

Between 1950 and 1980, the average number of farmworkers employed in California agriculture increased 3 percent, from 218,000 to 224,000, while the average employment of farmers and family workers declined 52 percent, from 132,000 to 64,000. Statewide statistics are not always reliable indicators of what has happened to the farm labor market in specific commodities, and the apparent stability of average farmworker employment obscures the dramatic changes that have occurred in particular commodities.

Cotton, sugarbeet, and processing tomato mechanization, for instance, eliminated thousands of harvest jobs. Management changes also displaced farmworkers; fields and orchards are re-picked twice instead of four or five times, and 40- to 60-pound lug boxes have been replaced by field bins and forklifts. On the other hand, the acreage and production of labor-intensive grapes, avocados, and vegetables have expanded, creating farmworker jobs. More farmworkers are also needed because of increased irrigation, double-cropping, and the transfer of land from small family farms to large, specialized growers who rely on hired workers.

This article examines four labor markets: Yolo County processing tomatoes, Watsonville strawberries, Salinas lettuce, and Fresno melons. A brief background on each commodity is followed by an analysis of the demand for labor, the supply of labor, and the operation of the farm labor market, and by an evaluation of the four labor markets.

Processing tomatoes

The 5.6 million tons of processing tomatoes produced in California in 1983 were worth \$367 million, second only to lettuce in value among California's major vegetables. Processing tomatoes occupy a special place in the debate over farm labor markets, because University of California plant scientists in the 1950s developed tomato varieties that ripened uniformly, and UC engineers constructed a machine that harvested tomatoes mechanically. In 1963, more than 38,000 young men, 95 percent of them Braceros from Mexico, picked 136,000 acres of processing tomatoes in California for piece-rate wages. Twenty years later, 9,800 women and teenagers sorted the mechanically harvested tomatoes from 220,000 acres (a 62 percent increase in acreage) for hourly wages of \$3.35 to \$3.50.

The processing tomato illustrates two phases of labor-displacing technology. During the first phase (1964-1975), the mechanical harvester changed the work force composition (from men to women) and the wage system (from piece rate to

hourly). After 1975, an electronic eye began to displace the minimum wage sorters. Use of an improved drum tomato shaker and sorter has reduced sorting crews to only three or four workers in the mid-1980s.

In Yolo County, for example, the 2,100 sorters employed in 1983 were primarily the wives and children of a ranch's equipment operators and irrigators. Most ranches can rely on two seasonal sorters for every regular semi-skilled worker, and the families of such employees comprise about two-thirds of the sorting work force. These citizen and legal green-card workers are supplemented by illegal or undocumented workers who migrate into Yolo County during August-September. Jobs for these migrant sorters are disappearing as technology improves, but growers still hire extra sorters if, for example, rain requires more careful sorting.

A typical tomato sorter earns \$700 to \$1,400 during the eight- to ten-week harvest. Many sorters are unemployed after the harvest and can obtain unemployment insurance benefits of \$70 to \$100 weekly until they draw one-half of their earnings. Growers and workers contribute to Social Security, and growers contribute to unemployment and workers' compensation benefits, but few growers offer health insurance, pensions, or paid vacations. Instead of seniority lists, growers remember who the best sorters are and hire them first if they appear at harvest time. There are no union contracts for Yolo County tomato sorters.

Eventually, the processing tomato labor market will offer fewer sorting jobs. Electronic eyes are replacing human sorters, and production may diminish because per capita consumption of canned tomato products has stabilized. Imports, especially from Italy, have thwarted expansion of the U.S. processing tomato industry.

Strawberries

California produced 72 percent of the U.S. strawberry crop in 1983. Strawberries are grown on only 11,400 acres of land in California, but each acre yields almost \$26,000 in berries, making the state's crop worth almost \$300 million. Few crops have such high gross returns per acre; corn and cotton, for example, had gross returns in 1983 of \$480 and \$800 per acre, respectively.

Santa Cruz County's Watsonville area has about 10 percent of California's strawberry acreage. In the 1960s, half of

the area's strawberries were sold in the fresh market and half were sold to processors. In the early 1970s, Mexican producers began to dominate the processing market because of lower wages and lower sugar prices in Mexico. Watsonville growers made a successful transition to production for the fresh market. Today, growers use the area's few remaining processors as a safety valve for surplus or low-quality berries.

Strawberries are one of the most labor-intensive commodities grown in California. In the Watsonville area, production costs average about \$17,000 per acre; wages per acre are \$8,544 or 50 percent of production costs. The need for careful planting, cultivation, and harvesting has pushed growers to large operations with 35 acres or more and peak work forces of at least 70 persons, or to small, 3- to 20-acre plots that rely extensively on family labor. The 3-acre plots are often operated by sharecroppers who obtain land, seedlings, marketing services, and sometimes advice from the landowner in exchange for supplying labor.

The Watsonville strawberry season extends from May through September, and the hired work force peaks at 2,000 in early June. This number has been increasing as acreage and yields rise; in 1970, the peak was 1,340. Harvest workers can find strawberry jobs for about six months each year.

The Hispanic harvest workers include two distinct subgroups: year-round residents and migrant workers. Year-round residents, citizens or legal green-card immigrants, often return to the same farm each year. Migrant workers arrive in the Watsonville area each June, and these frequently illegal immigrants are often friends or relatives of year-round workers who tend to find harvesting jobs with smaller growers. It is hard to determine how much of the strawberry crop is harvested by illegal migrants, but informed opinions seem to concur in estimates that illegal workers pick 50 to 70 percent of the crop.

Strawberries are picked directly into the pint-sized boxes sold in supermarkets. Harvest workers pick berries into 12-box trays and are usually paid an hourly wage plus a per-tray piece-rate that enables most harvesters to earn about \$7 hourly for 35 hours each week, or almost \$250 per week. A harvest worker's season-long earnings depend on how many weeks work is available, but earnings can reach \$6,000 for six months of harvest work. Year-round

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California's harvest labor force

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residents typically draw up to half their harvest earnings in unemployment insurance benefits.

California and Florida produce most of the nation's fresh market strawberries, and producers in both states argue that Americans refuse to or are unable to pick strawberries despite relatively high wages. The pending Simpson-Mazoli immigration reforms that promise to stop illegal immigration and permit growers to import temporary foreign workers, if unemployed American workers are not available, should encourage large growers to expand, because their costs of obtaining U.S. Department of Labor certification to admit alien workers can be spread over more workers. Smaller sharecroppers, often Mexicans, who rely on family workers and illegal migrants, will probably be denied access to temporary foreign workers unless they form labor co-ops to handle the certification paperwork.

Lettuce

The lettuce work force and labor market has been studied more extensively than those of any other commodity. Lettuce is the most valuable vegetable grown in California, and the 1982 crop worth \$469 million was 72 percent of U.S. production. Since 1975, California's lettuce acreage has decreased 5 percent, but rising yields per acre have increased production 13 percent.

Lettuce has been labeled "green gold" because of its potential profits. In 1981, preharvest production costs were \$1,300 per acre, and harvest costs were about 95 cents per 24-head or 50-pound carton. Production averaged 30,000 pounds or 600 cartons per acre, so costs of pro-

duction (excluding land rent) were about \$3.05 per carton in 1981. Grower prices ranged from \$3 to \$9, and if a grower was "lucky" enough to have his entire crop mature during the high price window, profits of up to \$3,530 per acre were possible.

Demand for labor to produce and harvest lettuce increased after 1966. In the Salinas area, lettuce is double-cropped, so peak demand for labor occurs in June when the spring crop is being harvested and the late-summer crop is being cultivated. During the June peak, almost half of Monterey County's 24,000 hired farmworkers are employed in lettuce.

Most lettuce workers are Hispanic. Until the advent of seniority systems in the 1970s, harvesting was done primarily by young men; women and older men filled thinning, hoeing, and irrigation jobs. Most growers have established employee lists to determine the order of layoffs and rehiring. High wages and the predictability of being rehired have made lettuce workers older than average, with many 30- to 45-year-old workers hand-cutting and packing lettuce into cartons. The substitution of wrap machines for ground packing has increased the number of female workers. Wrap machines have conveyor belt arms on each side that permit workers to cut and lift each head of lettuce onto the belt and then have each head wrapped and packed into a carton. Since the speed of the wrap machine can be controlled by the grower, workers are typically paid an hourly wage of \$6.50 to \$7. Workers who cut and ground-pack unwrapped lettuce are encouraged to work rapidly by a piece rate of about 85 cents per carton.

The dynamics of labor and technology have changed the harvest forces in California crops. Mechanization and field packing have created more jobs for local women and older men in melon, processing tomato, and lettuce fields; strawberries remain dependent on a supplemental illegal alien work force. (Strawberry photo by Franz Baumhackl; melons and lettuce by Mel Gagnon; tomatoes by Tracy Borland)



Lettuce wages are among the highest farm wages in California. Monterey lettuce wages have increased more than 300 percent since 1966, but most of this increase occurred after 1975. In the late 1960s, Imperial County lettuce wages were 3 to 10 percent higher than Monterey wages, but Monterey wages rose in 1970 and exceeded Imperial lettuce wages by about 17 percent in the early 1980s.

Lettuce wages increased in spurts — in the early 1970s, in 1975, and in 1979-80. These wage increases are closely associated with periods of union activity, as the United Farm Workers (UFW), Teamsters, and several smaller unions competed for members and contracts, encouraging nonunion employers to increase wages and fringe benefits to avoid organization. During the late 1970s, about 60 percent of the Salinas lettuce crop was harvested under union contract; in 1984, only 25 percent of Salinas lettuce is expected to be harvested under union contract (the UFW is certified as bargaining representative for another 25 percent of the crop).

Workers queue for lettuce jobs, so employers typically screen applicants for experience and legal status. An estimated 70 to 80 percent of the Salinas lettuce work force is legally entitled to work in the United States.

A mechanical lettuce harvester that selects only mature heads has been developed, but it is not used commercially because harvest labor is readily available. Hand-harvesting costs are competitive with mechanical harvesting, because the machine will occasionally select a nonsalable head of lettuce that is not discovered until after it has arrived at an East Coast market. Hand harvesters can ensure that the carton contains only salable lettuce, and because transportation adds another \$3.50 to \$4.50 per carton to get lettuce to East Coast markets, hand harvesting is cost efficient.

Mechanical harvesting of heads of lettuce for supermarket consumers probably will not spread rapidly; it appears more likely that lettuce harvest workers will be displaced by the bulk handling and shredding of lettuce for the institutional market. Bulk handling, shredding, and packing in 10- to 20-pound bags appear amenable to mechanization.

Melons

Fresno County produces almost one-third of all U.S. cantaloupes during its short July-August marketing season. Melons require labor to plant, thin, prune, and weed before they are ready to harvest, but the harvest requires 65 percent of the total labor used. The

melon harvest appears to be on the verge of a packing change that promises to change the work force and wage system.

As melon farms expanded to 1,000 or more acres, growers usually picked melons into trucks and then hauled them to packingsheds where they were sorted, sized, packed, and cooled. Many large growers and packers operate throughout California to extend their marketing seasons, and the melon work force evolved into Imperial Valley-based picking and packing crews who moved north with the harvest.

The melon harvest has two distinct work forces and labor markets: field workers and packingshed workers. Field workers are Hispanic men between the ages of 18 and 40 who pick each melon and put it into a bag tied around the waist. When the bag contains 15 to 20 melons, the full bag is walked up a plank and dumped into a truck. Melons ripen rapidly in the Central Valley's hot sun, so each field must be repicked every two or three days. During the 6:00 a.m. to 1:00 p.m. workday, a typical crew of 10 to 15 harvesters walks 4 miles, covering 500 acres.

The field crew divides the piece rate wage equally. In 1983, the prevailing Fresno piece rate was \$6.40 per foot of melons loaded on the truck, enabling an average crew member to earn about \$5 hourly. Because the piece rate is divided equally, the crew handles recruitment and discipline: if more workers are needed, a current crew member brings a friend or relative; if a picker is not working fast enough, he will be terminated by the crew, a sanction that leads to workers literally running in the 100°F heat. There are no reliable figures, but it is estimated that 50 to 70 percent of the field workers are undocumented workers.

Packingshed workers sort and pack melons that are moved to them on conveyor belts. Melons are very perishable, and harvest walkouts enabled most packingshed workers to organize into unions and obtain relatively high wages that the packingsheds then passed on to growers. In 1983, hourly wages in unionized sheds ranged from \$8 to \$12.

Packingshed workers also tend to be Imperial Valley-based migrants who follow the harvest northward. However, many packingshed workers are white, often the descendants of Oklahoma and Arkansas migrants to California in the 1930s.

Packingshed wages are typically twice as much as field workers' wages. This wage difference, combined with improvements in field packing technology, has encouraged some growers to pick and pack melons in the field. Field

packing means that harvesters place melons on a conveyor belt as it moves through the field, and packers standing on a platform pack the melons. Elimination of the 50- to 70-pound bags changes the composition of the harvest work force to include women and older men and the employer's ability to control the speed of the conveyor belt changes the wage system from piece rate to hourly. Harvesters pick only melons that can be sold, eliminating the cost of sorting and hauling culled melons. Less handling also yields fewer bruises, but this quality advantage is partially offset by delays in getting field-packed melons into a cooler. Expected improvements in automatic field sizers, packing cartons, and portable cooling should make field packing more advantageous.

Shed packing is best suited for large acreages, since a shed permits harvesting and packing specialization. However, fixed investments in sheds used only two months each year, high shed wages, and increasing hauling charges made field packing 50 to 75 cents per carton cheaper in 1983.

It appears that melons are a commodity on the verge of shifting from specialized picking and packing work forces to integrated field picking and packing operations. This switch will eliminate jobs for relatively high-wage young men who earn piece rates, and create hourly wage jobs for women and older men.

Conclusions

The California farm labor market reflects the dynamics of labor, technology, production, and marketing. Mechanization in processing tomatoes displaced Bracero men who earned piece-rate wages and created hourly wage sorting jobs for local women. A similar work force and wage system change accompanied field-packing: jobs for piece-rate men disappeared, and hourly jobs for women and older men appeared. As labor and technology continue to change, the tomato and melon industries indicate that agriculture may begin to employ more and more women.

Strawberries and lettuce offer different lessons. The strawberry industry increased yields and switched to producing for the fresh market in the early 1970s, but it remains dependent on a supplemental illegal alien work force despite relatively high wages. The lettuce industry has restructured its work force and wage system and offers some of the highest farm wages in California to a mostly legal and local work force.

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