number of weeks of farm employment. A seasonal farmworker is defined as one who does farmwork for wages less than six months on one farm, so a seasonal worker may work five months on each of two farms and still be considered seasonal. Although seasonality has declined considerably because of mechanization that reduced labor peaks, and new seeds and production methods that have stretched out peak activity periods, there are still about 450,000 seasonal farmworkers in California.

Most of California's farmworkers are immigrants. Most migrate to the state for the first time between the ages of 18 and 30. Since World War II, most have been born in Mexico, but immigrant workers also come from Central America, Asia, and the Middle East. The most arduous harvesting tasks are done by recent immigrants; as workers get older and more experienced in the U.S. labor market, they shift to less physically demanding farm jobs, find a nonfarm job, or return to their home countries. The relatively short harvest careers of most farmworkers mean that the farm labor market requires an annual infusion of new workers. If 10 percent of the 450,000 seasonal workers exit each year, then 45,000 new workers are required annually.

Intermediaries are the first line supervisors and labor contractors who match workers and jobs. Most farms rely on foremen, but farm labor contractors, employer-run labor cooperatives, union hiring halls, and the U.S. Employment Service are also used to match workers and jobs. Today, one might expect that computer technology could replace intermediaries and minimize farmworker unemployment. Instead, intermediaries are becoming more important: Labor contractors and the foremen of ranches and packinghouses are recruiters of new workers, a task they usually perform without direct involvement of top management. Thus, even though labor costs are 30 to 50 percent of total costs on many specialty crop farms, employment responsibilities are usually pushed far down the chain of command.

California's farm labor market has changed during the past two decades. Average hourly wages are considerably higher than the minimum wage, and fringe benefits have expanded to include mandatory social security and unemployment insurance, frequently the provision of off-the-job health insurance, vacation pay, and pensions. More farmworkers are employed on a regular basis, i.e., more than six months on one farm. These longer periods of employment have encouraged workers to settle in an area with their families, helping to decrease migrancy and enabling many farmworker children to look toward nonfarmwork careers. Even seasonal workers are settling down, and more of them live off the farm and collect unemployment insurance (UI) payments when jobs are unavailable.

The variance in farm labor wages across California has also increased over time. In 1963, the average hourly wage in California agriculture was $1.28, with most farmworkers being paid between $1.15 and $1.40 per hour. Today, the average hourly wage is $5, but the range is greater: $8 to $11 on

large vegetable farms, $6 to $8 in mushrooms, citrus, and some specialty crops, and $3.35 to $4 in thinning and weeding and many harvesting jobs. The inclusion of fringe benefits makes the variance in wages even greater because higher wages and more fringe benefits usually go together.

There are other changes during the two decades whose effects are harder to sort out. Collective bargaining has had limited impacts on the state's labor markets. Government regulation of farmworker housing, wages, and working conditions has increased, but enforcement is uneven. Social service program have assisted individual farmworkers and their families find nonfarm jobs, and farmworker settlement and more widespread secondary school education have enabled most U.S. educated farmworker children to pursue nonfarmworker careers.

Many farm labor features have not changed. The seasonal work force remains predominantly Mexican-born or Mexican-American, although most farmworkers in the 1960s were braceros or U.S. citizens; today they tend to be illegal-undocumented workers or greencard immigrants. Sharp seasonal employment peaks and troughs still prevail in most labor-intensive crop harvests, and intermediaries still do most of the seasonal job matching.

The farm labor market will be different in 2000; some of these changes can be anticipated. California's specialty crops will probably face increased competition from other states and countries which reduce real farm prices and encourage employers to resist cost-increasing labor changes. Trends in technology and trade might further modify the structure of production and ownership, with important indirect effects on the labor market. High capital costs may further increase the minimum efficient size of farming operation,

and high land prices may lead to more separation of land ownership and farming, meaning that professional managers will operate more California farmland. Farms committed by specialized equipment to a particular commodity and owned by "outsiders" may be more vulnerable to consumer boycott pressures.

Government policy will influence the evolution of the farm labor market: Decision on employer and worker rights will influence the scope and impacts of collective bargaining; immigration policy decisions could change the number, characteristics, and wages of farmworkers; regulatory decisions will help to determine minimum wages and working conditions; and farmworker service program will alter the cost and availability of housing and the options of farmworker children. The most important unknown is whether economic factors, technological trends, and government policies during the next 15 years will integrate the farm and nonfarm labor markets--or whether they will tend to segregate the markets. Some areas are effectively integrated into nonfarm labor markets. For example, the coastal vegetable and specialty crop farms have waiting lists of workers who have alternative nonfarm employment. These farm employers compete with other employers for reliable employees, by offering an hourly wage of $6 to $9.

However, most California farm employers do not compete with nonfarm employers for workers. Farm labor markets may provide the only available jobs to immigrant workers who are excluded from other jobs by lack of education, skills, or language. A farm labor market dependent on such workers becomes isolated and defensive, with employers arguing that "American workers won't do farm work." An isolated farm labor market becomes dependent on government immigration policies for workers, encouraging farm employers to constantly monitor and seek to influence immigration policy decisions.

Farm Employers

California's 82,000 farms produce over 250 commodities worth nearly $14 billion in 1985. Dairy and livestock products account for 25 percent of California's farm sales, and cotton, hay, and rice are major crops, but the feature which distinguishes the state's farming is the commercial production of fruits and nuts, vegetables, and horticultural specialities (FVH). Most of these FVH commodities are considered labor-intensive because 100 or more hours of hand labor are required to cultivate, irrigate, and harvest an acre. Thus, a typical California wage bill of $1,000 per acre is ten times the gross revenue per acre of a Kansas wheat farmer.

California's farm labor market also differs from midwestern farm labor markets. A typical midwestern farm combines livestock and crop activities to keep the farm family busy year-round--for example, an Iowa corn and hog farm. Such farms employ only occasional "hired hands" as a supplement during busy periods; usually students or women who are otherwise not in the labor market. California's farm labor market is different because hired workers do most of the state's farmwork. Most of California's farms are owned and operated by farm families, but scale and specialization usually mean that hired workers do virtually all of the manual labor. Whether the California farm is a 30 acre strawberry farm, a 50 acre orchard, or a 1000 acre vegetable farm, hired workers usually do all of the hoeing and hand-harvesting. Even when the average size of California specialty crop farm is less than 20 acres, as in citrus and vineyards, hired workers do virtually all of the manual labor.

These FVH farms' need for workers fluctuates greatly. Farmworker employment on small farms many drop to one or two year-round workers during

the winter lull months and then expand to 30 or 60 workers during the busy spring pruning and fall harvesting seasons. These seasonal employment fluctuations mean that FVH farm workforces are annually assembled and then laid-off.

Labor-Intensive Agriculture

U.S. farming employs an average 3.7 million persons--2.4 million farmers and 1.3 million hired workers. The U.S. Department of Agriculture (USDA) estimates the average employment of farmers, unpaid family workers, and hired workers for each quarter of the year and then calculates annual average employment. This USDA estimate shows two farmers and unpaid family workers employed for each hired worker, implying that farmers and their families do two-thirds of the nation's farmwork (Table 1).

This USDA estimate is misleading because agriculture's dependence on hired workers varies by commodity, area, and size of operation. The importance of large fruit and vegetable farms in California means that hired workers do much more than one-third of the state's farmwork. California Employment Development Department (EDD) estimates indicate that an annual average of 60,000 farmers and 218,000 hired workers is employed in California, implying that hired workers do over 75 percent of the state's farm work. However, even this 75 percent average understates the almost total reliance on hired workers for manual labor on most commercial fruit and vegetable operations.

California's dependence on hired workers is explained by the importance of fruit and vegetable production in the state. In 1983, the major FVH commodities grown in the United States (Table 2) were worth $18.8 billion: vegetables, $8.2 billion; fruits and nuts, $6.2 billion; mushrooms,

Table 1. Employment of Farmers and Farmworkers, 1980-1984

	1980	1984
United States		
Family labor	2,402,300	2,315,000
Hired labor	1,303,000	1,435,000
Total	3,705,300	3,750,000
Percentage hired	35.2	38.3
California		
Family labor	65,000	67,000
Hired labor	197,000	206,000
Total	262,000	273,000
Percentage hired	75.2	75.4
Farmers and family	64,200	67,200
Hired labor	224,100	263,700
Total	288,300	330,900
Percentage hired	77.7	79.7

Sources: U.S. Department of Agriculture, Statistical Reporting Service, Farm Labor, Washington, D.C., 1981 and 1984; California Employment Development Department, Agricultural Employment Estimates, ED&R Report 881X, Sacramento, 1981 and 1985.

Table 2. Major Fruit and Vegetable Crops in the United States, 1982

Crop	Production				Portion of Total U.S. Fruit or Vegetable Land	Portion of Total U.S. Value	Average All Farms	Area per Farm Commercial Farms
	Area	Value	Processed	Mechanically Harvested				
	1000 acres	$ million	percent	percent	percent	percent	acres	acres
Fruit								
Citrus	1,288	1,796	70	0	27.1	26.9	66	na
Grape	875	1,310	90	25	18.4	19.6	35	42[1]
Apple	590	828	45	5	12.4	12.4	14	20[1]
Peach	248	299	55	15	5.2	4.5	10	16[1]
Plums & Prunes	140	183	75	60	3.0	2.7	13	na
Pear	85	148	60	0	1.8	2.2	6	na
TOTAL (all fruits)	4,751	6,669	--	--	--	--	38	80.6[a]
Vegetables								
Sweet Corn	642	339	70	80	19.3	4.2	22	27[b]
Tomato	403	1,146	70	65	12.1	14.2	23	25[b]
Green Pea	281	117	100	100	8.4	1.4	34	39[b]
Snap Bean	278	107	85	90	8.3	1.3	23	na
Lettuce & Romaine	230	722	0	0	6.9	8.9	94	na
Dry Onions	117	117	--	--	3.5	1.4	33	--
TOTAL	3,331	8,089	--	--	--	--	48	80[a]

[a]Farms with sales of $10,000 or more in 1982.

[b]1978 data.

Sources: U.S. Bureau of the Census, Census of Agriculture, 1982; U.S. Department of Agriculture, Economic Indicators of the Farm Sector, 1983; G. K. Brown, 1985.

$431 million; and nursery-greenhouse products, $4 billion. California accounted for 36 percent of FVH product sales with vegetables worth $2.8 billion; fruits and nuts, $2.8 billion; mushrooms, $100 million; and nursery-greenhouse products, $962 million. While some of these commodities are harvested mechanically, e.g., potatoes, processing tomatoes, tree nuts, most commodities in the FVH sector are still hand-harvested (Table 3). FVH commodities are one-eighth of U.S. crop sales but three-fourths of California crop sales.

The 6.6 million acres of U.S. fruits and vegetables require an average 120 hours of labor per acre compared to only about three hours per acre in grains. About 11 percent of all fruits are mechanically-harvested; and for individual commodities mechanization ranges from none for citrus and pears to 60 percent for plums and prunes. About 63 percent of all vegetables are machine-harvested; lettuce is the only major vegetable which is completely hand-harvested.

Two major vegetables--tomatoes and lettuce--account for almost half of total acreage and value. Note that the average vegetable farm is four times larger than the average fruit farm, and that there is greater variation in labor requirements per acre across fruit crops than vegetable crops.

California's importance in fruit and vegetable farming has increased. Until 1950, most fresh fruits and vegetables were consumed on the farm or sold seasonally through local or regional markets. Since 1950, the development of fruit and vegetable cultivars which can be handled and transported with minimal damage and the increase in incomes that has sustained year-round demand for fruits and vegetables, have encouraged the fruit and vegetable industry to expand and concentrate in California.

Table 3. Major Fruit and Vegetable Crops in California, 1982

Crop	Production				Portion of Total Calif. Fruit or Vegetable Land	Portion of Total Value	Hours Per Acre	
	Area	Value	Processed	Mechanically Harvested			Regular Workers	Temporary Workers
	1000 acres	$ million	percent	percent	percent	percent		
Fruit								
Raisin Grapes	757	1,194	90	25	35	36	28	112 (raisin)
Oranges	172	352	70	0	8	11	38	64 (navel)
Strawberries	12	294	45	5	1	9	169	3610
Plums & Prunes	122	170	75	60	6	5	26	202 (plums)
Peaches	74	131	55	15	3	4	48	245 (cling)
Lemons	51	97	60	0	2	3	95	164
TOTAL	2,158	3,296	--	--	--	--	--	--
Vegetables								
Tomato	252	569	70	65	28	21	89	644 (pole)
Lettuce	164	469	0	0	18	18	29	116
Broccoli	66	177	70	80	7	7	--	--
Celery	23	129	100	100	3	5	34	270
Carrots	33	118	85	90	4	4	50	340
Onions	29	99	--	--	3	4	27	298 (dry)
TOTAL	895	2,670	--	--	--	--	--	--

Sources: U.S. Bureau of the Census, Census of Agriculture, 1982; U.S. Department of Agriculture, Economic Indicators of the Farm Sector, 1983; G. K. Brown, 1985; Seasonal Labor in California Agriculture, 1964.

Hand-harvested fruits and vegetables are high risk but potentially high profit commodities. One acre (a football field) of California strawberries generates an average $25,000 in gross revenues, compared to less than $100 for an acre of Kansas wheat. Most FVH commodities generate gross revenues of $2,000 to $4,000 per acre, slightly more than production costs, but if producers elsewhere suffer weather or disease problems, per acre returns can double or triple, and most of the additional revenue is profit.

FVH commodities include capital-intensive perennials and short-season vegetables. Perennials such as grapes and tree fruits require three to seven years to reach maximum yields, but lettuce matures 60 days after planting. Perennial production by its nature is less responsive to changing prices. Farmers who invest in orchards or vineyards incur interest and cultivation costs while waiting for the first fruit. However, the investment is a sunk cost: In a declining market, most farmers will stay in business and hope that prices rise rather than risk losing their equity by selling land at depressed prices or removing the trees or vines.

Production response is much more rapid in vegetables. Two or three months after a vegetable is planted, it must be harvested or abandoned. Most hand-harvested vegetables such as lettuce and broccoli do not ripen uniformly. Yet growers usually make only two or three passes through a field, harvesting only 60 to 80 percent of the potential yield. More harvest passes are not justified by prices that fail to cover harvesting costs for the smaller yields of later cuttings. Much of California's vegetable land is leased; rents range from $200 to $400 in the Stockton vegetable-growing area to $1,000 per acre in coastal areas.

Each FVH commodity has an optimal harvest window, but these windows vary from crop to crop. Citrus can be stored on the tree for several weeks, while grape and tree fruit harvests can be shifted by only three to five days. The most perishable commodities such as asparagus and strawberries have optimal harvesting windows of less than three days.

Some labor-intensive commodities are grown in controlled environments, e.g., mushrooms. Much of the state's greenhouse and nursery industry has at least partial control over the environment. Controlled environment cultivation removes the "unpredictable weather" cause of employment fluctuations.

Farms and Farm Employers

Most farms in California are very small. The 1982 Census of Agriculture reported that 28 percent of California's farms had fewer than 10 acres, and almost 52 percent of the state's farms sold less than $10,000 worth of farm products. More than half of California's "farmers" reported that farming was not their principal occupation, and 23 percent of the "primarily farmers" reported they did not live on their farms. Census statistics reflect the large number of hobby, part-time, and retirement farms.

The 1982 Census of Agriculture reported that one-half of all California farms (40,057) hired a total of 811,000 workers and paid $1.8 billion in wages, the "average" farm employer hired 20 workers and paid the, $44,960 or $2,248 each. A total of 18,149 farms paid $414 million to farmworkers through labor contractors, or $22,811 per farm. (Table 4). The farm wage bill of $2.2 billion is the largest single expense of California farmers, exceeding

Table 4. California Farm Employers and Wages, 1959-1982

	1959	1964	1969	1974	1978	1982	Percentage 1969-82	Change 1974-82
Direct Hire Farms								
Farms	99,232	80,715	77,875	67,674	73,194	82,463	5.9%	21.9%
Farm Employers	62,284	49,082	47,287	31,268	41,045	40,057	-15.3%	28.1%
Farmworkers[a]	145,215[b]		777,084	861,343	813,938	810,704	4.3%	-5.9%
Regular[c]	80,280	122,521	105,381	136,216	165,327	169,954	61.3%	24.8%
Seasonal[c]	64,935	N/A	671,703	725,127	648,611	640,750	-4.6%	-11.6%
Wages ($ millions)	499	557	633	1,043	1,371	1,819	187.4%	74.4%
Large Employers[d]	1,658	2,008	2,363	3,630	4,816	5,825	146.5%	60.5%
-wages ($ millions)	N/A	302	N/A	789	1,095	1,541	--	95.3%
-percent of all wages		54.2%		75.6%	79.9%	84.7%	--	--
Large Farms[e]	12,302	15,466	13,933	2,688	3,515	4,743	-66.0%	76.5%
-wages ($ millions)	388	482	560	668.5	922.6	1,363	143.4%	103.9%
-percent of all wages	77.8%	86.5%	88.5%	64.1%	67.3%	74.9%	--	--
FVH Employers[f,g]	10,720	20,658	20,738	18,458	40,262	27,713	33.6%	50.1%
-wages ($ millions)	251	275	317	657	913	1,240	291.2%	88.7%
-percent of all wages	50.3%	49.4%	50.1%	63.0%	66.6%	68.2%	--	--
FVH Workers								
-regular	32,789	57,036	50,926	84,037	110,465	116,800	129.4%	39.0%
-seasonal	37,563	N/A	507,327	574,289	529,714	534,700	28.4%	13.4%
Contract Labor Farms[h]	46,513	42,128	42,631	13,330	20,168	18,149	-57.4%	36.2%
Wages ($ millions)[i]	99	162	246	186	291	414	68.3%	122.6%

[a]The number of jobs: One farmworker employed on several farms is counted several times.
[b]Figures for 1959 pertain only to workers working the week preceding the census.
[c]Regular workers are employed on the same farm for 150 days or more; seasonal workers are employed on the same farm for less than 150 days.
[d]Large employers are those in the highest farm wage category, e.g., $50,000 or more in 1982.
[e]Large farms are those in the highest farm sales category, e.g., $500,000 or more in 1974-1982.
[f]Fruits and Nuts (017), Vegetables and Melons (016), and Horticultural Specialties (018). The Census did not include horticulture until 1974 because the census did not consider it a separate type of farm until then.
[g]Figures are for farms with over $2,500 in sales.
[h]These categories include contract labor, machine hire, and custom work.
[i]Farms with over $10,000 or more in contract labor expenditures.

Source: U.S. Bureau of the Census, Census of Agriculture, various years.

combined farm expenses for chemicals, energy and petroleum, and interest payments ($2.1 billion).

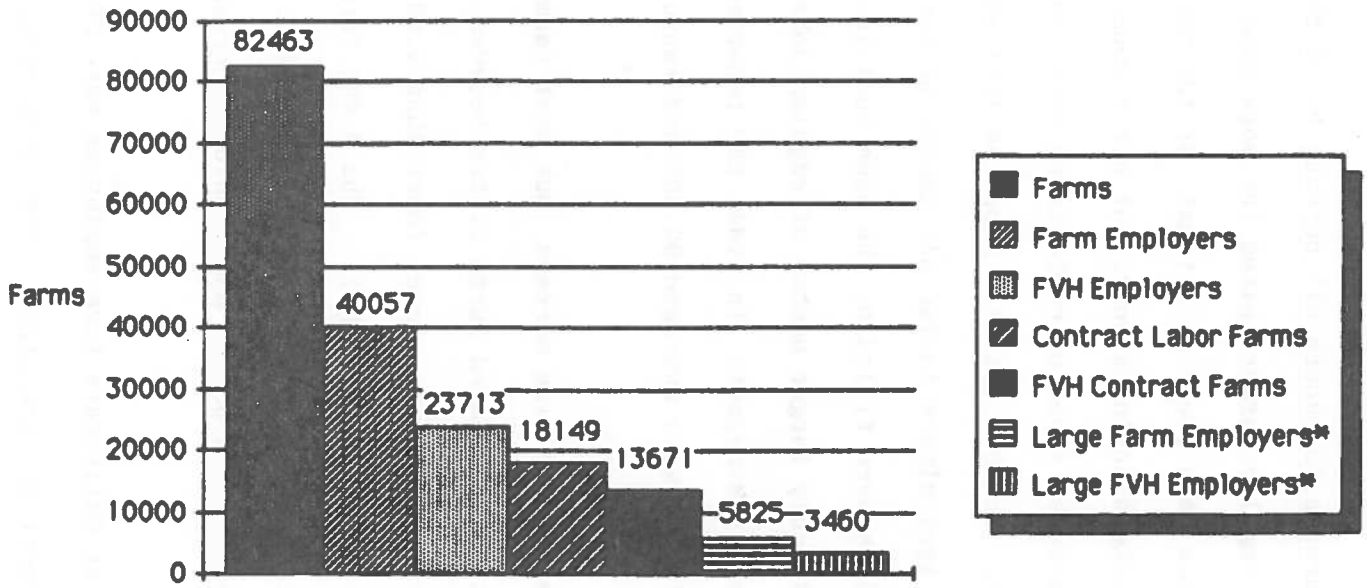
The census asks farmers to record all persons hired during the year and to distinguish between regular workers hired for more than 150 days and seasonal workers. Census data yield an estimate of the number and type of jobs created for farmworkers during a year, but not a count of individuals who worked in agriculture because a person employed on more than one farm is recorded by each farmer. In 1982, farmers reported that about one-fifth of the jobs in California agriculture lasted six months or more; that is, farmers reported that 170,000 jobs were filled by the same individual 150 days or more. This is a considerably larger number of regular jobs than that estimated by EDD in its 881-M report: In 1984, EED reported that the number of jobs filled by regular workers averaged 99,000 and ranged from 86,000 to 106,000.

Half of California's farms hire workers, but most farm wages are paid by large farms. Farms can be considered large either because of their wage bills or their total farm sales. In either case, fewer than 6,000 California farms pay at least three-fourths of the wage bill: The 5,800 farms that each paid $50,000 or more in wages, paid 85 percent of the wage bill; the 4,700 farms that each had farm sales of $500,000 or more, paid 75 percent of the wage bill.

Almost 70 percent of California farm employers were FVH farmers in 1982; they paid almost 70 percent of farm wages. FVH farms created a total of 651,000 jobs--80 percent of all the jobs in California agriculture. However, FVH jobs were mostly seasonal; only 18 percent of the FVH jobs were filled by the same worker 150 days or more (Figure 1).

Figure 1

Number of California Farms and Farm Employers, 1982



*Paid $50,000 or more in wages in 1982.

Source: U.S. Bureau of the Census, Census of Agriculture, 1982, Washington, D.C., 1984.

The Census of Agriculture changes its definitions and methods periodically, making over time comparisons difficult. The census most comparable to 1982 is 1974. Table 4 indicates that between 1974 and 1982, the number of farm employers increased faster (28 percent) than the number of farms (22 percent), and the number of farms using FLCs increased even more (36 percent). The wage bill for workers hired directly rose 74 percent, and for contract labor jumped 123 percent. The number of regular jobs statewide increased 25 percent, while seasonal jobs fell 12 percent. Large farm employers, large farms, and FVH farms all increased their shares of the wage bill.

Census data for earlier years are incomplete. Since 1969, the number of farm employers first dropped and then stabilized at 40,000. The 1959 census employment data are questionable, but in more recent years the number of farm jobs appears to have stabilized at 800,000. FVH farms pay an increasing share of the wage bill, and wages for contract labor have increased much faster than the number of farms using FLCs. Note that "contract labor farms" in 1959, 1964, and 1969 also include farms using services such as fertilizer distributors.

The farm wage bill is more concentrated on large farms in California than in most other states (Table 5). The number of farms directly hiring workers increased in California, Florida, and Texas in the 1970s, but the larger farms still pay most farm wages. In 1978, there were 16,700 U.S. farms that sold $500,000 or more in farm products, including 3,500 in California, 1,000 in Florida, and 1,200 in Texas. These large farms accounted for only 16 percent of U.S. farm jobs, but for 40 percent of the California jobs, 55 percent of the Florida jobs, and 12 percent of the Texas jobs. Large farms in these

Table 5. United States, California, Florida, and Texas Farm Employers in 1978 and by Sales-Value Size of Farm

Hiring	Farms	Percentage of all Farms	Workers Employed	Total Wages ($1,000)
U.S. Farms	2,478,642	100.0%		
Employers	983,706	39.7%	5,615,519	6,849,036
Contract Labor	176,901	7.1%		908,048
California Farms	81,706	100.0%		
Employers	41,116	50.3%	824,474	1,375,184
Contract Labor	21,201	25.9%		294,450
Florida Farms	44,017	100.0%		
Employers	15,040	34.2%	207,372	387,599
Contract Labor	7,345	16.7%		172,922
Texas Farms	194,141			
Employers	72,229	37.2%	297,871	430,935
Contract Labor	30,049	15.5%		86,936
Employers With Farm Sales of $500,00 or More				
United States	16,723	0.7%	876,112 (15.6%)	2,589,961 (37.8%)
California	3,515	4.3%	332,865 (40.4%)	922,552 (67.1%)
Florida	947	2.1%	113,727 (54.85)	273,639 (70.6%)
Texas	1,221	0.6%	35,366 (11.9%)	136,093 (31.6%)
$100,000-$499,999				
United States	162,070	6.5%	1,380,735 (24.6%)	2,448,452 (35.7%)
California	8,742	10.7%	229,986 (27.9%)	320,653 (23.3%)
Florida	2,551	5.6%	40,753 (19.6%)	76,583 (19.7%)
Texas	9,997	5.1%	66,515 (22.3%)	165,706 (38.4%)
$40,000-$99,999				
United States	225,065	9.1%	1,174,036 (21.0%)	1,027,751 (15.0%)
California	6,739	8.2%	109,887 (13.3%)	74,967 (5.5%)
Florida	2,345	5.3%	19,725 (9.5%)	21,805 (5.6%)
Texas	11,658	6.0%	52,909 (17.8%)	68,362 (15.9%)
$10,000-$39,999				
United States	268,635	10.8%	1,189,551 (21.2%)	495,949 (7.2%)
California	9,112	11.2%	91,732 (11.1%)	36,529 (15.9%)
Florida	3,602	8.2%	71,449 (8.4%)	10,351 (2.7%)
Texas	19,804	10.2%	68,343 (22.9%)	39,030 (9.0%)
$1,000-9,999				
United States	309,622	12.5%	979,505 (17.4%)	228,568 (3.3%)
California	12,937	15.8%	58,887 (7.1%)	16,300 (1.2%)
Florida	5,595	12.7%	15,698 (7.6%)	5,221 (1.3%)
Texas	30,549	15.7%	74,738 (25.1%)	21,743 (50.0%)

Source: U.S. Bureau of the Census, Census of Agriculture, 1978.

states paid higher than average wages, since their percentage of wages paid is greater than their percentage of jobs. The largest farms paid 67 percent of total wages reported in the California census, 71 percent in the Florida census, and 32 percent in the Texas census.

California farms also hire workers indirectly through farm labor contractors (FLCs). About one-fifth of all California farms used contract labor in 1982, and contract wages totalled $414 million. Contract wages are also concentrated on the largest farms: The 3,400 farms that each paid $20,000 or more to contractors, paid 86 percent of all contract wages; the 1,900 large farms that each sold $500,000 or more in farm products, paid 63 percent of the contract wage bill. Almost 75 percent of all contract labor users were FVH farms and they paid 82 percent of the contract wage bill.

Thus, census data emphasize the concentration of farm wages on the largest farms. But the census does not provide detailed wage data. American Labor Relations Board cases indicate that many of the largest California farm employers have annual wage bills of $1 million to $10 million annually. If the 300 largest farm employers had average annual payrolls of $3 million each, then one-half of California's farm wages would be paid by these farms. Fruit and nut (Standard Industrial Code, 017), vegetable (016), and horticultural specialty (018) farms dominate California's farm employment statistics (Table 6). However, there are significant differences among these types of farm employers. The 1,800 vegetable farm employers have the highest average wage bills--$187,400 for labor hired directly and $101,000 for contract labor in 1982. Vegetable farms accounted for 15 percent of the state's regular farm jobs and 13 percent of the seasonal jobs. The 20,000 fruit and nut farm employers averaged $31,400 in direct wages and $19,400 for contract labor and

Table 6. California Fruit and Vegetable Employment and Wages, 1982

	Vegetables and Melons	Percent[a]	Fruits and Nuts	Percent[a]	Horticultural Specialties	Percent[a]	California
All Farm Employers	1,845	4.6	19,935	49.8	1,933	4.8	39,994
Workers	118,260	14.6	481,468	59.4	51,795	6.4	810,119
Workers per Farm	64.1	--	24.2	--	26.8		20.2
Wages ($)	345,703,000	19.0	625,043,000	34.4	269,571,000	4.1	1,817,353,000
Wages per Farm ($)	187,373	--	31,354	--	139,457	--	45,441
Wages per Worker ($)	2,923	--	1,298	--	5,204	--	2,243
Seasonal Farm Employers	1,554	4.7	17,875	53.6	1,361	4.1	33,355
Seasonal Workers	84,275	13.2	422,461	66.0	27,877	4.3	640,364
--per farm[b]	54.2	--	23.6	--	20.5	--	19.2
Regular Farm Employers	1,379	6.7	8,428	40.9	1,569	7.6	20,593
Regular Workers	33,985	20.0	59,007	34.8	23,918	14.1	169,755
--per farm[b]	24.6	--	7.0	--	15.2	--	8.2
Contract Labor Farms	953	5.2	12,279	67.6	439	2.4	18,140
Contract Wages ($)	96,195,000	23.2	237,702,000	57.4	7,475,000	1.8	413,575,000
--per farm ($)	100,939	--	19,358	--	17,027	--	22,799
Total Wages per Farm ($)[c]	288,312	--	50,712	--	156,484	--	68,240

[a]Percent of total California farm employers, workers, or wages, respectively.

[b]Does not equal line 3, workers per farm, because some farms hire only seasonal or regular workers and some hire both.

[c]Not all farms hire workers directly and utilize contractors, so this "total" is not an average for all farm employers.

Source: U.S. Bureau of the Census, Census of Agriculture, 1984.

accounted for almost 60 percent of all farm jobs and two-thirds of the seasonal jobs. The 1,900 horticultural specialty farm employers averaged $140,000 in direct wages and $17,000 in contract wages and accounted for 14 percent of the regular jobs and 4 percent of the seasonal jobs. Thus, vegetable farms have the highest wage bills; in fact, their $288,000 average wage bill exceeds the farm sales of 96 percent of the nation's farms.

The size and labor intensity of FVH farms are apparent in per farm census averages. The average California farm employer hired 20 workers directly in 1982 and paid each worker $2,248, generating a wage bill of $44,960. In addition, many of these same farm employers used FLCs at a cost of about $22,811 per farm. Thus, the average California FVH wage bill of $67,771 is greater than the gross receipts of three-fourths of the nation's farms.

California's labor-intensive farms are also large employers compared to nonfarm employers. The 1977 Census of Manufacturers reported that manufacturing establishments employed 19.6 million workers, or 54.5 workers per establishment. California vegetable farms averaged 64.1 workers. The average California fruit and nut farm hired 24 workers, the average specialty crop farm 27 workers, and the average of all farms was 20 workers.

Average seasonal and regular employment per farm does <u>not</u> equal "workers per farm" (Table 6, line 3) because many farms hire both regular and seasonal workers, making the total number of regular (20,593) plus seasonal (33,555) farm employers much larger than the total number of farm employers (39,994). Because the employer groups include some but not all of the 1,379 regular vegetable employers--it is not possible to say what percentage of an average farm's jobs are regular vs. seasonal. However, it is clear that fruit farmers

are the major creators of both seasonal (66 percent) and regular (35 percent) farm jobs.

Thus, FVH operations are the most important farm employers in California, accounting for 59 percent of the state's farm employers, 69 percent of the regular jobs and 84 percent of the seasonal jobs, and paying 58 percent of the farm wage bill. Nationwide, FVH farms are 8 percent of all farm employers, hire 29 percent of the hired work force, and pay 33 percent of the wage bill. In contrast to agriculture elsewhere, labor-intensive agriculture and FVH farming are virtually synonymous in California.

Another perspective on farm employers can be obtained from California unemployment insurance (UI) data. Every quarter, virtually all farm employers are required to report the names and earnings of their workers and average employment during the second week of the month. In 1985, a total of 30,933 farm employers reported paying $4.2 billion to an average 384,769 farmworkers. California farmers paid $117 million in UI taxes in 1985, and unemployed farmworkers collected $240 million in UI payments.

The regional classification adopted here emphasizes the unique production and employment characteristics of each region, including the dominance of orchards and vineyards in the Sacramento, San Joaquin, and North Coast regions and the importance of vegetables in the Central and South Coasts. The regional distribution of total, regular, and seasonal farmworkers estimated by the California Employment Development Department (EDD) over the three-year period, 1979 through 1981, is presented in Table 7.

Southern California had 20.3 percent of average total employment, 26.1 percent of average regular employment, but only 15.3 percent of average seasonal employment, reflecting the importance of nurseries and feedlots which

Table 7. The Regional Distribution of California Farmworkers Over the Period, 1979-1981

	Total		Regular		Seasonal	
	Farmworkers	Percent	Farmworkers	Percent	Farmworkers	Percent
Southern California	134,040[a]	20.3	79,940[a]	26.1	54,100[a]	15.3
South Coast	66,590	10.1	30,140	9.8	36,450	10.3
Central Coast	71,030	10.8	44,680	14.6	26,950	7.6
San Joaquin Valley[b]	312,300	47.4	112,960	36.9	199,340	56.4
North Coast	23,850	3.6	15,810	5.2	8,040	2.3
Sacramento Valley	51,320	7.8	22,620	7.4	28,700	8.1
California	659,130[c]	100.0	306,150	100.0	353,580	100.0

[a]Three-year sum.

[b]Includes San Joaquin with 4 percent of average total employment.

[c]There are 16 counties that do not qualify as major agricultural employment counties. Estimates of their annual average employment are not presented separately but are included in the three-year California statewide total (666,900); Regular (310,810), and Seasonal (356,100).

Source: California Employment Development Department, Agricultural Employment Estimates Report 881-X, 1984.

employ more regular workers. The San Joaquin Valley, on the other hand, had 47.4 percent of average total employment, only 36.9 percent of average regular employment, but 56.4 percent of average seasonal employment, reflecting the labor requirements of tree fruits and grapes. The North Coast and Sacramento Valley had 11.4 percent of average total employment, 12.6 percent of average regular employment, and 10.4 percent of average seasonal employment, reflecting the tendency of mechanized tree fruit and nut farms to employ the same workers for a variety of tasks: pruning, irrigation, and operating equipment. The Central and South Coast regions had 20.9 percent of average total employment, 24.4 percent of average regular employment, and 19 percent of average seasonal employment, reflecting the importance of long-season citrus and vegetable jobs in the coastal valleys.

County-level detail highlights the importance of the major farmworker counties (Table 8). Fresno County with 30,050 workers, Tulare with 23,900, and Kern with 19,840 accounted for one-third of the state's average farm employment in 1980. Average seasonal employment in these counties (47,600) was 40 percent of the statewide average 119,500 seasonal jobs.

A joint University of California, Davis-EDD survey in 1983 confirmed the picture that most regular workers are employed in Southern California and the coastal regions, while more seasonal workers are found in the Central Valley. Southern California, for example, had a disproportionate share of Mexican workers settled in California with their families despite the well-known cross border migrants to Imperial and San Diego counties. The San Joaquin Valley had a disproportionate share of the Mexican men unaccompanied by their families, i.e., those most likely to take seasonal harvest jobs.

Table 8. The Distribution of California Farmworkers by County and Region, 1981

	1981					
	Total[a]	Percent	Regular	Percent	Seasonal	Percent
California	222,700	100.0	103,100	100.0	119,600	100.0
So. California	44,800	20.1	27,040	26.2	17,760	14.8
Los Angeles	8,880		7,740		1,140	
San Bernardino	5,110		4,400		710	
Orange	4,930		2,200		2,730	
Riverside	10,440		4,810		5,630	
San Diego	9,270		5,640		3,630	
Imperial	6,170		2,250		3,920	
South Coast	22,540	10.1	10,060	9.8	12,480	10.4
Ventura	15,770		6,950		8,820	
Santa Barbara	5,070		2,470		2,600	
San Luis Obispo	1,700		640		1,060	
Central Coast	23,550	10.6	14,630	14.2	8,920	7.4
Monterey	10,320		7,560		2,760	
San Benito	1,630		710		920	
Santa Cruz	3,100		1,770		1,330	
Santa Clara	4,010		1,880		2,130	
San Mateo	1,840		1,140		700	
Alameda	1,910		1,350		560	
Contra Costa	740		220		520	
San Joaquin Valley	104,730	47.0	37,120	36.0	67,610	56.5
Kern	20,530		8,930		11,600	
San Joaquin	8,480		2,140		6,340	
Tulare	25,470		7,500		17,970	
Kings	4,640		2,230		2,410	
Fresno	28,630		9,970		18,660	
Madero	4,200		2,030		2,170	
Merced	6,850		1,940		4,910	
Stanislaus	5,930		2,380		3,550	
North Coast	7,830	3.5	5,220	5.1	2,610	2.2
Napa	2,500		1,880		620	
Sonoma	4,200		3,050		1,150	
Lake	650		150		500	
Mendocino	480		140		340	
Sacramento Valley	16,730	7.5	7,490	7.3	9,240	7.7
Solano	1,660		670		990	
Sacramento	2,450		1,280		1,170	
Siskiyou	750		410		340	
Modoc	560		260		300	
Sutter	1,620		820		800	
Tehama	750		300		450	
El Dorado	210		70		140	
Colusa	1,050		510		540	
Butte	1,730		700		1,030	
Placer	420		150		270	
Shasta	680		290		390	
Yolo	3,010		1,210		1,800	
Yuba	710		320		390	
Glenn	1,130		500		630	

[a]County and regional totals do not equal state totals because some of the state's farmworkers are not assigned to any of the agricultural counties listed here.

Source: California Employment Development Department, Agricultural Employment Estimates, Report 881-X, 1984.

Summary

Almost 40,000 California farms hire labor, but fewer than 6,000 large farms pay 75 to 85 percent of the state's wage bill. California agriculture depends on hired workers to do 75 to 80 percent of the state's farm work because labor-intensive fruits, vegetables, and horticultural (FVH) specialties account for almost three-fourths of California's crop sales. California produces 36 percent of the nation's FVH commodities.

Vegetable farms have the highest average wage bills and the greatest number of regular workers, while fruit farms create the most seasonal jobs. The importance of vegetables in the coastal valleys and southern California explains the higher-than-average share of regular farmworkers in these areas, and the concentration of fruit farming in the San Joaquin Valley accounts for the fact that over half of the state's seasonal jobs are there.

Farmworker Employment

In 1980, USDA reported that about 600 million hours of work were contributed to agriculture in the three Pacific states, the equivalent of 300,000 full-time person-years of work (2,000 hours). These hours were contributed by farmers and farm managers, unpaid family members, and regular and seasonal farmworkers.

There are no definitive statistics on the relative contributions of each of these groups, but three generalizations can be made. First, a full-time farmer, manager, or regular worker works as many hours as several seasonal workers. Second, there is considerable specialization by type of workers. Farmers and unpaid family members do most of the work on smaller livestock and field crop farms, while seasonal workers do most of the fruit and vegetable harvesting. Generally, shorter and higher peak demands for labor mean that more work is done by seasonal workers. For example, seasonal workers are more important in raisin grapes than in dairy farming. Third, fruits and vegetable in 1980 used 83 percent of the crop hours in the Pacific states, versus 33 percent in the nation as a whole. Also, the percentage of crop hours accounted for by FVH commodities has been rising; in the Pacific states it rose from 67 to 83 percent since 1950 (Table 9).

Farmworkers are divided into two groups based on their length of employment on one farm: Seasonal workers are employed on one farm less than six months, and regular workers are employed on the same farm more than six months. Both Census of Agriculture and EDD data indicate that the number of regular workers is increasing in California. The peak demand for seasonal

Table 9. Hours of Farm Work: United States and the Pacific Region, 1950-1983

	Total Hours	Livestock	Crops	Vegetables	Fruits & Nuts	Vegetables and Fruits; Percent of Crop Hours
	---millions of hours---					
United States						
1950	15,137	5,548	6,922	643	619	18
1960	9,795	3,826	4,590	438	531	21
1970	5,896	2,344	2,788	359	452	29
1980	4,281	1,264	2,443	314	496	33
1983	3,681	1,080	2,126	301	443	35
Pacific Region						
1950	1,093	296	623	124	291	67
1960	871	233	529	126	238	69
1970	649	148	423	129	203	78
1980	603	79	452	145	229	83
1983	559	72	420	147	207	84
Percentage Changes in Hours between 1950 and 1983						
United States						
	-76	-81	-69	-53	-28	94
Pacific Region						
	-49	-76	-33	18	-29	25

Source: U.S. Department of Agriculture, Economic Indicators of the Farm Sector: Production and Efficiency Statistics, 1983, Washington, D.C., 1985, Tables 32 and 33.

workers has declined since the 1960s, but seasonal workers still out-number regular workers.

The seasonal nature of California agriculture causes farmworker employment to rise and fall during the year. For example, in 1984 seasonal farmworker employment dropped to a low of 77,000 in February and rose to a peak of 179,000 in September--a peak-trough ratio of 2.3, i.e., there were 2.3 seasonal workers employed in September for each one in February.

The peak demand for seasonal farmworkers moves from south to north. The first peak occurs in the Imperial Valley vegetable harvest, which employs 8,000 seasonal farmworkers in January and February. Also, during these winter months, about 5,000 workers harvest the state's winter citrus crop, and about 25,000 workers prune the state's orchards and vineyards.

Farmworker employment peaks in the summer months. Seasonal peak employment has been extended by the development of earlier and later varieties from June through September. Seasonal worker employment increases to 160,000 in June and then peaks at 180,000 in September. By June, the coastal vegetable districts from Salinas to Ventura are in full operation; citrus in the San Joaquin and Ventura still requires harvest workers; soft tree fruits such as plums and peaches are ready for thinning; very labor-intensive crops such as asparagus, cherries and strawberries need harvest work forces; and the state's large acreage crops such as cotton and processing tomatoes need to be thinned and weeded.

Farm labor activity remains at high levels during the traditionally busy July-August-September quarter. In July and August, seasonal worker employment shifts to table grapes, soft tree fruits, and melons in the Central Valley.

The September grape harvest marks the statewide peak demand for seasonal farmworkers, when 180,000 are employed. Raisin grapes require more workers than any other single commodity: One seasonal worker is required for every five acres, so the state's 280,000 acres of raisin grapes employ about 56,000 harvest workers. In the past, wine grapes also employed 50,000 seasonal workers, but today about 40 percent of the state's wine grapes are harvested mechanically. September is also the peak month for the employment of equipment operators who harvest and transport field crops such as cotton and rice, processing tomatoes, and tree nuts.

After September, seasonal employment peaks are local rather than state-wide. The olive harvest in the San Joaquin Valley, fresh tomatoes in Southern California, and apples in Central and Northern California require harvest workers, but most employers begin to lay off seasonal workers in the fall.

Employment, Work Force, and Hours

There are three farm labor market parameters: average employment, total work force, and hours worked. Each parameter describes one part of the farm labor market.

Average Employment. Average employment is the number of persons employed during a particular time period such as one day or one week. In California, estimates of average employment are reported each month for farmers, regular workers, and seasonal workers in the EDD 881 publications. The annual average farm employment in 1984 was 278,000--meaning that an average of 60,000 farmers, 99,000 regular workers, and 119,000 seasonal workers were employed during the 12 survey periods. Since 1960, seasonal farmworker employment has been

stable, regular farmworker employment increased 10 percent, and the average employment of farmers and unpaid family workers declined 40 percent Table 10).

The Total Work Force. The total farm work force indicates the number of persons who filled these 228,000 "twelve month equivalent jobs" for farmworkers in 1984. If all farm jobs lasted 12 months and there was no worker turnover, the total work force would equal average employment. But farm jobs begin and end, and farmworkers enter and leave the farm work force, so the total farm work force exceeds average employment. In 1984, about 620,000 persons filled the average 228,000 jobs available to hired workers, a ratio of 2.7 workers for each year-long equivalent job. Since 47 percent of these "year-long jobs" were filled by regular workers, a reasonable worker-job ratio of 1.5 for the regular labor market implies that there were 3.7 seasonal workers for each year-long equivalent seasonal job. For example, one seasonal worker working five months, another four, another two, and another one month would add up to one of the 119,000 year-long seasonal jobs reported in the EDD 881 report.

Hours. The USDA estimates the total number of hours required each year to produce the nation's food and fiber. In 1980 a total 4.3 billion hours of farm work was performed, 30 percent in the livestock sector and 70 percent to produce crops, and fruits and vegetables required 33 percent of the nation's crop hours. USDA reports these estimates of hours worked only for regional groupings of states. California is included with Oregon and Washington in the Pacific region and these Pacific states required 600 million hours of farm labor in 1980; 83 percent of the 450 million crop hours were in fruits and vegetables.

Table 10. California Agricultural Employment by Type of Worker, 1950-1980

California	1950 total hired	1960 total hired	1970 total hired	Regular as a percentage of total, 1970	1980 total hired	Regular as a percentage of total, 1980
California	217,800[a]	192,000[b]	211,000	46.0%	224,100	46.7%
Southern California	42,950	39,980	42,020	61.1%	45,160	59.8%
Los Angeles	15,140	11,030	7,440	81.2%	8,490	87.6%
San Bernardino	6,210	6,060	5,290	82.8%	5,060	86.9%
Orange	3,670	2,780	4,850	45.8%	4,910	44.4%
Riverside	8,120	9,660	10,580	65.3%	10,630	45.1%
San Diego	5,560	4,610	7,450	52.2%	9,820	60.5%
Imperial	4,250	5,840	6,410	34.9%	6,250	36.0%
South Coast	12,370	11,480	16,370	50.4%	22,450	43.0%
Ventura	6,550	7,350	9,750	50.7%	15,630	44.5%
Santa Barbara	4,050	2,450	4,770	50.1%	5,080	48.6%
San Luis Obispo	1,770	1,680	1,850	59.7%	1,740	44.8%
Central Coast	30,510	21,660	25,550	49.2%	24,070	62.1%
Monterey	5,060	3,700	9,020	43.2%	10,490	74.3%
San Benito	2,270	1,660	1,770	38.4%	1,570	42.7%
Santa Cruz	4,140	2,890	3,370	43.3%	3,340	55.1%
Santa Clara	11,350	7,250	5,130	48.5%	4,160	46.4%
San Mateo	1,740	1,280	1,870	66.8%	1,860	62.4%
Alameda	3,360	3,380	3,110	70.0%	1,910	70.7%
Contra Costa	2,590	1,500	1,280	49.2%	740	29.7%
San Joaquin Valley	97,630	89,980	101,860	37.5%	104,500	36.5%
Kern	20,610	15,860	19,600	34.4%	19,840	43.5%
San Joaquin	14,050	10,450	9,640	31.5%	8,900	28.3%
Kings	5,430	5,090	4,120	59.0%	4,640	48.5%
Tulare	11,770	16,230	24,300	30.9%	23,900	31.4%
Fresno	27,760	24,840	28,070	35.5%	30,050	33.4%
Madera	5,310	4,350	4,200	51.9%	4,460	46.5%
Merced	6,260	6,450	6,130	49.3%	6,740	27.4%
Stanislaus	6,440	6,710	5,800	56.7%	5,970	55.1%
North Coast	7,300	5,990	5,970	52.8%	8,060	66.0%
Napa	950	960	910	47.2%	2,730	77.6%
Sonoma	4,820	3,760	3,990	58.1%	4,040	71.5%
Lake	680	660	530	37.5%	690	23.2%
Mendocino	850	610	540	37.0%	600	25.0%
Sacramento Valley	24,470	19,580	17,350	47.4%	17,530	42.5%
Solano	3,310	2,180	1,520	41.4%	1,820	39.0%
Sacramento	5,510	3,570	1,740	53.4%	2,580	49.6%
Siskiyou	680	500	630	58.7%	610	55.7%
Modoc	740	700	550	54.5%	310	43.4%
Sutter	1,880	1,970	2,040	42.6%	1,770	48.6%
Tehama	1,260	900	900	50.0%	960	33.3%
El Dorado	630	460	340	58.8%	230	34.8%
Colusa	1,160	1,470	1,110	57.7%	1,070	49.5%
Butte	1,780	2,390	2,400	42.9%	1,930	37.8%
Placer	1,580	800	610	62.3%	450	35.5%
Shasta	540	440	540	42.6%	630	34.9%
Yolo	4,000	2,010	2,660	42.5%	3,200	38.7%
Yuba	610	960	1,050	41.9%	750	42.7%
Glenn	790	1,180	1,260	50.0%	1,220	41.8%

[a]Regular workers were 49.9 percent of the statewide total in 1950.

[b]Regular workers were 48.7 percent of the statewide total in 1960.

Source: California Employment Development Department, Farm Labor Report 881M, Sacramento, various years.

Mechanization and Production Expansion Since 1950

The employment, work force, and hours data illustrate an important farm labor market trend: Labor-saving mechanization has eliminated more jobs in field crop and livestock agriculture than in fruits and vegetables. Since 1950, hours of work in the Pacific states decreased 49 percent, but the decrease in livestock hours (76 percent) and field crops hours (62 percent) is much greater than the decrease in fruit and nut hours (29 percent). Fruit and vegetable agriculture has experienced labor-saving mechanization, but the expansion of fruit and vegetable acreage and production has partially offset the effects of mechanization and maintained a high demand for hand labor.

Thus, during the past three decades, the effects of labor-saving changes in California agriculture have been partially offset by labor-using trends. The major labor-saving changes include the mechanization of the tree nut, cotton, and processing tomato harvests; the substitution of precision equipment and herbicides for hand hoers and thinners; and the introduction of bulk bins and forklifts to handle harvested commodities in fields and orchards. Mechanization has yielded dramatic labor savings in certain commodities, e.g., processing tomatoes, where a few equipment operators and sorters have replaced 80 to 90 percent of the work force formerly needed to hand harvest the crop.

But these labor-savings have been offset by the expansion of fruit and vegetable agriculture. Acreages of hand-harvested commodities such as grapes and strawberries tripled, and yields often doubled or tripled with the introduction of improved plant varieties and cultural practices. This expansion greatly increased the demand for hired labor.

Engineering data provide a snapshot of current farm employment which shows that fruit harvesting tasks require most of the state's hand labor. A University of California, Davis, study calculated that about 232 million hours of work were required to produce California's major fruit and vegetable crops in 1976, an estimate congruent with the USDA estimate of 375 million hours for all the Pacific states (Kumar, Chancellor and Garret, 1978). The UCD data indicate that fruits required almost three-fourths of the 232 million California hours in 1976 (Table 11) and that grapes, oranges, and peaches required over 40 percent of all fruit and vegetable hours. More specifically, the 571,000 acres of grapes required 51 million hours or 22 percent of all fruit and vegetable hours. The 198,000 acres of navel and valencia oranges required 27 million hours or 12 percent, and the 72,000 acres of cling and freestone peaches required 16.5 million hours or 7 percent. The most important labor-intensive vegetables included lettuce (12.5 million hours), fresh tomatoes (5 million), processing tomatoes (14.5 million), and melons (5 million). Fresh and processing vegetables reuired 27 percent of all fruit and vegetable hours worked.

Fruit and vegetable hours can also be divided into categories that suggest the distribution of types of workers among various tasks. Although there is no official taxonomy of farm tasks, the heavy-hand, light-hand, and semi-skilled task breakdown is useful. These categories indicate that 113 million hours (49 percent) are required for heavy-hand tasks such as harvesting fruits and vegetables, 50 million hours (22 percent) are required for light-hand tasks such as weeding and sorting, and 61 million hours (26 percent) are in semi-skilled tasks such as irrigation and operating

Table 11. Labor Hours in California by Type of Labor, 1976

Crops	1,000 Acres	Total Labor Hours[a]	Heavy Hand Tasks	Light Hand Tasks	Semi-Skilled Tasks	Predicted Savings 1961-81 Heavy Hand	Predicted Savings 1961-81 Light Hand
		----------Millions of labor hours----------					
Fruits and Nuts							
Almonds	260.9	10.51	.32	2.63	7.37	.06	--
Apples	21.6	4.09	2.70	.90	.53	.19	.13
Apricots	27.9	3.73	2.05	1.12	.56	.03	.14
Cherries	13.0	3.70	3.37	.11	.22	.15	--
Raisin Grapes	236.7	20.99	12.59	5.25	3.36	.68	.05
Wine Grapes	270.8	21.66	11.70	5.85	4.11	3.30	.09
Table Grapes	63.2	8.69	3.13	3.82	1.74	--	.02
Lemons	47.5	6.95	4.73	.76	1.46	--	.04
Nectarines	13.1	3.30	2.21	.66	.43	--	.08
Oranges, navel	114.9	15.51	11.48	.62	3.41	--	.09
Cling peaches	49.8	9.62	5.96	1.92	1.83	.34	.02
Freestone peaches	21.7	6.79	4.96	1.15	.75	.09	.05
Pears	37.5	8.59	3.35	3.78	1.46	--	.30
Plums	24.7	5.78	4.22	.98	.58	--	.07
Prunes	74.3	3.54	.28	1.45	1.81	.21	.07
Walnuts	169.7	7.69	.23	2.15	5.31	--	--
SUBTOTAL	144.73	141.14	73.28	33.15	35.13	5.05	1.15
Dates[b]	4.1	.10	--	--	.10	--	--
Figs[b]	14.4	.36	--	--	.36	--	--
Grapefruit[b]	16.5	2.23	1.65	.09	.49	--	--
Valencias[c]	82.8	11.17	8.27	.45	2.46	--	--
Pomegranate[d]	2.1	.42	.26	.10	.06	--	--
Olives[e]	30.7	3.22	2.30	.31	.61	--	--
Avocados[f]	29.1	3.05	2.18	--	.87	--	--
SUBTOTAL	179.7	20.55	14.66	.95	4.95	--	--
TOTAL	1627.0	161.69*	87.94	34.10	40.08	--	--
Fresh Vegetable and Field Fruit							
Artichokes	10.5	1.15	.71	.20	.24	--	--
Asparague	32.1	1.77	1.43	--	.34	--	--
Broccoli	51.0	4.08	2.19	.80	1.09	--	.05
Cabbage	8.3	.77	.50	.19	.08	--	--
Brussel Sprouts	6.0	.56	.36	.14	.06	--	--
Cauliflower	26.2	2.53	1.57	.47	.49	.09	--
Celery	19.4	4.62	2.72	.55	1.35	.14	.02
Garlic	10.0	.92	.42	.20	.30	.10	--
Lettuce	156.1	12.49	6.24	1.87	4.38	.12	.38
Onions	7.1	.72	.53	.07	.12	.15	--
Tomatoes	29.8	5.36	4.47	.30	.59	.27	.06
Watermelons	9.8	1.13	.44	.39	.30	--	--
Cantaloupes[g]	36.3	4.18	1.63	1.44	1.11	--	--
Crenshaw[g]	1.2	.14	.05	.05	.04	--	--
Honeydew[g]	8.4	.99	.38	.33	.28	--	--
Spinach[h]	2.2	.23	.13	.04	.06	--	--
Peppers[h]	8.7	.88	.50	.15	.23	--	--
Cucumbers[h]	7.7	.77	.44	.13	.20	--	--
Sweet potatoes[h]	7.6	.77	.44	.13	.20	--	--
TOTAL	438.4	44.20*	25.15	7.45	11.46	.87	.51

Table 11, continued

Crops	1,000 Acres	Total Labor Hours[a]	Heavy Hand Tasks	Light Hand Tasks	Semi-Skilled Tasks	Predicted Savings 1961-81 Heavy Hand	Predicted Savings 1961-81 Light Hand
		----------Millions of labor hours----------					
Processing Vegetables							
(Lima) Beans	23.1	.25	--	--	.25	--	--
Carrots	33.1	.99	--	--	.25	--	--
Onions	21.3	.72	--	--	.72	--	--
Tomatoes	269.8	14.54	--	8.29	6.25	--	--
Potatoes	60.2	.48	--	--	.48	--	--
Sweet Corn[i]	15.9	.28	--	--	.28	--	--
Spinach[i]	9.7	.17	--	--	.17	--	--
Chili Peppers[i]	4.9	.09	--	--	.09	--	--
TOTAL	438.0	17.52	--	8.29	9.23	--	--
Total Vegetables							
	Total	Heavy Hand	Light Hand	Semi-skilled			
Fresh	44.06	25.15	7.45	11.46			
Processed	17.52	--	8.29	9.23			
TOTAL	61.58	25.15	15.74	20.69			
Field Crops							
(Hay) Alfalfa	1120	3.36	--	--	3.36	--	--
(Seed) Alfalfa	49	.02	--	--	.02	--	--
(Dry) Beans	1007	.19	--	--	.19	--	--
Barley	166	.50	--	--	.50	--	--
Corn	264	.26	--	--	.26	--	--
Rice	411	.68	--	--	.68	--	--
Safflower	110	.11	--	--	.11	--	--
Sorghum	183	.18	--	--	.18	--	--
Wheat	873	.44	--	--	.44	--	--
Cotton	1128	17.60	--	16.27	1.33	--	2.37
Sugar Beets	285	9.26	--	8.98	.28	--	1.42
TOTAL	--	36.60	--	25.25	7.35	--	3.79

[a]Total labor hours does not equal the sum of heavy, light and semiskilled due to rounding error.
[b]Ten hours/acre machine harvest, 15 other.
[c]Assumed same labor usage as navel oranges.
[d]Fifty hours prune; 100 hours harvest; 30 hours other.
[e]Ten hours prune; 75 hours harvest, 20 hours other.
[f]Seventy-five hours harvest; 30 hours other.
[g]Same as watermelon.
[h]57.32 heavy hand; 16.97 light hand; 26.07 semiskill per acre.
[i]Assumption 17.72 hours an acre figured as average of beans, carrots, onion, and potatoes.

Sources: R. Kumar, W. Chancellor, and R. Garret, "Estimates of the Impact of Agricultural Mechanization Developments on In-field Requirements for California Crops," in Technological Change, Farm Mechanization and Agricultural Employment, Publication No. 4085, University of California, Division of Agricultural Sciences, 1978.

equipment. This particular classification leaves 8 million hours unclassified.

The heavy-hand tasks include harvesting fruits and vegetables and thinning deciduous fruits. Most heavy-hand tasks are in tree fruits and grapes, and most are seasonal. Heavy-hand tasks required the equivalent of 57,000 full-time 2,000-hour-per-year workers in 1976. If the average heavy-hand worker was employed for 500 hours, the total number of heavy-hand workers would have been about 228,000. Most of these harvest workers are young immigrant men; some are illegal or undocumented.

Light-hand tasks include pruning grapes and other fruits, thinning and hoeing field crops, and sorting mechanically-harvested processing tomatoes. Light-hand tasks required the equivalent of 25,000 full-time workers in 1976, or about 100,000 individuals if the average light-hand worker did 500 hours of farmwork. Light-hand tasks are mostly done by older immigrant men and women who have settled in California with their families and by the teenage children from farmworker families. The tomato-sorting work force, for example, consists primarily of nonimmigrant Mexican-American women and their older children.

The semiskilled tasks include those in irrigation, operating equipment, and supervising field workers. Semi-skilled tasks required the equivalent of 30,000 full-time workers in 1976. If each semiskilled worker worked 1,000 hours, then the 1976 semiskilled work force would include 60,000 persons. Persons employed as irrigators comprise two-thirds of the semiskilled work force and, in 1976 irrigation required about one-sixth of the total hours expended by hired workers in California crops. Both irrigation and the other

semiskilled tasks attract somewhat older workers, especially Mexican or Mexican-Americans who have settled in California with their families.

What has happened since 1976? Estimates of hours worked by crop have not been updated. However, it appears that the effects of mechanization on labor needs have been offset by the continued expansion of acreage and production since the mid-1970s. The major labor-saving changes include the mechanical harvesting of about 40 percent of the state's wine grapes, electronic sorting of processing tomatoes, mechanical pruning, drip irrigation, precision planting of cotton and other field crops, and reduced acreages of some commodities, especially cling peaches. Changes in how often fields are picked and how commodities are handled have also reduced the number of hours needed to harvest citrus and other fruits.

Expanded acreages and increased production seem to have offset these labor-saving changes. Although strawberries were not included in the 1976 study, stawberry acreage increased to 14,000 acres in 1985 and now require about 35 million hours of work. Other labor-intensive crops substantially expanded their acreage: Avocados almost tripled to 75,000 acres in 10 years, nectarines jumped 77 percent to 23,000 acres, grape acreage increased by 20 percent, and acreages of vegetables such as broccoli and cauliflower also increased.

Future Demand for Farmworkers

For the past three decades, expansion has partially offset mechanization to maintain a stable demand for farmworkers. Will labor-using changes continue to offset labor-saving innovations in the 1990s?

The derived demand for farmworkers in California depends on consumer tastes, the production of fruits and vegetables in other states and nations,

and changes in production methods. California so far has benefited from most of these changes.

First, the annual per capita consumption of fresh fruits and vegetables in the United States rose 17 percent to 240 pounds between 1970 and 1983. Second, California fruit and vegetable acreage and production increased to meet the increase in consumer demand. In the 1950s and 1960s, the completion of major water projects expanded irrigation, bracero labor was available, and the interstate highway system allowed fruits and vegetables to be transported eastward at relatively low cost. Seasonal fruit and vegetable producers of the Northeast and Midwest could not control production as precisely as California growers and had attractive alternatives in government supported field crops. As producers elsewhere reduced fruit and vegetable production, competition for California fruits and vegetables was reduced, at least through the 1970s.

Third, mechanization slowed in the 1970s. The availability of moderate-wage workers in the 1970s slowed efforts to mechanize the remaining hand-harvested commodities. However, labor uncertainties and scientific advances may effectuate another wave of mechanization in the late 1980s.

The consumption, competition, and mechanization trends which stabilized California's farm labor market during the past 30 years may change in the 1990s. The increasing consumption of labor-intensive fruits, vegetables, and specialty crops seems likely to continue, but California faces increased competition from other states and nations. Within the United States, competition from midwestern and southern states promises to increase because of rising transportation costs and the decreased attractiveness of field crops.

Transportation costs may double the farm price of a California commodity in New York City; a typical farm lettuce price of $4.50 per 24-heads is $9 in New York because of transportation costs.[1] Trucking deregulation has tended reduce to transportation cost somewhat. However, the long distances required to ship California's perishable commodities give a cost advantage that encourages seasonal fruit and vegetable production in other locales closer to major eastern markets.

Declining acreages of tobacco, peanuts, and sugar cane free up land that could be devoted to fruit and vegetable production. Reducing federal price supports for sugar and tobacco, for example, could free up land and labor to grow fruits and vegetables. Consider, for example, the 300,000 acres of prime farmland in south central Florida devoted to sugarcane.

Competition from other nations will almost certainly increase. Mexico and Chile have established themselves as reliable producers of winter vegetables and fruits, and the Caribbean Basin Initiative (CBI) offers duty-free entry and U.S. assistance to establish winter fruit and vegetable enterprises in the 22 CBI nations. Initially, such projects will not threaten California summer producers, but these low-wage countries could extend their production seasons into California's early and late shoulder markets. CBI nations may also emerge as competitors in processed fruits and vegetables.

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[1]Because of changed export-import patterns, i.e., the shift from European to Pacific Rim dominated trade patterns, California produce no longer enjoys backhand rates for eastbound shipments (U.C. Agricultural Issues Center, 1987).

CBI competition is a future threat, but competition from Italy, Spain, Israel, South Africa, and New Zealand is a reality today. In wine grapes, citrus, almonds, processing tomatoes, apples, and kiwifruit, these countries have penetrated traditional U.S. and overseas markets that had been dominated by or open to California producers. The strong dollar and European Economic Community subsidies have also eroded California's comparative advantage.

Despite these competitive threats, California producers enjoy a number of advantages. California's predictable climate permits growers to plan much more precisely than producers in most other areas, and their ability to control water applications leads to higher quality commodities. The state's fruit and vegetable agriculture supports an array of specialized input suppliers and a corps of professional farmworkers. California's labor-intensive agriculture may shrink in the future, but its advantages mean that it will likely remain a formidable competitor.

Thus, domestic and foreign competition in fruits and vegetables may reduce demand for labor in California. And labor may also be displaced with further mechanization. Engineers have already developed machinery capable of harvesting most hand-picked commodities (Table 12). Most agricultural engineers assert that if a labor shortage developed, machinery would be available to harvest many hand-picked commodities.

Most harvest machinery is of the once over type: Field crop harvesters cut all the cotton or wheat that is ready; cucumber and tomato harvesters typically make one pass through each field; and tree and vine shakers harvest each tree or vine only once. Selective harvesting is most common in flue-cured tobacco, where a machine makes several passes through a field and harvests ripening leaves from bottom to top. A selective harvester checks the

Table 12. Technological Changes in the Harvest of Major California Crops (Estimates of Mechanization for 1981)

Crop	Percent Mechanized	Productivity Enhancer	Task Facilitator	Obstacles Productivity for Enhancement
Avocado	0	Shake and catch	Worker positioner	Two varieties on the same tree; steep slopes
Citrus	0	Shake and catch	Worker positioner	Processed and fresh fruit picked together; two cultivars on tree together
Dates	80	Hydraulic tower	--	--
Fig	100	Shake and pick up	--	--
Olive	0	Shake and catch	Worker positioner	Careful pruning, shaping required
Apples	15	Trellis system with over-the-row harvester	Worker positioner	Dwarf orchards needed; damage to fruit
Apricots	15	Shake and catch	Worker positioner	Uneven maturity
Cherries	10	Shake and catch	Worker positioner	--
Peach (cling)	20	Shake and catch	--	Damage to fruit, careful training of trees necessary
Peach (freestone)	0	Shake and catch	--	Damage to fruit, careful training of trees necessary
Pears	0	Shake and catch	--	Bruises to fruit, high sorting costs
Plums	0	Shake and catch, being introduced for process	--	Quick processing needed, pit fragments cause damage
Prunes	99	Shake and catch	--	For continuously moving, careful prune necessary
Strawberries	0	Mechanical finger strippers	Conveyor belt	Need weed, clod-free soil; increased labor for capping
Wine grapes	25	Rod or rail shakers	--	Excess debris in gondolas, special training of vines
Raisin grapes	7	Same as wine	--	Frost inhibits harvest
Table grapes	0	Same as wine	--	--

Table 12, continued

Crop	Percent Mechanized	Productivity Enhancer	Task Facilitator	Obstacles Productivity for Enhancement
Pickling cucumbers	25	Once over harvester	Conveyor	Low recovery
Cucumbers (fresh)	0	Selective harvester	Conveyor belts	Damage to vines, low recovery, careful cultural practices
Melons	0	Same as cucumbers	--	Same as cucumbers
Tomatoes (fresh)	10	Cut, lift and shake	Conveyor belts	Careful bed preparation fruit damage, debris removal
Peppers	0	Open helix	--	Debris removal, low recovery
Green onions	0	Diggers	--	Damage to plant
Radish	0	Diggers	--	Needs perfect spacing
Dry onions	50	Diggers	--	Easily bruised
Sweet potato	50	Diggers	--	Easily bruised
Asparagus	0	Reciprocating blades, selective harvester	--	Low recovery
Brussel sprouts	0	Rotary stripper	--	Cost
Cabbage	0	Life and cut	Conveyor belt	Damage to head
Celery	35	Transplanter	Conveyor belts, field pack	Shifting fields due to irrigation
Artichoke	0	Selective harvester	Field pack	Nonuniformity of crop
Broccoli	0	Selective harvester	Field pack	Nonuniform maturation
Cauliflower	0	Selective harvester	Conveyor belts	Damage to flower
Cotton	100	Precision planting	--	--
Sugar beets	80	Precision planting	--	--

Source: R. Kumar, W. Chancellor, and R. Garret, "Estimates of the Impact of Agricultural Mechanization Developments on In-field Requirements for California Crops," in Technological Change, Farm Mechanization and Agricultural Employment, Publication No. 4085, University of California, Division of Agricultural Sciences, 1978.

maturity of each item, e.g., each head of lettuce or each orange, before signalling the cutting mechanism to harvest it. A selective lettuce harvester that passes gamma rays through each head of lettuce to test its maturity has been developed but is not being used.

Most fruit and vegetable mechanization relies on nonselective harvesters. Thus, the major obstacles are to get the commodity to ripen uniformly and then to withstand mechanical harvesting and sorting. Biogenetics research promises to hasten the pace of uniform ripening; instead of the almost two decades it took to develop a uniformly-ripening tomato, biogenetics might eventually be able to breed a uniform-ripening trait as needed. Once the process of restructuring plant cells is understood, biogenetics can redesign plants and trees to facilitate machine harvesting. Such redesigning already includes dwarf fruit trees planted close together with branch structures that expedite over-the-row machine harvesting. Biogenetics can also alter the timing of the harvest, while abcission chemicals may be applied to loosen fruit for mechanical harvesting, especially in citrus.

Advances in materials science and electronics promise less bruising and faster sorting. Most California commodities are "overproduced" in the sense that the packinghouse discards 10 to 30 percent of the tree fruit and citrus that arrives from the field. Portable electronic sorting devices on mechanical harvesters could separate acceptable and unacceptable in the field, saving the cost of transporting and sorting in a packing shed.

Thus, biogenetics and electronics advances promise to eventually reshape production and reduce the demand for farmworkers. However, the diffusion of such new harvest technologies will initially increase the demand for labor to

plant new types of trees, change trellising, and install new equipment. More labor may be needed in preharvest activities, such as pruning, and less labor to harvest and sort.

Changes in the number and type of farm jobs may be accompanied by changes in work force composition. In the 1980s, it is already clear that there will be more women in harvest agriculture, fewer jobs in irrigation, and a higher proportion of regular jobs for farmworkers.

Field-packing vegetables and melons has increased the proportion of women in harvest jobs. Field-packing involves a packing platform moving through the field, eliminating heavy bags (melons) or piecerate crews (broccoli). Since the speed of the machine regulates the pace of work, the wage system often changes from a piecerate to an hourly wage. While a piecerate crew tends to eliminate workers who cannot work fast enough, the hourly wage system permits women and older men to work. In some instances, field-packing simply moves "nonfarm" packing shed jobs into the field, and since most packing shed jobs are held by women, this increases the role of women in the farm work force.

Field-packing is a simple intermediate technology whose adoption is encouraged by packing wages that are often double fieldworker wages and the development of portable cooling devices to use in the field. In the San Joaquin melon harvest, for example, the $4.50 hourly wage paid to field-packing crews is considerably less than the hourly earnings of packing shed workers or piecerate harvest crews. Because field-packing is slower, large growers with investments in packing sheds are reluctant to write off the sheds and buy field-packing equipment. However, many smaller growers are turning to field packing to minimize their wage costs.

Drip irrigation is another labor-saving technology being adopted because of rising water and energy costs. Although irrigation uses about one-sixth of all farm work hours in California, the motivation to switch to drip is a water-saving, not a wage-saving one. After drip is installed, the need for irrigation labor can drop by 35 percent. About 300,000 of the state's 2.2 million acres of orchards and vineyards are now drip irrigated. As drip irrigation spreads, an important career progression will disappear for many older harvest workers, who have traditionally shifted to easier but lower wage irrigator jobs in their thirties.

The overall effect of these changes is to increase the proportion of regular farmworkers in California agriculture. This tendency to hire fewer workers for longer periods of employment on one farm is most pronounced in vegetables, where large companies often keep the same workers employed for six to nine months.

Summary

Hired workers do about 75 percent of California's farm work. Regular workers are employed on the same farm for six months or more; their number has been rising as many farms hire fewer workers for longer periods. Seasonal workers are concentrated in crops with two to eight-week peak labor demands, such as grapes and tree fruits.

Since 1950, mechanization has reduced the demand for farmworkers in some commodities, but fruit and vegetable production simultaneously expanded, resulting in a stable overall demand for labor. Average annual farmworker employment is about 220,000, based on EDD's monthly estimates. Total workforce data, which counts the number of persons earning farm wages sometime

during the year, report that there are 620,000 farmworkers--2.8 workers per year-long equivalent job. The total hours of labor needed to produce all fruits and vegetables declined slightly since 1950, and in the mid-1970s three commodities--grapes, oranges, and peaches--required 40 percent of all the fruit and vegetable hours.

Will expansion continue to offset mechanization in the 1990s? California farmers pay higher wages and face higher production and transportation costs than producers in other states and countries, but California farmers also obtain higher yields and better quality than most other production areas. However, increased competition from other areas may eventually reduce the number of farm jobs in California. Biogenetics and electronics advances could expedite the once-over machine harvesting of many fruits and vegetables. Such technologies should initially increase and then decrease the demand for farmworkers. Intermediate technologies, especially fieldpacking, are already increasing the proportion of women and regular workers in the farm workforce while drip irrigation is eliminating jobs.

Farmworker Characteristics and Earnings

Farm work is done by farmers, their unpaid family members, and hired workers. In California, the farmers and family members do about 25 percent of the state's farm work; most are white. The hired workers who do the remaining 75 percent of the state's farm work are younger than their employers and nonwhite. Most farmworkers do only a few weeks of farm work each year, so the 25 to 30 percent who are employed more than eight months do three-fourths of the work contributed by hired workers. California's farmworkers have relatively high hourly wages (average $5) but low annual wages ($3,000 to $5,000). Migrancy is still common but reduced by the availability of more regular jobs, unemployment insurance, and the settlement of farmworker families.

Farm labor data are inadequate, but all sources support a similar farmworker profile: Young nonwhite workers are paid relatively high hourly wages but have low annual earnings because of seasonal unemployment. This section reviews the profiles of farmworkers painted by federal data and two California surveys.

Federal Data

The federal government conducts two household surveys which generate information on the characteristics and earnings of farmworkers. First, the Census of Population asks a sample of households about the occupations of family members during the last week in March. In March 1980, 1.33 million persons in the United States were classified as "farmworkers and related occupations." Seventy percent of these hired workers were white; 17 percent, Hispanic; 10 percent, black; and 3 percent, Asian or other. In California,

the census recorded 238,000 farmworkers, almost 18 percent of the nation's total. Fifty-three percent of California's farm work force was Hispanic; 30 percent, white; and 17 percent, Asian or black. The "related occupations" in the census include nursery workers, nonfarm groundskeepers and gardners, nonfarm animal caretakers, and graders and sorters of agricultural products.

The decennial Census of Population is a basic source of data on worker characteristics, but the information is only about those who were doing farm work in March. Such a survey misses workers who were employed in other months but not in March, that is, nearly two-thirds of U.S. farmworkers may be missed by this count. Furthermore, the farmworkers employed in March are different from workers employed only in the summer and fall. March farmworkers tend to be older whites employed in regular jobs and dependent on farm work for almost all of their incomes.

The second federal source of farmworker characteristics and earnings data is a household survey conducted for USDA every other December. The USDA's Hired Farm Working Force (HFWF) report is based on responses to questions attached to the regular Current Population Survey of 59,000 households that generates monthly employment information. In December 1983, about 1,500 households reported that someone did farm work for wages in 1983, including about 180 households in California. Responses from these sample households are then expanded to estimate the number, distribution, an characteristics of all farmworkers. December is also a poor month to survey farmworkers because many are out of the United States, those working at that time are not distributed randomly across the United States, and the survey is based on the assumption that each U.S. housing unit has an equal probability of inclusion, an assumption that may not apply to farmworker housing.

The 1983 HFWF survey estimated that about 2.5 million persons 14 and older did farm work for wages sometime during 1983. Seventy-three percent of these hired farmworkers were white, 13 percent black, and 12 percent Hispanic. Over half were under age 25 (including 11 percent aged 14 and 15). Farmworkers earned an average $3,138 for 100 days of farm work, or an average daily wage of $31 or $3.90 per hour for an eight-hour day. Most farmworkers work only a relatively few number of hours in the nation's agriculture; the one-sixth of all farmworkers employed 250 days or more in agriculture contributed one-half of the hours of work done by farmworkers.

About 9 percent of the farmworkers interviewed in December were migrants, i.e., workers who crossed country lines and stayed away from home overnight to do farmwork for wages. Most interviewed migrants were white (45 percent) or black (39 percent), and 35 percent were under age 25. Migrants averaged $4,638 for 124 days of farm work, $37 daily, or $4.66 hourly for an eight-hour day.

The HFWF does not provide state-level detail; rather, California is grouped with Washington, Oregon, Alaska, and Hawaii in the Pacific farm production region, a region with an estimated 534,000 farmworkers and 55,000 migrants in 1983. Forty-five percent of these Pacific region workers were white; and 45 percent, Hispanic. Pacific region workers averaged $4,847 for 123 days of farm work, i.e., $39 daily or $4.91 hourly for eight-hour days.

The USDA acknowledges that its HFWF survey misses farmworkers, and it suggests that many of those missed are illegal alien workers who avoid interviewers or leave the United States in December. No alternative survey is available, but the HFWF survey is widely believed to be much better at

locating students and women in the midwestern and southeastern states than in interviewing California's Hispanic farmworkers. Indeed, the contrast between state surveys and the HFWF data reinforces this notion.

The University of California, Davis - Employment Development Department (UCD-EDD) Survey

The unsatisfactory nature of both census and HFWF data prompted an August 1983 survey of 1,286 farmworker households in California. The purposes of this statewide survey were to determine farmworker characteristics and earn-ings and to ascertain how immigration reform might affect farmworkers and farmers. Samples of 30 worker households were drawn from the areas surrounding each of EDD's 43 farmworker offices. These samples were constructed to reflect the approximate distribution of different kinds of workers, so that irrigators, pruners, equipment operators, and harvest workers were interviewed in proportion to their estimated shares of the local work force.

Details of the The UCD-EDD survey are reported in Mines and Martin, 1986. The survey yielded three major findings. First, over 80 percent of California's farmworkers are immigrants--persons born abroad who first enter the United States between the ages of 18 and 30. Second, average hourly wages and piecerate earnings were $5.12 or $182 weekly. However, the average farmworker worked only 23 weeks, so farm earnings averaged only $4,200 a year. Third, the harvest labor market operates in a peculiar revolving door fashion. Farmworkers earn the highest piecerate harvesting wages when they are young and strong, but after a decade of of harvesting, most shift to physically less demanding farm jobs, find nonfarm jobs, or return to Mexico.

California's immigrant work force is in a constant state of flux; new workers are recruited continuously to replace those who leave agriculture. Unlike other industries with stable overall employment, the farm work force does not age because 18 to 30 year-old immigrants replace the 30 to 40 year-olds who retire from the harvest work force.

The UCD-EDD survey recorded the place of birth but not the race of the farmworkers interviewed. Almost three-fourths of the sample were born in Mexico, 7 percent in other nations such as the Phillipines, and 20 percent in the United States. Since many of those born in the United States were Mexican-Americans, over 90 percent of the sample was nonwhite. Interviewers attempted to ascertain the legal status of 1,000 workers interviewed. Although no documentation was requested or verified by interviewers, 54 percent of the respondents said they were immigrants with greencards which permit them to live and work legally in the United States; 22 percent claimed to be U.S. citizens; and 24 percent were illegal aliens. Three-fourths of the sample asserted legal immigrant or citizen status, although interviewers did not verify workers' claims.

Farmworkers interviewed in August 1983 were earning an average $5.12 hourly or $182 weekly for 35.5 hours or work. Interviewed workers averaged 22 weeks of work annually, generating average annual earnings of $4,000. However, there were substantial differences by sex: Men averaged $5.29 hourly, $190 for a 36 hour week and $4,723 for 25 weeks of farm work, while women averaged $4.59 hourly, $165 for a 36 hour week and $2,710 for 16 weeks of farm work. Thus, men averaged about $2,000 more than women.

Almost 40 percent of the UCD-EDD sample workers were migrants who fell into two groups: Those who follow-the-crops within Caliifornia and those who

left their normal residence in Mexico to do farm work in California. Of the 860 migrants in the sample, 53 percent followed-the-crops; 64 percent went back-and-forth across the border; 16 percent did both. Sixty percent of the 2,333 farmworkers whose employment patterns were established by the survey did not migrate.

Almost half of the sample was in the San Joaquin Valley (Figure 2). The region with the highest percentage of workers earning piecerate wages (South Coast) also had the highest average piecerate earnings ($8.64). There were 164 farmworker four-member families in the sample, earning an average of $175 weekly or $8,300 annually for 47.3 combined family work weeks. Two-thirds of the 1,286 households surveyed included at least one person who received unemployment insurance and almost three-fourths owned a car or truck.

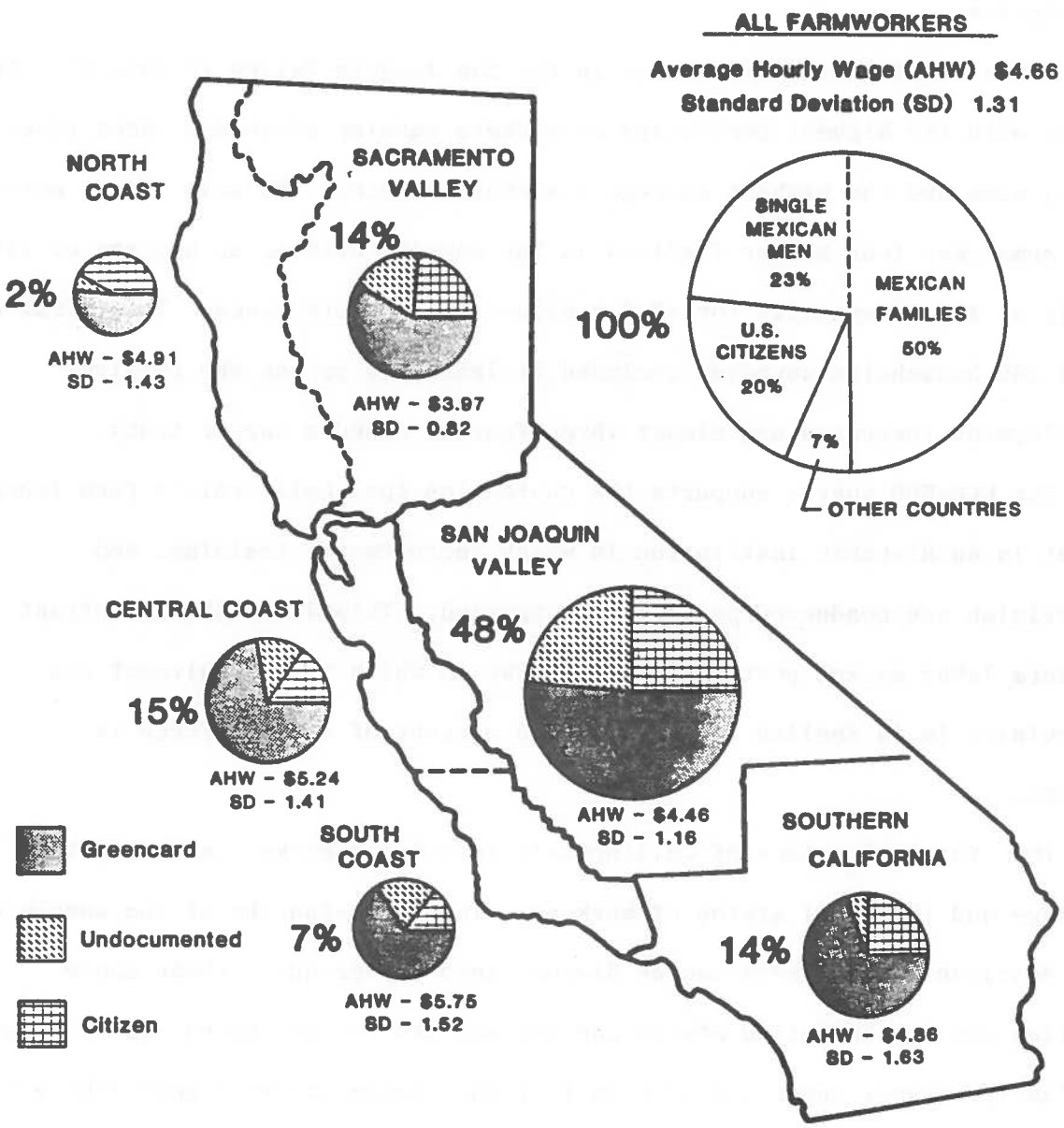
The UCD-EDD survey supports the contention that California's farm labor market is an Hispanic institution in which recruitment, training, and supervision are conducted primarily in Spanish. This is in sharp contrast to the farm labor market portrayed by the HFWF in which the recruitment and supervision is in English because only 13 percent of the workforce is Hispanic.

The "foreign" nature of California's farm labor market is due to the language and the legal status of workers. The three-fourths of the sample who were Mexcican-born workers can be divided into two groups: those whose families are in the United States and men who are in the United States alone. The family workers comprised over half of the sample and were more likely to have greencards and U.S.-born children.

The single Mexican men made up one-fourth of the sample; one-third of these workers were married but left their families in Mexico. Over half of

FIGURE 2

CALIFORNIA FARMWORKERS
Percentage Distribution



these single men were illegal aliens. If past patterns continue, some of these single men will eventually settle in the United States with their families.

The UCD-EDD survey, conducted in August 1983, near the peak harvest season, found a work force which is more female and more seasonal than the HFWF reported (Table 13). Women made up one-third of the UCD-EDD sample, and although men outnumber women in the 20 and 29 and the 40 and older age groups, the sample was equally divided between men and women in the 30 to 39 age group.

The HFWF reported that 209,000 Pacific region workers (39 percent) did 25 to 149 days of farm work in 1983. The UCD-EDD sample found that two-thirds of the farmworkers were seasonal workers. The HFWF reported that 69 percent of Pacific region workers did only farm work in 1983, versus 79 percent in the UCD-EDD survey.

Worker characteristics by activity can be analyzed with the UCD-EDD survey data. Hand-harvesting accounted for 40 percent of the primary jobs of interviewed workers (Table 14), followed by thinning and hoeing (13 percent) and pruning (12 percent). Males did a greater share of the irrigation, equipment operation, and supervision, while women did most of the sorting and half of the thinning and hoeing. Mexican-born workers (three-fourths of the sample) did a greater share of the supervision and irrigation but less than three-fourths of the sorting and pruning.

Illegal alien workers were concentrated in hand-harvesting and irrigation. Fifty-four percent of the citrus harvesters were illegal aliens, 44 percent of the fruit thinners, and 36 percent of the grape harvesters. Generally, commodities such as citrus, tree fruits, melons, and some piecerate

Table 13. Farmworker Characteristics and Earnings

	HFWF (1981)	UCD-EDD (1983)
Sample Size (workers)	208	2,239
Hispanic (percent)	49	85[a]
Male (percent)	76	66
Farmwork (average weeks)	27	22
Distribution (percent)		
--25 days or less	22	8
--25-149 days	35	61
--150 or more	43	31

[a]Percent born in Mexico plus the estimated number of California and Texas-born Hispanics

Sources: U.S. Department of Agriculture, The Hired Farm Working Force of 1981, Washington, D.C., 1983; University of California, Davis-Employment Development Department Survey, 1983.

Table 14. Farmworker Characteristics by Major Activity

Characteristic	Activity								
	Hand Harvest	Prune	Thin and Hoe	Sorter	Irrigate	Equipment Operator	Foreman	Plant and Thin	All Activities
All Workers[a]	867	264	280	217	122	235	29	129	2,143
Percent Distribution	40.5	12.3	13.1	10.1	5.7	11.0	1.4	6.0	100.1
Percent Male	64.1	67.4	51.8	44.2	93.4	91.9	86.2	64.3	65.9
Percent Adults	82.7	86.1	81.1	80.2	86.8	96.5	100.0	79.7	84.7
Percent Mexican-born	78.3	67.9	71.9	64.2	80.5	61.7	89.7	72.1	72.9
Percent Illegal[b]	29.0	27.9	24.5	12.8	32.0	12.5	16.7	27.4	24.6
Percent Greencard	55.1	51.4	54.5	64.0	48.6	45.1	83.3	47.1	53.9
Average Hourly Wage	4.75	4.37	4.38	4.40	4.47	4.92	5.42	4.57	4.66
Standard Deviation	1.45	0.79	1.73	1.15	1.07	1.17	2.61	1.05	1.36
Number of Workers	211	59	95	111	78	139	42	25	774

[a]Workers who reported their primary activity in 1982-83.

[b]Includes about 5 percent illegal workers who have a pending status because, e.g., they are illegal but have applied for legal status. Illegal plus greencarders plus U.S. citizens equal 100 percent.

Source: University of California, Davis-Employment Development Department Survey, 1983.

vegetables that depend on young men for hand-harvesting are most dependent on illegals. In contrast, field-packed commodities such as broccoli, strawberries, and carrots attract more women and older men, the farmworkers who are most likely to have greencards. There is a weak correlation between low wages and illegals: Nonharvest activities with an above average percent of illegals (irrigators, pruners, and thinners) also had below average wages. However, hiring patterns and the nature of the work probably do more to explain the presence of illegals; for example, sorters earn less than irrigators, but are only 13 percent illegal.

In only two activities do U.S. citizens play a significant role. Forty-three percent of the equipment operators and 23 percent of the sorters were U.S. citizens.

During the first seven months of 1983, the farmworkers interviewed did not have many jobs; they averaged just 1.8 jobs each. For example, the average pruner worked as a pruner on only one farm; the average citrus harvester worked for only one employer; and the average equipment operator did not change employers, although workers employed by FLCs could have worked on several farms as a harvester. Most farmworkers reported that their primary job for an employer was hand-harvesting, but many also did second and third jobs for the same employer. This is especially true for irrigators--almost half of the 190 irrigators interviewed reported that irrigation was a second or third task for them behind, e.g., hand-harvesting or pruning.

Most farmworkers earn hourly wages. Only 40 percent of the workers reported that they were paid piecerate wages for at least some jobs. Hourly wage jobs paid an average $4.66, with little variation by type of

worker--migrant men, family immigrants, or U.S. citizens--or by legal status, sex, or place of birth.

Piecerate rates averaged $5.97 hourly, or $42 per day; and about 83 percent of the piecerate jobs were hand-harvesting jobs. Piecerate wages can be based on individual or crew performance. The crew piecerates common in lettuce and melon harvesting yielded the highest hourly wages, followed by the individual piecerates frequently used in citrus, tree fruits, and strawberries. However, these piecerate workers usually do not work as many hours per day as hourly workers, so the wage gap narrows considerably when converted to a daily wage. Individual piecerate earnings are also more variable than hourly wages, so low-productivity piecerate workers may earn less than the average hourly wage.

Piecerate and hourly wages can be combined so that average hourly wages reported by workers in the UCD-EDD survey can be compared to the average wages reported by employers (Table 15). The combined worker-reported wage in 1983 was $5.12; the comparable 1982 employer-reported wage in a statewide survey was $4.85; and the USDA July 1983 Farm Labor reported an average hourly wage of $4.85. All these reports indicate that average hourly wages are about $5.00.

Wages vary considerably by region and activity. Both employers and workers report that wages in California's coastal regions are 20 to 40 percent above the statewide average, while Central Valley wages are 8 to 20 percent lower. Within each region there is considerable variation in wages: The standard deviation of $3.32 around the South Coast average wage of $7.26 means that two-thirds of the wages fall between $3.94 and $10.58. In contrast, most San Joaquin wages are closer to $4.60 average: Two-thirds of all San Joaquin

Table 15. California Farm Wages: 1982-84

Survey	Region						
	Southern California	South Coast	Central Coast	San Joaquin	Sacramento	North Coast	California
UCD-EDD ($/hour)	5.71	7.26	6.17	4.60	4.15	4.93	5.12
Standard deviation	3.43	3.32	3.32	1.93	1.13	1.41	2.61
Percent above/below average	11.5	41.8	20.5	-10.2	-18.5	-3.8	--
Workers interviewed	136	74	138	538	93	26	1,071
Employer Survey ($/hour)	4.47	6.42	6.78	4.48	4.48	5.23	4.85
Standard deviation	1.03	2.19	2.78	1.01	0.73	1.40	1.71
Percent above/below average	-7.8	32.5	39.8	-7.6	-7.6	7.8	--
Farms responding	70	40	56	463	45	15	711

California Average Wages ($/hour)

	Fieldworkers	Livestock	Supervisory	Other	Hourly	Piecerate	Other	Workers
July 1982	4.69	4.72	6.61	5.09	4.48	6.20	5.61	240,000
July 1983	4.55	4.98	7.00	5.44	4.58	6.20	6.00	257,000
July 1984	4.88	4.87	6.90	5.47	4.83	6.79	6.07	206,000

California FLC Wages ($/hour)

	Average	Hourly	Piecerates	Fieldworkers	Workers
July 1982	4.99	4.43	6.00	4.56	58,000
July 1983	5.39	4.70	6.20	4.50	65,000
July 1984	6.14	5.41	6.60	5.05	75,000

Sources: University of California, Davis-Employment Development Department Survey, 1983; G. Johnston, and P. Martin, "Employment and Wages Reported by California Farmers," Monthly Labor Review, September 1983; U.S. Department of Agriculture, Statistical Reporting Service, Farm Labor, 1982, 1983, and 1984.

wages are between $2.67 and $6.53. The minimum wage recorded in the survey was $3.00. Generally, the higher wages recorded in both employer and worker surveys are associated with more variation in wage rates.

Average hourly wages in the UCD-EDD survey varied from about $4.40 for sorting, thinning, and pruning to $4.75 for hand-harvesting and $4.92 for operating equipment. The overall average wage is $4.66, with a standard deviation of $1.36, implying that two-thirds of the wages are between $3.30 and $6.02. The averages for foremen, thinners, and hand-harvesters had an especially high variance.

Union status and type of employer also influence wages. Workers represented by unions earned 24 percent more than average in the UCD-EDD Survey, $5.54 versus $4.46. Workers employed directly by a grower averaged almost $10 per day more than workers hired through FLCs: $47.70 versus $38.60.

The UCD-EDD survey had to rely on worker memories to record past jobs and wages, as all recall surveys must. The UCD-EDD asked workers what they did during each of the previous 52 weeks. The four possible labor market statuses were: employed in agriculture, employed in nonfarm jobs, unemployed, and out of the U.S. work force because, e.g., of being in Mexico.

Adult farmworkers averaged 23 weeks of farm work and two weeks of nonfarm work. Farmwork yielded $186 weekly and nonfarm work $160 weekly, for annual earnings of $4,620. Single men worked an average 28 weeks, were unemployed 15 weeks, and were out of the United States nine weeks. Mexican-born heads of California families worked an average 26 weeks, were unemployed 23 weeks, and spent three weeks out of the United States. In addition to earnings, two-thirds of the farmworkers obtained UI payments and one-fourth received food

stamps or MediCal benefits. The dollar amount of social service benefits was not reported; but if a farmworker received maximum UI benefits, total income would be about $7,500--roughly $5,000 in earnings and $2,500 from UI.

Looking at farmworker classification by household size distribution: One-third were in the United States alone; one-third lived with families of five or more. Farmworker families typically had two working adults and at least one teenage worker, although spouses and teenagers typically worked only eight to 15 weeks annually. As the number of workers in a household increased from one to two, weeks worked increased from 25 to 40 and household earnings rose by $2,700.

One-fifth of all workers sampled returned to Mexico annually, but Mexico provided almost no income for them. Only one-eighth of the Mexican-born farmworkers with families in California had one or more persons who worked in Mexico in recent years, and only one in 25 had a family member who worked in Mexico five or more months. Thus, California's farmworkers are primarily Mexican-born workers who work only in the United States.

The UCD-EDD survey also asked farmworkers about their assets. Over 19 percent of the sample households owned a home in the United States, 29 percent owned a home in Mexico, and 4 percent owned homes in both countries. Almost three-fourths of the households owned a car or truck, and 41 percent had a U.S. or foreign bank account. As expected, men in the United States without their families were most likely to own houses in their home country (50 percent), own farmland in Mexico (17 percent), and have a Mexican bank account (29 percent).

The UCD-EDD survey indicated that most farmworkers live in houses rented from private landlords. Over 62 percent of the farmworkers interviewed lived

in houses, 18 percent in apartments, and the rest in house trailers, boarding rooms, or on-farm barracks. The average rent for three-room quarters was $230 per month, paid to private landlords (46 percent), public agencies (20 percent), and employers (17 percent) or friends (17 percent).

When farmworkers were asked about their needs, most cited short-run problems such as help filling out government forms (54 percent) and assistance in finding jobs (54 percent). Other needed services were transportation (30 percent), help communicating with doctors (30 percent), child care (16 percent), English classes (14 percent), and immigration assistance (14 percent). Farmworkers tend to rely on friends and relatives to meet these service needs.

Farmworker Changes 1966-1983

In 1966, the California Assembly Committee on Agriculture (1969) sponsored a profile of California farmworkers which also relied on EDD staff to locate and interview workers. Several major changes in the farm work force appear to have occurred between 1966 and 1983. Mexican farmworker families have settled in rural California, and both husband and wife are now likely to do farm work. There is an increased Mexican presence in the farm work force: The Hispanic share has increased from half to about 90 percent. In 1966, California's farm work force was not yet a "Mexican institution" despite two decades of bracero labor. By 1983, the farm work force had been almost completly "Mexicanized." Signs of this change include the near universal usage of Spanish in the fields and the frequent substitution of Mexican for American holidays.

In 1966, Mexican and Mexican-American farmworkers tended to be single men (either not married or married with families in Mexico) who lived in on-farm labor camps. These workers often followed the crop harvests from south to north, and many left the United States each winter. In 1983 most farmworkers are settled in rural California; these farmworker families tend to provide two adult workers and sometimes a teenager to the farm work force. By 1983, the farm work force included more 20 to 54 year old workers and fewer very young workers.

Migration has decreased as families replaced single men. Families do not migrate as much as the single men of the 1960s for several reasons. The cost of migration increased and temporary rural housing disappeared while the formal job referral system decayed, making it harder to find farm jobs in other areas. Families tend to remain in one location for their children's education and because social service programs are available. There is, of course, still a great deal of farmworker migration, but the settlement of Mexican farmworker families in California has reduced it considerably.

The "Mexicanization" of the farm work force is the predictable outcome of a flow-through labor market that attracts primarily immigrant workers. As the whites, blacks, and Asians who comprised more than half the 1966 work force left agriculture, they were replaced by Mexican immigrants. The children of the 1960s farmworkers did not tend to stay in farm work. Similarly today's farmworkers' children often do farm work as teenagers, but most go on to do nonfarm work. Most of the replacement workers who enter the harvest workforce for 10 years or so are born in rural Mexico.

The "Mexicanization" of the farm work force has reduced the average educational level of farmworkers and changed the nature of farmworker

recruitment. As local students and U.S. women doing seasonal farmwork were replaced by immigrants from rural Mexico, the statistical average years of schooling of farmworkers decreased. As Mexicans became the core group of farmworkers, the recruitment system changed from primarily an open system involving grower advertising and U.S. Employment Service job matching in English to a more closed system of foremen and labor contractor recruiting in Spanish through workers' social networks. Today, the easiest way to get a farm job is to know someone who is in contact with a foreman or labor contractor who is hiring. Today's recruitment system is closed in the sense that workers who do not speak the "right" language or have the proper contacts do not learn about farm jobs.

Summary

Hired workers do about 75 percent of California's farm work; and a 1983 UCD-EDD survey found that three-fourths of California's farmworkers are born in Mexico and 90 percent are Hispanic. The federal farm labor data which indicate that few farmworkers are Hispanic are misleading: The Census of Population obtains reliable information only on workers employed in March, and the Hired Farm Work Force report is based on a relatively small sample drawn in December, when many farmworkers are out of the United States. Both federal surveys report that less than half of California's farmworkers are Hispanic.

A UCD-EDD survey reported that most of the immigrant farmworkers had greencards, through the validity of their claims was not established. Farmworkers averaged $5.12 hourly, and adult farmworkers averaged $182 weekly for 23 weeks, for annual farm earnings of $4,200. About one-third of

farmworker households tend to be one person units at one extreme; another one-third is from large units with five or more persons, at the other extreme. Larger farmworker households usually have several workers and also obtain social service assistance. However, most farmworkers are unemployed about as many weeks as they work, keeping annual incomes low.

The major change in the farm work force since the mid-1960s is the growing importance of Mexican-born workers. These workers usually enter the United States between the ages of 18 and 30, do harvest work for about 10 years, and then find easier farm jobs, nonfarm work in the United States, or return to Mexico. Obtaining a U.S. job and making the transition from harvest to other work are governed largely by social networks that transmit job information and provide loans, housing, and training assistance.

The Farm Labor Market

California's farm labor market matches 400,000 to 500,000 seasonal workers with jobs each year. For many farmers, an entire year's farm income depends on harvesting a perishable commodity during a critical period. Most farmworkers, who find work for only 20 to 30 weeks each year, scramble to maximize their earnings during the harvest period by finding the highest hourly or piecerate wages. Most farmworkers lack certifiable skills, so many employers hire everyone who wants to work. The general scramble for jobs that last a week or two is considered a classic unstructured labor market.

An unstructured labor market contains an inherent conflict of interest between workers and employers. Workers prefer labor shortages to force wages up while employers prefer a surplus of workers to minimize wages and avoid crop losses. An unstructured labor market with few commitments between workers and employers constantly grapples with these conflicting interests.

California's farm labor market has experienced periods of varying amounts of structure. The 1930s fit the classic case of little structure: Workers came to California desperate for jobs; some employers advertised one wage, only to cut it when too many workers appeared. The 1940s and 1950s witnessed more structure, in part because the bracero program required employers to plan their labor needs and offer braceros (but not Americans) work contracts which guaranteed wages during three-fourths of the contract period. Until the mid-1960s, the farm labor market was relatively homogeneous in the sense that there were fewer differences in employment conditions between commodities or regions than exist today.

After the bracero program ended in 1964, farm labor markets began to diverge. Some employers hired personnel managers to improve employment practices so that fewer workers could be employed but for a longer time; this work force stabilization required the development of a continuous relationship between workers and an employer. Some large employers responded to union pressures by developing seniority lists so that workers would know when they were likely to be called back. Most farm employers in the 1970s began to offer workers a package of fringe benefits that included off-the-job health insurance, but some of these plans had eligibility provisions that restricted seasonal workers' access to benefits.

Farm labor markets are far more structured in the 1980s than in the past. Except in a few isolated unstructured labor markets, where workers still "show-up" every morning and hope to be selected for work, most farmworkers have a contact person who tells them where and when to report; this contact may be a labor contractor, a supervisor, or a friend or relative already employed. Most workers know the wage before reporting, and many workers brought into crews by friends and relatives are trained by them. Instead of just waiting or driving around looking for jobs, most farmworkers maintain mail or telephone contact with past or potential employers.

Every labor market has three important elements: recruitment and training, compensation and supervision, and retention or career loyalty. California's farm labor market has evolved with considerable variation in each of these elements. Some employers have written application forms, but most do not. Most employers pay hourly wages and use supervisors to maintain the work pace, while others offer piecerates and monitor only product quality. Some

employers maintain seniority lists and offer pensions and other benefits to encourage workers to return, while others simply hire whatever workers are available when needed, expecting others to be available next season.

This section summarizes the many different labor markets that operate in California agriculture. Instead of a single labor market, there are many micro labor markets, each peculiar to a particular commodity and area. Generalizations allow distinct labor market patterns to emerge.

Recruitment and Training

Most recruitment is handled by foremen or farm labor contractors (FLCs). Because most farm employers do not speak Spanish, they employ a bilingual foreman or FLC to recruit farmworkers. On smaller operations, these "foremen" also tend to be semi-permanent irrigators or equipment operators, depending on the season. On larger farms, foremen tend to specialize in recruiting and supervising workers.

A general rule is that the less specialized the foreman, the less structured is the labor market. For example, a large employer with 10 or more crews of 30 workers will usually have 10 full-time foremen who transport workers, orient new hires, monitor the work pace and work quality. In these relatively structured labor markets, some of the foreman's duties are turned over to a personnel department which handles recruitment and benefits and arbitrates complaints. Workers in structured labor markets tend to settle in the area and arrange their own housing, transportation, and social services.

Foremen have more duties in semi-structured labor markets, where they not only recruit workers, but also arrange housing, transportation, and social services. A foreman may have complete discretion to hire and discipline

workers; many also have discretion to deal with emergencies such as cash advances and illnesses. Employers may not know the actual terms and conditions of employment, since workers have no way to complain directly to the employer, for example, about overcharges for equipment or transportation. Foremen tend to be selected for their ability to recruit workers, not for their probity and integrity.

Since farm employment is concentrated on large farms, foremen are being subjected to more written rules and procedures. More employers are establishing mechanisms for worker complaints that are independent of foremen. Supervisor training, employee handbooks, and grievance mechanisms are spreading. However, many employers resist policies which reduce their flexibility in hiring and firing workers.

The tension between worker rights and flexibility in personnel policies will likely continue in the years ahead. Most farm organizations have educated their members about the obligations imposed on farm employers by the Migrant and Seasonal Worker Protection Act (MSPA) of 1983. MSPA requires full disclosure of wages and working conditions before hiring and written wage records that include each worker's hours of production, the applicable wage or piecerate, and any deductions. MSPA and other labor laws have promoted more structured labor markets, but many foremen still have considerable discretion over farm workers.

Foremen are the key intermediaries in farm labor markets, whether employed by farmers, packing houses, employer associations, or FLCs. The key asset of most foremen is their access to a migration network which can supply workers. Such access permits them to tap the labor supply of U.S. farmworker

communities and Mexican villages. This network-foremen dependency is two-sided: The network needs access to jobs, and foremen need access to workers.

Migration networks are selective in the sense that they include friends and relatives and usually exclude non-Spanish speaking workers who might be seeking farm jobs. Foremen who depend on established networks for new workers make it hard for new groups of workers to "break into" agriculture. There are established Filipino and Punjabi networks employed on farms, but new Asian refugees have had to develop bilingual foremen and establish networks of workers to gain access to farm jobs.

The U.S. Employment Service and union hiring halls also match workers and jobs, but these institutions are only minor compared to the foreman-network system. If the approximately 450,000 seasonal farmworkers average 1.8 jobs each, then there are 810,000 job matches annually. The Employment Service made only 28,000 agricultural referrals in 1984, some to foremen and FLCs and some directly to dairy, livestock, and equipment employers. Union hiring halls operate most prominently in the Central Coast vegetable district. In September 1983, the UFW reported that its 10 hiring halls had 1,000 registered workers available for work.

Compensation and Supervision

Most seasonal fieldworkers are deployed in crews of 20 to 40 workers. Most differences in supervision can be traced to the type of wage system: individual piecerate, crew piecerate, or hourly wage. An employer who records each worker's accomplishments and pays a piecerate wage is the most likely to have diverse work crews whose daily earnings vary widely. An employer who

lets the entire crew divide a piecerate wage will usually have a crew of young strong men since the crew itself drives out workers who cannot maintain a fast pace. An employer who pays hourly wages often will attract crews of men and/or female workers who tend to do more careful work at a slower pace. Some employers offer an hourly wage and a bonus if the individual or crew surpasses a target level of accomplishment.

There are two major farm wage systems: the hourly wage system and the piecerate wage system. Hourly wages are more common when the supply of labor is ample because the employer can select workers of uniform ability from a large labor pool. Piecerate wages encourage rapid work that requires quality checks; hourly wages encourage a slower pace that requires crew pushers to speed up the work. Employers prefer hourly wages if they can select workers from a vast pool, as during the bracero program, but employers adopt piecerate wage systems when a diverse group of workers is to be employed. Piecerate wages keep harvest costs constant regardless of worker characteristics. Hourly wages, on the other hand, stabilize worker earnings and cause harvesting costs to vary with worker characteristics. A hybrid piecerate is used in parts of the citrus industry in an attempt to stabilize worker earnings. The citrus piecerate is varied with objective indicators of worker productivity, such as tree height, fruit size, and yield.

Hourly wages are paid in 60 to 70 percent of the farm jobs, including harvesting, thinning, hoeing and sorting, irrigation, and operating equipment. Generally hourly wages are paid when the quality of work is relatively easy to supervise (thin and hoe), when harvest workers are of approximately equal productivity, and early or late in the season when the prevailing piecerate does not yield "enough" earnings.

Most harvest crews work for six to eight hours daily. Generally, the starting time and the length of the work day depend on arrangements for packing or processing the commodity. A packing or processing facility establishes a schedule to accept a harvested commodity, and the grower or manager then informs foremen where and how much to harvest that day. In most instances, harvesting schedules depend on the maturity of the commodity and the capacity of the packing or processing plant, although some of the largest producers of fresh fruits and vegetables make their harvesting schedules contingent on how much preharvested lettuce or citrus has been sold to supermarkets.

Most hand-harvested commodities are packed into bags or buckets and then dumped into bins that must be hauled from the field or orchard. Worker frustrations arise when bad weather, poor markets, or transportation or processing bottlenecks force workers to stop harvesting, for when the work stops, the pay stops. Workers not only incur ordinary living expenses during these unpredictable "down days," but also tend to spend more money. A few employers provide standby pay or pay workers who report for a minimum number of hours even if no work is available, but in most cases workers are paid only when they actually work.

Seasonal workers who live on or near the employer's property are the ideal flexible work force for an employer: Little advance planning is necessary to secure a workforce. The employer simply determines if there is work to be done and then calls out the crew. In the extreme case of workers available seven days a week for up to 12 to 14 hours if necessary, the potential work week may be as much as 100 hours--but the paid work week only

25 to 45 hours. This day-to-day and week-to-week variance in hours and earnings encourages many workers to leave harvest work.

Harvesting requires more workers than any other farm task. Most entry-level farmworkers begin as harvesters. Harvest wages are typically higher than those paid for jobs such as irrigating, thinning, or pruning. The harvest labor market has the peculiar characteristic that young entry-level workers earn higher-than-average wages, while older workers in nonharvest jobs tend to work more hours at lower wages. Women and older workers do some harvesting, but most of it is too arduous. Most harvest workers "last" for less than 10 years and are then replaced by younger workers. As workers age, they move into less physically demanding farm jobs, find nonfarm jobs, or leave the United States.

Farmworker Careers

Labor-intensive agriculture offers few career farmworker jobs. Instead, it offers easy entry seasonal jobs. Students, women, and temporarily unemployed persons filled these jobs to supplement their incomes in the past. For Americans, seasonal farm work has always been a last resort job, not a career. This explains why the harvest labor market has been considered a "salvage labor market," a place to convert time that would otherwise not be compensated, into earnings.

There has been no consistent pressure on agriculture to convert last resort seasonal jobs into career positions by, for example, experimenting with improvements in employment practices and by encouraging mechanization, crop diversification, and mechanical harvesting aids. Periods of farm labor shortages (such as 1965-66) have always been followed by the ready

availability of immigrant workers. These immigrant workers have few wage complaints when their hourly U.S. earnings exceed the daily wage at home. Farmers maintain that Americans won't do harvest work. Decades of foreign workers have encouraged most American workers with other options to abandon seasonal harvest work in California.

No one knows exactly what wage, working condition, and management changes would be required to develop acceptable farmworker career jobs because immigrant workers have usually been available. There are, however, several examples of career farmworker positions. A few farm employers have made harvest jobs attractive to U.S. citizens and legal immigrants by adopting relatively simple personnel practices such as seniority recall to increase the certainty of reemployment, standby pay to reduce the inherent frustration of unpredictable weather and processor schedules, and fringe benefits such as off-the-job health insurance and pension plans to encourage some workers with other options to stay longer in harvest work. However, these policies to select and stabilize the best harvest workers have also encouraged unionization and wage increases.

The harvest labor market of the 1980s is fracturing into two distinct segments. One kind of market results when farmers restructure their harvest jobs to employ fewer workers for longer periods. These jobs attract U.S. citizens and legal immigrants who earn $6 to $10 hourly or $6,000 to $8,000 annually for 20 to 30 weeks of work. A farmworker family with two working members who also obtain UI benefits during the off season can have a total income of $10,000 to $20,000. The work is physically hard, but this type of stable labor market resembles that for seasonal construction workers and comes closest to offering workers career positions. However, these stable

harvest labor markets are the exception. They are confined largely to long-season vegetables and citrus farms and nurseries that employ workers for six to eight months.

The other type of market is more common. The farmer who needs harvest workers for only two to four weeks and relies on a foreman or labor contractor to recruit and supervise the crew. For these employers, changes in employment practices might increase their labor costs. This majority of employers strongly resist proposals that might reduce the supply of labor, and advocate agriculture's traditional position that enough workers should be available so that crops are not lost for lack of labor.

Why and how have a few harvest labor markets been elevated into the virtuous circle of higher-than-average wages, productive workers, fringe benefits, and employment practices that promote career attachment? Most harvest labor markets seem trapped in a vicious circle of lower wages, recently immigrated workers, and poor working conditions. Virtuous labor markets need not increase food prices. They do, however, tend to be found most often on larger farms that hire enough workers to invest in better personnel policies.

Summary

The harvest labor market has changed from an easy-entry seasonal job for students and women to a longer-season dependence on adult immigrants. Most of these immigrant workers are matched with farm jobs by foremen or labor contractors who recruit through networks of friends and relatives thereby excluding workers without ties to these recruitment networks.

Wage and working conditions vary with the wage system. Piecerate wages encourage workers to harvest commodities quickly, keeping the employer's harvest cost constant regardless of worker characteristics. Hourly wages standardize worker earnings but permit harvest costs to vary with worker characteristics. Most employers prefer piecerate wages unless they can select workers of uniform ability from a large labor pool.

Few Americans want to be farmworkers. Farm work is typically a temporary or last-resort career for workers who are excluded from other labor markets. The few nonimmigrants who do farm work in California are usually considered "inferior" to immigrant workers whose frame of reference is wages and working conditions in a developing country. Thus, most employers prefer immigrant workers.

Issues and Alternatives: Unions, Migrancy, Housing, and Immigration Reform

This section discusses four farm labor issues: unions, migrancy, housing, and immigration reform.

Unions

Unions have contracts with only about 1 percent of California's farm employers. A recent survey indicated that seven unions represent 80,000 to 90,000 farmworkers sometime during the year. These unions won elections on 645 farms, and these election victories produced 408 contracts which covered about 30,000 farm jobs. If the 80,000 to 90,000 union members are compared to the total farm work force of 620,000, then about one-seventh of California's farmworkers are union members. Similarly, the 30,000 farm jobs can be compared to the average 220,000 jobs for hired workers, also indicating that about one-seventh of the state's farm jobs are covered by union contracts.

The United Farm Workers (UFW) has the most members and the most farm jobs covered by union contracts, but the Christian Labor Association (CLA) has almost twice as many contracts as the UFW. The CLA and Teamsters Local 63 together have 235 contracts with southern California dairies. These dairy contracts, which cover an average four farm jobs, account for almost three-fifths of all union contracts.

The UFW has two-thirds of the 173 fieldworker contracts throughout the state. The UFW reported in 1984 that it had 40 contracts in grapes and tree fruits, 36 in horticultural specialities such as nurseries and mushrooms, 22 in vegetables, and 17 in citrus. These contracts include those on farms which

have had decertification votes or where contracts have expired if the UFW has alleged improper voting or unlawful bargaining.

Teamsters 890 has three Salinas-area contracts, but its major contract is with Bud Antle. The Salinas-based Independent Union of Agricultural Workers (IUAW) has 11 contracts covering about 1,200 jobs, and the Santa Maria-based IUAW reported 28 contracts covering 1,400 jobs. However, in November 1985 the IUAW collapsed after a court ordered the union to pay $700,000 for calling an illegal strike at Berreravia Farms. The Fresh Fruit and Vegetable Workers Union Local 78B, based in the Imperial Valley, has 16 contracts which cover both field workers and packing shed workers.

Union organizing and bargaining activity has slowed since 1975-76. During the first six months of the Agricultural Labor Relations Act, the Agricultural Labor Relations Board conducted 430 elections and unions were certified in 96 percent of the valid elections. In 1984-85, there were only 31 elections, 16 have been validated, and unions became certified bargaining agents in only eight. There were also union decertifications on two farms and expired contracts have not been renegotiated at several other farms.

UFW wages for general farm labor increased from an average $3.14 in 1976 to $6.31 in 1985 (Table 16). The general farm laborer wage is usually the lowest wage offered to farmworkers, that is, all workers are guaranteed the general laborer wage even if they work under a piecerate wage system. There is no directly comparable state or federal wage series for general farm labor. The comparison wages from the USDA's Farm Labor report in the top half of the table include union and nonunion and skilled and unskilled farmworkers, thus overstating the wages a general farmworker could expect. The reliability of the hourly wage estimates from EDD's Farm Labor Report, 881A, is not known.

Table 16. Farm Wage Trends, 1975-1985

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	Percentage Change 1975-79	1976-79	1980-84
	dollars per hour											percent		
United States														
Private Non-Ag. Earnings[a]	$4.53	$4.86	$5.25	$5.69	$6.16	$6.66	$7.25	$7.68	$8.02	$8.33	--	36.0%	26.7%	25.1%
Farms[b]														
All Workers	2.29	2.53	2.77	2.93	3.23	3.52	3.92	4.00	4.11	4.16	4.52	41.0%	27.7%	18.2%
Piecerate	2.68	2.94	3.12	3.38	3.75	4.04	5.09	4.74	4.52	4.60	5.61	39.9%	27.6%	13.9%
Hourly	2.28	2.50	2.76	2.95	3.25	3.53	3.86	3.91	4.07	4.12	4.37	42.5%	30.0%	16.7%
Fieldworkers[c]	2.14	2.37	2.56	2.74	3.05	3.36	3.78	3.83	3.91	3.93	4.53	42.5%	28.7%	17.0%
California[b]														
All Workers	2.80	3.08	3.5	3.61	3.87	4.35	4.70	4.89	4.85	5.16	5.57[d]	38.2%	25.6%	18.6%
Piecerate	3.22	3.55	4.40	4.68	5.14	4.59	6.43	6.20	6.20	6.79	6.92[d]	59.6%	44.8%	47.9%
Hourly	2.62	2.92	3.26	3.34	3.59	4.00	4.29	4.48	4.58	4.83	4.91	37.0%	22.9%	20.8%
Fieldworkers[c]	2.59	2.88	3.20	3.28	3.60	4.01	4.37	4.69	4.58	4.88	5.31	39.0%	25.0%	21.7%
Union (U)[e,f] and Average (A)[g]	--	--	--	--	--	--	--	--	--	--	--	--	17.2%	--
Statewide and Union Avg.	--	3.14[h]	3.25	3.40	3.68	4.33	4.77	5.30	5.45	5.85	6.31	--	--	35.1%
Mushrooms (U)	--	--	3.35	3.58	3.92	4.21	4.51	5.10	5.78	6.00	6.30	--	--	42.5%
Nurseries (U)	--	3.10	3.23	3.37	3.58	3.97	4.40	4.79	5.17	5.05	5.11	--	15.5%	27.0%
South Coast (U)	--	3.10	3.23	3.40	3.75	4.19	4.53	4.90	5.31	4.68	--	--	21.0%	11.7%
Ventura County (A)	--	2.48	2.80	3.00	3.20	3.45	3.68	--	--	4.25	4.25	--	29.0%	23.2%
Southern California (U)	--	--	--	3.28	3.39	3.58	4.10	4.52	4.89	5.32	5.68	--	--	48.6%
Vegetables (U)	--	3.10	3.20	3.36	3.43	4.60	5.04	5.51	6.04	6.83	7.13	--	10.6%	48.5%
Central Coast (U)	--	3.10	3.25	3.39	--	5.05	5.46	5.70	6.65	7.00	7.13	--	--	38.6%
Monterey County (A)[d]	--	3.03	3.48	3.48	3.88	4.20	5.75	5.68	6.03	6.33	6.33	--	28.1%	50.7%
South Coast (U)	--	3.10	3.23	3.39	3.64	4.05	5.05	5.50	4.50	5.00	--	--	17.4%	23.5%
Southern California (U)	--	3.10	3.15	3.31	3.35	3.81	4.14	4.35	--		--	--	8.1%	--
Citrus (U)	--	--	--	3.38	3.55	3.71	3.98	4.50	4.50	5.00	--	--	--	34.8%
Southern California (U)	--	--	--	3.38	3.58	3.6	--	--	--	--	--	--	--	--
South Coast (U)	--	--	--	--	3.50	3.68	3.86	4.50	4.50	5.00	--	--	--	35.9%
Santa Barbara (A)[i]	--	--	--	3.25	3.25	3.38	3.93	3.93	4.50	4.55	4.73	--	--	34.6%
Vineyards (U)	--	3.28	3.43	3.53	3.73	4.17	4.71	5.41	5.25	5.74	6.81	--	13.7%	37.6%
San Joaquin (U)	--	3.40	3.43	3.45	3.66	3.93	4.24	4.47	4.89	5.08	--	--	7.6%	29.3%
Kern County (A)	--	2.65	2.88	3.50	3.50	3.30[j]	4.00	4.00	4.00	4.15[j]	4.00	--	32.1%	25.8%
Tree Fruits (U)	--	2.95	3.22	3.35	3.88	4.33	4.65	5.05	5.30	5.71	5.95	--	31.5%	31.9%
Central Coast (U)	--	--	3.23	3.35	3.97	4.40	4.78	5.05	5.30	5.75	--	--	--	30.7%
Santa Cruz (A)[k]	--	2.88	3.10	3.20	3.83	4.50	4.84	5.13	4.50	5.00	5.00	--	33.0%	11.1%

[a]Economic Report of the President. February 1985, p. 276.
[b]U.S. Department of Agriculture, Statistical Reporting Service, Farm Labor, various issues.
[c]In 1975, 1976, and 1977, this included field and livestock workers. After 1977, it included only fieldworkers.
[d]Wages for lettuce preharvest.
[e]Union wages rates are based on the average from one to 32 contracts.
[f]These are the wages for the "general labor" category. Wages are those prevailing on the second week of July for years 1976-1984 and second week of April and for 1981 and 1985.
[g]California Employment Development Department, Form 881A. The form gives a range of wages. The midpoint is printed here.
[h]Number of contracts and average wage, e.g., in 1976 and 24 UFW contracts had an average wage for general labor of $3.14.
[i]Wages are the midpoint of the range for lemon harvesting.
[j]Fresno County data in 1980, 1984.
[k]Wages are the midpoint of the range for apple thinning.

Although the union general farm laborer job classification is not strictly comparable to the USDA and EDD wage series, useful information on wage trends can be derived. Wage changes have been divided into two periods: 1976-79 and 1980-84. From 1976 to 1979, farm wages overall increased faster than union wages. From 1980 through 1984, union wages rose faster than general farm wages.

According to the USDA Farm Labor series, California farm wages increased at about the same rate as U.S. farm wages between 1976 and 1985, i.e., California farm wages were 22 percent higher than U.S. farm wages in 1976, and 23 percent higher in 1985. The California premium for piecerate wages was 21 percent in 1976 and 23 percent in 1985.

Comparing the UFW general laborer wage to the wages of California's hourly wage farmworkers, the union wage premium was 8 percent in 1976 and 1980, and then jumped to 28 percent in 1985. Such an increase suggests that the UFW has had more impact on farm wages since 1980.

Union wages in vegetables jumped after a vegetable strike in 1979-1980, increasing 47 percent in two years, from $3.43 in 1979 to $5.04 in 1981. This jump in vegetable wages explains much of the surge in the USDA reported piecerate wages for California. Other commodities also experienced union wage increases in 1979-1981. General laborer wages rose 26 percent in vineyards and 23 percent in nurseries.

The variance in union wages has increased. In 1977, the average union general laborer wage in 59 contracts was $3.25, and the range was tight, $3.00 to $3.70. By 1985, the average wage across 11 contracts was $6.31, with a range of $4.61 to $7.68. This increased variance in union-wages indicates a

divergence in UFW strategy and the union's different bargaining strength among commodities.

Migrancy

The USDA defines migrants as farmworkers who travel across state or county boundaries and stay away from their usual residences overnight to do farm work for wages. Based on December 1983 interviews with about 130 migrant households nationwide, USDA reported that there were 226,000 migrants, including 55,000 in the Pacific states of California, Washington, Oregon, Hawaii, and Alaska. However, estimates based on the UCD-EDD 1983 survey show that migrants make up about 40 percent of California's farm workforce.

Most USDA demographic and earnings data are available only for the 226,000 migrants nationwide. According to USDA, 45 percent of the migrants were white and 39 percent black; 33 percent completed high school or some college; 23 percent were primarily in school; half did 25 to 150 days of farm work; 34 percent did more than 150 days; and 16 percent did fewer than 25 days. The USDA reported that 24 percent of the migrants and 21 percent of all farmworkers were in the Pacific region states.

The UCD-EDD survey adopted the same definition of migrants but "found" many more than the USDA report did and the characteristics reported differed. About 40 percent of the workers interviewed reported that they were migrants. If the UCD-EDD survey is representative of California's 620,000 farmworkers, then California would have 244,000 migrants. The USDA reported few significant differences between the characteristics and earnings of migrants and nonmigrants; the UCD-EDD survey found that migrants were more likely to be Mexican-born men.

The UCD-EDD survey divided migrants into two groups: (1) back-and-forth migrants who come to the United States from Mexico each year and (2) follow-the-crop migrants who cross county lines and stay away from their normal California residences overnight to do farmwork (Table 17). About one-fourth of the farmworkers interviewed spent at least one week a year in Mexico, as did one-fourth of the Mexican-born children. Almost one-fifth of the adult farmworkers followed the crops in California, and 6 percent both crossed the border and followed the crops. Mexican-born workers were most likely to migrate: Over 40 percent migrated back-and-forth, followed the crops, or did both, versus 20 to 25 percent of the other workers.

Children in follow-the-crop families are more likely to do farm work than children in other farmworker families. About one-fourth of the Mexican-born 14 to 17 year-olds returned to Mexico each year, one-third followed the crops, and a few did both, so almost one-half of these Mexican-born children were in families whose residence changed at least once during the year. The fact that 60 percent of the children in interviewed households were born in Mexico implies that 30 percent of all farmworker children are in migratory families.

Migration varies by region, with the Sacramento Valley, the North Coast, and the Central Coast regions having 45 to 47 percent migrants. However, the regions closest to Mexico--Southern California and the South Coast--have work forces which are only 27 to 32 percent migrants.

Follow-the-crop migration involved 18 percent of the farmworkers, ranging from a low of 3 percent in the South Coast to 29 percent in the Central Coast. The two major migration streams in the survey were the Monterey-Imperial -Fresno vegetable circuit and the Imperial-Fresno melon circuit (Table 18). Both these migration circuits involve higher-than-average wage workers who are

Table 17. Farmworker Migration in 1983

Worker	Migration				
	Back and Forth[a]	Follow the Crop[b]	Both	Non-immigrant	Number
	percent				
Mexican-born Adults	30.0	20.2	8.1	58.0	1,635
California-born Adults	9.4	14.3	2.2	78.9	224
Other U.S. born Adults	9.4	17.9	7.0	74.6	224
Other country-born Adults	12.1	8.3	0.0	79.5	132
Mexican-born teens (14 to 17)	24.6	33.1	10.2	52.5	118

[a]Back and forth means at least one week-long trip to Mexico or another country each year.

[b]Follow the crop means that farmworkers who stay away overnight from their normal California residence to do farm work.

Source: University of California, Davis-Employment Development Department Survey, 1983.

sometimes employed by the same multiregion employer at each stop on the circuit. Fresno-based migrants, in contrast, do most of their out-of-county work in nearby counties.

Traditional follow-the-crop migration may be declining. The 1966 California farmworker profile reported that 30 percent of the state's farmworkers were follow-the-crop migrants, versus only 18 percent in 1983. However, the 1966 survey used a peculiar multicounty definition of migrant, for example, a worker employed in Sacramento, Yolo and Solano counties was considered nonmigrant while a worker employed in both eastern and western Riverside County was a migrant. In 1966 Mexicans were the largest migrant group (55 percent).

Housing

The UCD-EDD 1983 farmworker survey found that most (80 percent) farmworkers live in conventional houses and apartments. Only about 20 percent of those interviewed lived in public or private labor campus, in trailers or boarding houses, or camp in the fields. But the fact that some farmworkers live at least part of the year in unconventional quarters, raises special policy concerns.

Unconventional housing includes publicly-operated labor camps, private labor camps, and a variety of other types of short-term housing. In 1980, California had 25 public labor camps with a total of 1,936 units serving 6,371 adults for an average of 115 days. A "unit" may be a shared bunkhouse, a single room, or a house. A December 1984 survey reported that there were 2,552 private labor camps in California, but only 1,145 camps with a total of 33,302 units were active.

The number of workers who live temporarily in public or private camps is not known. One study reported that about 12,400 adults and children lived in public camps in 1980, or 6.4 persons per unit in the 1,936 units available. Private camps tend to have more barracks-style units for single men, so if each private unit held one or two, 33,000 to 66,000 workers might be housed in private camps. A maximum 66,000 privately-housed workers and 6,400 publicly-housed adult workers means that a maximum 70,000 farmworkers or 11 percent of the total live part of the year in labor camps.

Trailers, mobile homes, and open fields are also temporary places where workers live, but it is not possible to determine the number of such "units" or the number of workers involved. Trailers and mobile homes are common in several short-season harvests in remote areas, such as the spring vegetable harvest around Huron and the summer melon harvest on the West Side. Open-field housing is common for northern San Diego vegetable workers, where growers have only short-term leases on land awaiting urban development.

The 1983 UCD-EDD survey obtained responses from 1,266 households on housing (Table 18). The predominance of conventional housing was unexpected. Even 69 percent of the families whose status was illegal lived in houses or apartments. Only half the single men lived in conventional housing; a significant fraction of this group lived in barracks or rooming houses. Fourteen workers or 5 percent of the single men lived in the open fields at the time of the interview. Thus, most farmworker families rent or own housing, and most renters rent from private landlords. Single men are more likely to live in apartments, boarding rooms, or barracks.

Table 18. Farmworker Housing by Legal and Family Status

Housing	All Households	Family Status: Family	Family Status: Single Men	Legal Status (families): Green Card	Legal Status (families): Illegal
Number	1266	636	276	495	90
	percent				
House	61.8	71.1	34.8	74.1	52.2
Apartment	17.6	18.2	14.9	18.4	16.7
Trailer	7.0	6.8	8.0	4.8	18.9
Room	6.2	1.6	19.9	0.8	6.7
Barracks	5.0	1.6	15.2	1.2	3.3
Hotel/Motel	0.9	0.5	2.2	0.4	1.1
Field	1.6	0.3	5.1	0.2	1.1
	percent				
Own	19.6	24.0	4.3	--	--
Rent	67.7	67.4	72.3	--	--
Rent-free	11.4	8.6	23.4	--	--
Property Owner					
Number	942	465	227	--	--
	percent				
Owner-occupied	46.5	44.3	45.4	--	--
Public agency owned	20.5	32.0	5.7	--	--
Employer owned	16.6	13.3	27.8	--	--
Owned by relative or friend	16.6	10.3	21.1	--	--

Source: University of California, Davis-Employment Development Department Survey, 1983.

The average rent or mortgage payment of $212 ranged from $148 monthly for one room to $270 for 5 rooms.[1] The average family of four renting 3 rooms spent about one-third of its annual earnings on housing.

The 1966 farmworker survey provides a perspective on changes in farmworker housing. Twenty years ago, 86 percent of the farmworkers interviewed, lived in houses and 6 percent in apartments. Labor camps with cabins were considered houses, so 78 percent of the on-ranch housing was in houses. In 1966, one-third of the farmworkers owned houses or trailers, 38 percent rented (mostly houses), and 20 percent lived "on-the-ranch." Only 15 percent of the 58,000 migrant workers who were heads of households who travelled with their families in 1965, leading to the conclusion that "the problem of housing migrant farmworkers . . . is largely one of housing male, adult workers" (Assembly Committee on Agriculture, 1969, p. 121). About two-thirds of the jobs held by migrant workers in 1965 were on farms that housed workers in barracks (33 percent) or houses (30 percent).

Immigration Reform

The United States is a nation of immigrants, and efforts to change immigration policy are among the nation's most contentious public policy debates. Congressional debate often persists for years before a consensus "reform" is forged, so that major changes in immigration laws occur only once each generation. Major recent immigration reforms occurred in 1952, 1965, and 1986.

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[1]Two rooms, $186; three rooms, $229; four rooms, $244.

Background of the Immigration Reform and Control Act (IRCA) of 1986

The IRCA of 1986 had its origins in congressional attempts in the early 1970s to impose sanctions or fines on employers who knowingly hired illegal aliens. Congress failed to enact sanctions, but presidents Ford, Carter, and Reagan appointed task forces to study illegal immigration to the United States. Each of these task forces concluded that U.S. immigration was "out of control" and that reforms were necessary.

The congressional effort to reform immigration policy which eventually culminated in IRCA began in 1982 with the Simpson-Mazzoli legislative proposal. Simpson and Mazzoli adopted the main conclusions of the Select Commission on Immigration and Refugee Policy, viz, that employer sanctions were necessary to reassert control over U.S. borders, and that a generous amnesty was required in order to obtain the support of Hispanics, churches, and non-Hispanic immigrant groups. The iron fist of sanctions was wrapped in the velvet glove of amnesty and became the central feature of immigration reform efforts.

Agriculture did not play a major role in the immigration reform debate until 1983. When agricultural interests met, it became clear that there was a major difference of opinion. Eastern growers who were using the existing H-2 program to recruit Caribbean workers to harvest Florida sugarcane and Atlantic Coast apples wanted to concentrate on reforming the H-2 program, but western growers concluded that the H-2 program could never be reformed enough to satisfy them. The H-2 program was a contractual foreign worker program, requiring an employer with harvest jobs to advertise for American workers and offer at least stipulated wages and working conditions and then, if American workers were not available, foreign workers could be admitted. Western

growers argued that their "uncertain and unpredictable" demand for labor made it impossible to offer contracts and work guarantees, so they pushed for an alternative to the contractual H-2 foreign worker program.

Western growers established the Farm Labor Aliance (FLA) to lobby for a noncontractual guestworker program. Instead of a farm employer deciding when and how many workers would be needed, the FLA developed a program which would admit foreign workers who would be required to work in agriculture. This pool of floating foreign workers could move from farm to farm, eliminating the need for contracts. The FLA argued that the foreign workers would benefit because they would be free to move from farm to farm, while farm employers benefited by not being forced to deal with the certification procedures of Department of Labor and the Immigration and Naturalization Service.

The FLA surprised many immigration observers by having the Panetta-Morrison guestworker program included in the immigration reform bill approved by the House of Representative in 1984. However, the conference committee which tried to resolve differences between the House and Senate versions of immigration reform deleted the guestworker program and substituted more changes in the H-2 program. The committee could not resolve differences on other issues, such as the possibility that employers would discriminate against "foreign-looking" workers, and so Congress once again failed to approve immigration reform legislation.

The attempt to enact immigration reforms began again in 1985, and this time the FLA persuaded the Senate to adopt the Wilson guestworker program. Opponents of guestworkers such as Senator Simpson had accepted more changes

in the H-2 program to defeat the Wilson program, so that the H-2 program for agriculture was evolving into a special H-2A program.

The compromise which eventually permitted the enactment of immigration reform was developed by the House of Representatives in the summer of 1986. This so-called Schumer compromise substituted an amnesty program for guestworkers--illegal aliens who had worked in agriculture could become legal U.S. immigrants and, if farm labor shortages developed, replacement or replenishment agricultural workers could be admitted.

Provisions of the IRCA

The IRCA affects all employers, but includes special provisions for agriculture. All employees hired after November 6, 1986, must show documents to their employers and sign an INS form (I-9) that affirms their right to work in the United States. This documentation must establish the right to work in the United States (birth certificate or social security card) and the worker's identity (driver's license) or both (U.S. passport). Employers who fail to examine such documentation and maintain the INS forms are subject to an escalating series of fines, e.g., $250 to $2,000 per worker for a first offense, $2,000 to $5,000 per worker for a second offense, and $3,000 to $10,000 per worker for a third offense. Beginning June 1, 1987, all employers must maintain the INS forms on all new hires or risk fines.

The employer sanctions are one leg of the three-legged stool that constitutes IRCA. The second leg is the general amnesty for illegal aliens in the United States continuously since January 1, 1982, and the third leg is the special agricultural program. The general amnesty began on May 5, 1987, and runs through May 4, 1988; applicants for the general amnesty must prove that

they were in the United States illegally since January 1, 1982, and did not commit felonies or receive public assistance while they were here and that their stay was "continuous." Most persons applying for the general amnesty are expected to ask one of the private "Qualified Designated Entities" operated by organizations such as the U.S. Catholic Conference to review their eligibility before filing their applications with the INS. Persons obtain a temporary resident status under the general amnesty and must apply for Permanent Resident Alien (PRA) or a green card within 12 months. Persons who have resided continuously in the United States since January 1, 1972, are eligible for immediate PRA status.

The IRCA includes special provisions for agriculture. IRCA divides agriculture into two categories: Employers who produce "perishable commodities" have considerably more flexibility than producers of nonperishables, and workers employed on farms that produce perishable commodities are eligible for a special amnesty program. Perishables were defined by Congress as "fruits and vegetables of every kind and other perishable commodities" as defined by the Secretary of Agriculture. In April 1987, USDA issued its proposed list of perishable commodities which included fruits and vegetables, potatoes, horticultural specialties such as nursery plants and flowers, herbs, hops, Christmas trees, Spanish reeds, sugar beets, and tobacco. USDA argued that all these commodities are "perishable" and that their production requires an "uncertain and unpredictable" demand for seasonal farm labor.

Many farm employers wanted to be classified as producers of perishable commodities because employer sanctions begin on June 1, 1987, for all employers except those producing perishables. Farmworker advocates also

lobbied for a broad definition of perishable commodity in order to legalize as many illegal alien farmworkers as possible. Producers of "nonperishable" livestock and dairy products, cotton, grains, and sugarcane face fines in June 1987, for knowingly hiring illegal alien workers, and they must hire American or newly legalized workers or temporary foreign workers through the contractual H-2A program. Producers of perishables, on the other hand, do not face paper work requirements or sanctions for knowingly hiring illegal aliens until December 1, 1988, and the illegal alien workers who are or were employed on perishable commodity farms after June 1, 1987, can remain working in the United States even after apprehension if they are likely to be eligible for the special agricultural worker amnesty.

The Special Agricultural Worker (SAW) program is an amnesty program for farmworkers who did at least 90 days of seasonal agricultural work in perishable commodities between May 1, 1985 and May 1, 1986. The SAW amnesty is more generous than the general amnesty: The illegal entry could have been as late as January 1986, SAW workers did not have to remain continuously in the United States, and the standard of proof required to establish 90 days of work is lower. A day of seasonal farmwork is one hour or more, and SAW workers can become greencard immigrants without an English test.

SAW workers may file amnesty applications between June 1, 1987, and November 30, 1988. There is no limit on the number of workers who can obtain amnesty under the SAW program, but the INS estimates that about 400,000 will receive SAW status. The SAW amnesty has two tiers: Workers who did 90 days of work in perishable commodities in each year ending May 1, 1984, 1985, and 1986 will receive Temporary Resident Alien cards and be eligible to become Permanent Resident Aliens (PRA) or "greencard holders" on December 1, 1989.

SAW workers who worked only in 1985-86 must wait until December 1, 1990 to become PRA's.

SAW workers are not required to remain working in agriculture; they have been free to work in any U.S. job since IRCA was signed on November 6, 1986. However, it is believed that some potential SAW workers are no longer in the United States. SAW workers in the United States are likely to remain near their farm employers until they have obtained Temporary Resident Alien cards. SAW workers will be assembling their proofs-of-employment to present to INS, and many are expected to return to or remain with their farm employers through 1987 and 1988.

If SAW workers do not return to work in perishable agriculture, a Replenishment Agricultural Worker (RAW) program may make alien farmworkers available after October 1989. If the secretaries of labor and agriculture agree that there is or was a shortage of labor in 1989, then RAW workers can be admitted. The actual number of RAWs that can be admitted is to be determined by a complex formula, but is capped by 95 percent of the number of SAW workers. Thus, if 400,000 SAW workers are legalized in 1987-88 as expected, then the maximum number of RAW workers in 1989-90 is 380,000.

RAW workers can be admitted only to do seasonal agricultural work in perishable commodities. It is anticipated that many RAW workers will return year-after-year; after 90 days of farmwork in perishables for each of three years, a RAW worker may become a PRA and live and work anywhere in the United States. However, to become a naturalized U.S. citizen, RAW workers must complete five 90-day periods of farmwork in each of five years.

Farm employers of nonperishable commodities can recruit American workers or apply for certification to admit temporary alien farmworkers under H-2A

program. The H-2A program is contractual; farm employers must offer contracts to workers which specify wages and working conditions. Employers decide, e.g., that 100 apple harvesters will be needed on October 1 and then file a form with the Department of Labor before August 1 which offers a piecerate of, say, 50 cents per bushel, a guaranteed hourly wage of $5, and, housing for nonlocal workers; and also explains that workers must take a ladder test. If 50 American workers are recruited, then the employer is certified to admit 50 H-2A foreign workers.

The H-2A program is contractual, so that employers who plan their labor needs can be assured of workers at a pre-determined wage. However, many farm employers have resisted the certification process, alleging, for example, that American workers are not available and that the Department of Labor is biased against farmers. The H-2 program has spawned a great deal of litigation over issues such as the correct minimum wage which would not "adversely affect" U.S. workers, the linkage between this minimum wage and piecerate wages, and job tests and experience requirements demanded by some employers.

Litigation and work guarantees will likely encourage most farm employers who seek certification for H-2A workers to form associations. These associations can spread the cost of obtaining certification across more employers and transfer H-2A workers from farm to farm.

Effects of IRCA

IRCA is complex legislation that will eventually affect all U.S. employers and employees. It is hard to predict its effects, but three patterns are likely: Sanctions will probably work unevenly, fewer illegal

aliens will receive amnesty than expected, and labor costs in agriculture will increase.

Sanctions on employers were included in the IRCA as a tacit admission that illegal entry across U.S. borders could not be stopped. If most illegal aliens enter the United States to work, then "closing the labor market door" with sanctions was expected to deter them. However, the history of sanctions indicates that sanctions work best where they are needed least: Major employers who inadvertently hired an illegal alien worker are now likely to screen out such workers, but employers who depend on an illegal alien workforce are not likely to be deterred. Farm labor contractors (FLCs), for example, have been subject to federal employer sanctions for knowingly hiring illegal alien workers since the mid-1960s. But there are more FLCs in the mid-1980s apparently hiring more illegal alien workers than ever before, since most observers believe that most California FLCs have workforces that are at least 50 percent illegal. Stricter enforcement is possible, but it has not been applied to FLCs.

It is hard to predict the number of persons who will receive amnesty because there are no reliable data on the population of illegal aliens. Amnesties in other nations, however, consistently yield fewer new legal residents than predicted. The reasons for these lower than expected amnesties vary, but factors frequently cited include: overestimates of the illegal alien population, stringent qualification requirements, and illegal aliens' fears about exposing themselves to the enforcement agency that they have always before eluded.

If sanctions and amnesty are even partially successful, labor costs are likely to increase. The 1990s slowdown in labor force growth will put upward

pressure on entry level wages, and the minimum wage is likely to jump from $3.35 to $4.45 or more, an increase of 33 percent. Many farmers who have depended on illegal alien workers have not raised wages since 1981, when the minimum wage became $3.35 and most farm wages were adjusted to the minimum or a multiple of it. Financial difficulties, an ample supply of labor, and low levels of union activity have reduced real farm wages in the 1980s, so that a sudden jump in the minimum wage would force farmers to make adjustments.

The longer-term effects of the IRCA are even harder to predict. However, one effect is clear: The 1960s goal of integrating farm and nonfarm labor markets is dead. Instead of encouraging farmers to offer fewer and better jobs and upgrading worker skills with training programs, Congress has decided that an immigrant workforce is an integral part of labor-intensive agriculture, and IRCA will maintain and probably enlarge the role of immigrant farm workers.

Postscript: Data Needs

This report has reviewed what is known about California's farm employers and workers based on the data that are available, including two farmworker surveys--one in 1966; the other in 1983. In both, those surveyed were chosen from a random sample of workers in the state's employment records.

The 1966 survey began with 742,300 social security numbers included in disability insurance or unemployment insurance records which contained farm earnings by employer. Employers provided to EDD their addresses and information about major farm commodities produced, when they obtained tax numbers; therefore, worker employment patterns by commodity and area could be generated from the survey data.

The 1966 survey divided farmworkers into three groups based on their 1965 farm earnings. One percent of the workers earning more than $500 in farm wages and 0.3 percent of those earning $100 to $499 were sampled (no one earning $99 or less was surveyed). The total sample was comprised of 3,488 workers:

Farm Earnings	Total Workers	Sampling Ratio	Sample
$99 or less	256,000	0	0
$100 to 499	196,400	0.3%	589
$500 or more	289,900	1.0%	2,899
	742,300		3,488

These 3,488 workers were randomly selected by choosing those in each group whose social security numbers ended with "45." Letters were mailed to the employers of the selected workers requesting 1965 hourly and weekly wages, major commodities, and the most recent address of each worker sampled.

Workers in the sample were from some 13,300 farms in 1965; letters were sent to each farm. Eventually 11,200 employers or 84 percent responded, providing information on 92 percent of the workers in the sample. Letters were then mailed to these workers at employer-provided addresses. Thus, interviewers were able to contact some workers in the sample at the employer-provided addresses. Most workers, however, were located after they began work in 1966 when employers forwarded current worker-information to EDD which was transmitted to local Farm Labor Service (later EDD) interviewers.

The 1965 and some 1966 earnings and other employer-provided information were copied onto questionnaires to stimulate worker recall. Workers were paid $3.00 for the interview; most of the interviews were conducted at worker residences. Some workers who had moved out of California were interviewed, but plans to interview workers who had returned to Mexico were aborted by the Mexican government.

A total of 2,028 workers was interviewed, 58 percent of the sample. Over 40 percent of the sample was not interviewed because the workers could not be located. Only 42 workers or 1.2 percent of the sample were located but refused to be interviewed. Many workers could not be located because they had farm earnings in 1965 but no farm or nonfarm earnings in 1966, suggesting that they had temporarily or permanently exited the work force.

A similar process was followed in 1983. This survey also provided rich data--relative to the near dearth of details about farmworkers from other sources. The two surveys allowed us to make meaningful comparisons over time and provided considerable understanding about how the state's farmwork force has changed over the 17 year period. However, more and better information is

urgently needed if policy makers are to adequately deal with the issues discussed above.

One approach might be to begin with the approximately 620,000 social security records indicating farm earnings. These worker records, together with data on 32,000 employers, could be used to examine the distribution of farm and nonfarm earnings among workers and farm and nonfarm employers.

After completing an aggregate analysis, data on farmworker characteristics and needs could be obtained by interviewing a random sample of workers. Such a sample could be drawn as in 1965, taking different percentages of workers from various earnings groups, e.g., 0.1 percent of those earning less than $1,000, 1.0 percent of the $1,000 to $8,000 group, and 0.5 percent of the $8,000 and above group. As in 1965, the interviews could be conducted by EDD farm labor specialists.[1]

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[1]To expedite locating workers, the social security numbers of workers selected for the sample could be entered in the EDD computer to trigger wage reports and identify their employers.

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