

# **Agricultural Labor Markets, Management, and Technology for the Future**

Howard R. Rosenberg\*

## **Introduction**

An effective labor market in California is critical to agricultural industries and to all of us who depend on them. How much longer can the market as currently structured sustain producers, workers, and our society as a whole?

The farm labor rules have changed, and they have uncertain implications for the near-term economics as well as long-term structure of California agriculture. Since passage of the Immigration Reform and Control Act of 1986 (IRCA), concern about the supply and management of agricultural labor has grown, but this critical factor of production has long been worthy of greater attention. Some 20-25 percent of overall farm production expense in California still goes to hired workers (California Department of Finance, 1988), who have a lot to do with how effectively the other 75-80 percent is used. Global market competition and other economic forces making production efficiency more essential may turn out to be much more influential than government regulations on labor markets and management.

People make the system run. Human labor is a most essential and complex factor of production at every level in California's food and fiber system. The need for farm labor is derived both from the demand for agricultural commodities and the technologies used to produce them. Since both commodity demand and production technologies continue to change, so do farm labor needs. Farm labor is dispersed around the state and draws on the myriad skills of people in such jobs as irrigator, picker, pruner, tractor or truck driver, herdsman, crew supervisor, biologist, bookkeeper, mechanic, manager, and attorney.

What farm workers and other personnel in the food chain do on the job has consequences for all of us, regardless of our stake in the system. Their performance affects the survival and profitability of food-related businesses, employee quality of life, and the availability, quality, and prices of products that everyone needs.

## **The Agricultural Labor Market**

### ***Need for Labor***

Knowledge about agricultural labor is remarkably fragmented, perhaps because it has so many dimensions. Labor may be thought of in terms of numbers of jobs and people, costs of production, wage rates and earnings, employee working and living conditions, union-management

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relations, conflicts that disrupt workplaces and the flow of products to market, and government regulation of all the above.

How many people work in California agriculture? The answer depends on where the system boundaries are drawn as well as when and how the count is made. Because of measurement and reporting limitations, estimates of employment are less reliable than those of production tonnage. One estimate is that farm employment in California averages about 365,000 (California Employment Development Department, EDD, 1989). There are roughly five more jobs in agricultural input, processing, distribution, and retail industries for every one on the farm, so average overall employment in the California food and fiber system exceeds two million. No single day, however, is average. There is seasonal variation in both the total employment level and type of work performed in the system, particularly at the farm level.

Even at the farm level, extremes are more pronounced in some crops than others. In September 1988, for example, California grape growers employed an annual high of 77,036 workers but just one month later had their low of 21,855. But dairy farmers employed a monthly labor force of about 13,000 year round with very little month to month variation. The coefficient of variation for monthly employment in grapes was 92 percent greater than for dairy, reflecting the instability of vineyard jobs.

Although seasonal swings are most pronounced in fruit and vegetable crops, other crop sectors are also affected by farm employment variation. Seasonality of need poses problems for both buyers and sellers of agricultural labor. If all production work were spread evenly through the year, the annual demand for labor-hours or days would remain about the same, but the number of people needed to provide them would be dramatically reduced. There would be far fewer personnel transactions (hirings and layoffs), and it would be much easier to structure terms of employment attractive to workers.

Mechanization, the application of machines to task performance, has altered patterns of demand for labor. Labor-saving mechanization, along with biological advances, has eliminated many field jobs and further concentrated peak demands for post-harvest labor. These changes have occurred more in field crops and livestock than the traditionally labor-intensive fruits and vegetables. Generally, mechanization has been applied to tasks that are strenuous or repetitive and processes to which inputs are relatively uniform (e.g., plowing fields, threshing wheat, harvesting sugar beets). Operations on more variable or fragile inputs under less predictable conditions (picking strawberries, pruning grape vines, thinning peach trees) tend to require high levels of sensory perception, judgment, and manual dexterity, and so are performed mainly through labor-intensive methods.

While usually reducing the number of jobs to be filled, mechanization has also created new tasks to be performed by people. Furthermore, it has changed the nature of remaining manual jobs. Jobs in mechanized production systems tend to require a different set of skills, sometimes possessed by a broader segment of the workforce but also sometimes tending to exclude workers employed under the earlier technology. Operation, service, and repair of labor-saving equipment requires not only physical coordination but also technical understanding and skills in problem diagnosis, mechanics, mathematics, and communication. In addition, the administrative skills to

structure such work and effectively manage the people who perform it are different from those commonly used in labor-intensive field work.

Technological advances that reduce or shift employment opportunities are controversial. In displacing individual workers they may also intensify social service needs and alter rural communities (Just, Schmitz, and Zilberman, 1979). While social ramifications of rapid technological change are particularly severe in areas without developed nonagricultural economies, lack of such change may merely forestall even greater impacts. Adoption of new production tools and techniques can contribute to maintaining viability of commodity industries and thus any employment within them. Nevertheless, critics have taken issue with public institutions and employers for not projecting and mitigating problems related to mechanization (Council for Agricultural Science and Technology, 1983).

Some technological changes run counter to the labor-saving trend. Increasing public concerns about environmental quality and pesticide residues in food have resulted in a movement toward production practices that decrease the use of synthetic chemicals (i.e., fertilizers and pesticides). Expanded use of “low input,” “organic,” or “sustainable” cultural practices could significantly affect the demand for labor. Cutting back the use of herbicides, for example, increases the need for “hand weeding.” Often complementing these alternative production systems are alternative marketing activities, particularly direct selling through farmer’s markets and on-farm sales. The extent of additional labor that these methods require in field or marketplace may be an important factor in decisions about whether to adopt them.

From 1950 to 1983 total work hours devoted to farm production on the Pacific Coast were cut by half. Livestock led the way with a 76 percent reduction in hours, followed by fieldcrops, in which total work time was trimmed 62 percent. In contrast, hours in fruits and nuts fell only 29 percent, and vegetable hours actually increased 19 percent (U.S. Department of Agriculture, 1983). By 1983 hours worked in fruits, nuts, and vegetables accounted for more than three-fifths of total farm production time on the Pacific Coast and more than four-fifths of all crop hours.

Although labor provided by farmers and unpaid family members—who perform most of the work on smaller livestock and field crop farms—has been decreasing in California, average agricultural employment of hired workers has risen steadily since the early 1970s. Aggregate employment effects of major labor-saving changes in fruit, nut, vegetable, and fiber production (e.g., mechanical harvesting of processing tomatoes, cotton, tree nuts and wine grapes, electronic sorting, and increased herbicide use) have been offset by expansion in acreage and yield of labor-intensive specialty crops (e.g., strawberries, avocados, nectarines). Some newly introduced labor-intensive crops (e.g., luffa, bok choy, bitter melon) meet market demands of fast growing ethnic and immigrant communities. Improved production efficiency at the farm level has helped maintain jobs in processing, packaging, and associated industries.

The inducements offered to workers in agriculture and the contributions required of them vary as widely between and within commodity sectors as do levels of employment. The nature of work to be done, local and industry customs, employer preferences, and regulatory constraints all shape the conditions to which individuals respond in their decisions to join, to stay, and to perform in different parts of the system.

Dual labor market theory recognizes a “primary market” of jobs in which relatively high wages, good working conditions, employment stability, and opportunities for advancement are common. The “secondary market” is associated with easy entry, low pay, undeveloped post-entry job allocation (promotion, transfer, open bidding) policies, and unstable product demand or production schedules, all of which tend to induce rapid turnover (Doeringer and Piore, 1971). While a gamut of characteristics is found in California agriculture, the primary market model tends to describe jobs in management, horticultural science, engineering, machine operation and maintenance. On the other hand, manual seasonal work, comprising a much larger share of all farm employment, more often fits the secondary market model. Pay, benefits, and the lack of stability of these farm jobs make the “average” terms of employment in agriculture markedly inferior to those in primary blue-collar nonfarm jobs. The typical compensation for strawberry picking, grape vine pruning, or peach thinning, for example, is less than for automobile assembly work, even though these jobs all require judgment, manual skills, and stamina.

### *Supply of Labor*

Although the terms “labor supply” and “labor demand” are often used as though they represent fixed quantities, both vary as a function of other factors. Labor usage or employment during a period might be viewed as a measure of demand, but there is no such even arguable gauge of supply. Labor supply is elastic with respect to the “price” (wages and other aspects of attractiveness) offered for it. How many people would conceivably make how many days available for farm work? More than could be used, if the terms of employment were attractive enough. The catch, of course, is that increasing job attractiveness often raises employer costs, and the ability to pay costs is disciplined by the product market.

Three to four times as many people perform farm work in California at some time during the year as there are full-time equivalent farm jobs. In the nation as a whole, year-around and regular workers (those who work more than 249 and from 150-249 days per year, respectively ) are estimated to make up less than one-fourth of the farm labor force, although they account for more than two-thirds of days worked. Seasonal workers (25-149 days) make up roughly one-third of the labor force and put in one-quarter of the days worked. Casual workers (less than 25 days), almost half the total number in the farm labor force, perform a very small portion of the work (Smith and Coltrane, 1981).

The different employment sectors tend to attract and admit workers with differing interests, abilities, and backgrounds. Economic, social, and institutional factors keep secondary sector workers from getting a foothold in primary employment. While some farm workers find compensating advantages in the secondary sector, most would prefer higher pay, less uncertainty, more employment, better housing, health care and child care for their families, and greater occupational dignity than their jobs afford.

Although farmers and their family members still perform many farm jobs in California, hired workers have gained in relative importance. As it has for the past century, California agriculture currently relies on inexpensive labor in strenuous, seasonal jobs of short duration for wages and under conditions that most American citizens shun. Manual field jobs that do not appeal to most

settled U.S. residents have continued to attract people facing much poorer alternatives in other nations. With relatively little difficulty, farmers have been able to procure enough human effort at affordable cost to operate labor-intensive production technologies.

Meanwhile, changes in composition of the overall California workforce have been more pronounced than in agriculture. A most striking change is the 73 percent increase in female labor force participation and the 13 percent decrease in male participation from 1950 to 1987 (U.S. Department of Labor, 1985). Women are projected to comprise 45 percent of all workers by 1990. The Hispanic population, its share of the work force and its social-political influence in California continue to grow. A large recent influx of Asians has also notably augmented the work force. Aging of the baby boom generation, the 1960-70s baby bust, and rising levels of education and living standards among more established U.S. residents leave fewer of them willing to take lower-level, secondary labor market jobs in agriculture. Immigration, however, has offset effects of this demographic trend.

Public policy in this nation and economic conditions in other nations have contributed to persistence of labor-intensive technologies in U.S. agriculture. Many farmers assert that only immigrants are willing, or even able, to do seasonal agricultural work. Union activists counter that plenty of legal resident workers are available but not effectively recruited by farm employers. Whatever the contributing factors, a succession of immigrant groups (Chinese, Japanese, Filipinos, "dust-bowl Oklahomans," Texas Chicanos, and Mexicans) has performed most of the work in California's labor-intensive specialty crops (Fuller, 1939). High turnover and the readiness of new immigrants to step in have been distinguishing features of the workforce in seasonal fruit and vegetable jobs.

The distressed Mexican economy and porous southern U.S. border are helping to maintain this tradition. Swelling population and economic despair in Mexico have dispatched a growing stream of people northward to earn in an hour of farm, food service, and other secondary jobs what they might in a day of scarce employment back home. Farm employers in California have continued to depend heavily on immigrant workers, with or without legitimate papers, to more than meet the demand for agricultural labor.

In a survey of California agricultural employers, 85 percent reported hiring one or more aliens both in 1986 and 1987. Some 71 percent had employed at least one undocumented alien in 1986, and 55 percent in 1987 (Rosenberg and Perloff, 1988). The U.S. General Accounting Office (1989) obtained similar findings for 1987 from a study of growers in Washington, Oregon, and California. One result of illegal immigration has been bounteous agricultural production, undoubtedly achieved at lower cost than if only legal residents did the work. Another result is that millions of illegals have lived in fear of discovery and deportation, at the fringe of social institutions. Many who have not been able to qualify for legal status have stayed in the United States, and others are still coming (Cornelius, 1988).

Legality of presence in the United States is an important but by no means the only significant basis for distinguishing among persons in the immigrant labor force. Mexican farm workers are no more a mass of undifferentiated laborers than are jobs, skills, and terms of employment the same in all of agricultural production. Among the differences that relate to their roles in the labor

market are extent of dependence on agricultural employment, commitment to a particular crop or type of farm work, education, total income, age, family size, skills, generation in the United States, usage of the English language, and cultural assimilation. A classification of Mexican and Mexican-American farm workers that considers all these attributes describes, in ascending order of legitimacy, several worker categories of illegals (“border jumpers,” “adventurers,” “innovators,” and “climbers”) and legal residents (“commuters,” “opportunists,” “loyalists,” “naturalized,” and “native born”) (Gonzales, 1985). Individuals with less legitimacy (and poorer employment opportunities) commonly aspire to and work toward the types with more.

From June 1987 through November 1988, many farm workers accelerated their progress through these “ranks” by pursuing legal resident status in the United States under the Special Agricultural Worker (SAW) program of the 1986 immigration reform law. Some 1.3 million SAW applications were made nationwide, of which about 760,000 (58 percent) were in the western region, mostly in California. Approval rates through late autumn 1989 were very high, but some 55 percent were yet to be adjudicated.<sup>1</sup> Despite having suspected fraud in about half of the pending applications earlier in 1989, at the end of the year Immigration and Naturalization Service officials were projecting a final composite denial rate of only 15 percent (Ramos, 1989). If that estimate holds true, about 500,000 SAWs will have been legalized in California by the time all decisions are made.

### ***Problems in the Current Market***

Agricultural labor market dynamics have worked well enough to make available at relatively low prices a tremendous amount and variety of food and fiber. California agriculture provides needed goods for domestic consumption and export; it also generates great wealth. On the other hand, the labor system is not free of dysfunctions.

Many farm employers face:

- uncertainty about labor availability at critical times,
- a bewildering array of legal mandates and prohibitions affecting their labor management practices,
- indirect costs of seasonal worker migrancy,
- barriers to communication with their own employees,
- personnel performance and accountability problems,
- loss of human capital with each employee turnover,
- the burden of finding it necessary to operate in violation of law, and
- higher costs and lower product quality than could be achieved under other conditions.

Meanwhile, a large proportion of the seasonal workforce faces:

- uncertainty about finding jobs and earning sufficient income,
- the brunt of migration costs,

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<sup>1</sup>Personal communication with Aaron Bodin, Deputy Assistant Commissioner for SAW Programs, Immigration and Naturalization Service, Washington, D.C., November 1989.

- expense and dangers of illegal immigration,
- family disruptions,
- tenuous recognition and compensation for outstanding work,
- limited advancement opportunity within agriculture as well as mobility outward,
- inadequate personal respect, and
- relatively high exposure to occupational injury and disease.

Agricultural jobs are associated with low incomes. A 1983 survey of California farm workers found an average hourly wage of \$5.10 for agricultural services, just 54 percent of the average rate for manufacturing jobs and less than 37 percent of the average for jobs in construction, mining, or transportation (Mines and Martin, 1986). On a per-week basis, average weekly earnings of \$182 for farm laborers was only 48 percent of average weekly earnings in manufacturing and less than 35 percent of earnings in construction and mining. More than two-thirds of the survey respondents in four-member households had incomes below the U.S. poverty level of \$10,178 (1983 dollars), compared to 10.3 percent in the overall national economy. Average hourly wages in July 1989 were \$6.07 for all hired farm workers in the Pacific Region (California, Oregon, and Washington) and \$5.64 for field and livestock workers (U.S. Department of Agriculture, 1989). Associated with relatively low wages to farmworkers is the percentage of California rural Hispanic families in poverty which has climbed from a low of 20.3 percent in 1981 to a high of 50.6 percent in 1986, dipping slightly in 1987 (Gwynn, Kawamura, Dolber-Smith, and Rochin, 1988).

Seasonality of agricultural production and the concomitant variation in labor demand translates to high job turnover and frequent unemployment for farm workers. The 1983 survey reported that 45 percent of all farm jobs lasted four weeks or less; only 7 percent of all respondents reported working for the same employer for 30 weeks or more. The majority of farm workers pieced together several jobs, farm or nonfarm, throughout the year to earn their livings. Most reported frequent spells of involuntary unemployment totalling an average of nearly one-half year. By contrast, in 1983, a recession year, the U.S. labor force experienced a 9.6 percent unemployment rate, and half of all job losers were unemployed for 10 weeks or less (U.S. Department of Labor, 1985).

Low education level among California farm workers impedes their ability to secure off-farm employment. In 1987 less than 20 percent of Hispanic farm workers over age 25 had completed high school and less than 1 percent went on to college (Oliveira and Cox, 1989). Nearly half had completed five years or less of formal schooling. The migrancy that often accompanies agricultural employment reinforces and perpetuates the low level of education among the California farm worker population. The 1983 farm worker survey found that one-third of all children of Mexican farm workers themselves traveled with their parents in “follow-the-crop” circuits.

While a theory of “compensating differentials” would suggest that better working conditions make up for lower pay, inter-industry evidence supports the dual-market notion that job hazards, insecurity, and lack of advancement generally go together with low pay in secondary sector jobs (Robinson, 1988). And so it is in agriculture. Farm laborers contend not only with poverty but also with dangers of the work itself. Farm work is the nation’s most hazardous

occupation in terms of work-related mortality, with an accidental death rate five times that of the national average. Almost 20 percent of the farm workers surveyed in 1983 reported musculoskeletal problems. Six percent had suffered chemical poisoning from pesticides and herbicides (and many cases of pesticide illness are mistaken for the flu). Another 6 percent reported skin diseases originating at work. In total, some 50 percent of the respondents reported having some type of work-related health problem within the previous two years.

These farm labor patterns yield conflicts within California's social and political fabric. There is discomfort with the dissonance between stated values and the reality of employment, an erosion of respect for law, a strain on social services, and an uncertainty about the sustainability of the system as product market competition intensifies.

### **IRCA as a Stimulus for Labor Market Change**

The Immigration Reform and Control Act of 1986 (IRCA) offers both new and old kinds of alternatives to widespread employment of workers who are here illegally. Its designers acknowledged the patterns molded by historical and current forces but clearly envisioned something different. The logical goal of the new direction is a legal resident workforce and a labor market much less isolated from the rest of our economy. The old direction points to an institutionalized reliance on guestworkers employed under more heavily regulated conditions (Rosenberg, 1988).

Like most laws, IRCA is designed to serve its purpose at the level of society by influencing decisions at the level of the individual. The complex set of inducements and penalties that constitute its mechanism are at once horrendous to administer and ingenious for what they disclose about the contradictory values that need to be reconciled. Diverse interests based this watershed public policy on five dubiously compatible aims:

- To control unauthorized immigration to the United States.
- To not cause undue economic disruptions in economic sectors that have grown dependent on labor provided by people who are here illegally.
- To recognize the stake in and contributions to the United States of many people who have lived or worked here illegally in the past.
- To protect the legal resident workforce from unchecked foreign competition for jobs.
- To reduce the relative isolation of the farm labor market, and thereby to improve conditions of employment in agriculture.

Although not an agricultural law, IRCA treats agriculture specially in ways designed to help the industry adjust to a changed labor market. It deferred the application of sanctions for either hiring ineligible workers or not documenting eligibility of workers until December 1988. It also provided means for specifically expanding the farm labor supply with legal immigrants or guestworkers. The Special Agricultural Worker (SAW) program is granting legal resident status

to a large number of people who worked on farms between May 1985 and May 1986. The Replenishment Agricultural Worker (RAW) program may replenish the agricultural workforce by legalizing additional aliens if needed in fiscal years 1990-93. A third labor supply provision, the H-2A program, enables farm employers to legally recruit and hire temporary guestworkers from abroad *if* (1) they can show that insufficient labor is available for a specific type of job during a given period in a defined market and (2) they offer terms of employment that meet prescribed standards.

IRCA hiring sanctions encourage those employers who have depended on undocumented workers to alter their recruitment and selection practices. The SAW and RAW programs, together with the deferral of sanctions against producers of perishable commodities, help farmers who want to make an orderly transition to legal, resident workers. By no means, however, will these measures alone be sufficient to attract and retain the eligible, qualified employees needed for a “soft landing” from the elimination of illegals. Personnel management policies of individual employers will weigh heavily in capable workers’ choices to join, stay, and perform effectively in farm operations.

Of considerable near-term interest is the extent to which SAWs will stay in agricultural work. Initial surveys indicate that most are still working in agriculture, but their occupational choices are not legally constrained, and departure of many to jobs in other industries is anticipated. Their rate of exit will depend on terms of employment in various agricultural sectors, existence of and perception of alternative opportunities, vocational abilities, language skills, and self-concept. Economic activity in other industries could exacerbate competition for legal agricultural workers. Recession could make more workers available to agriculture.

IRCA’s effect on the farm labor market in California during the next few years will also depend much on (1) law enforcement by the Immigration and Naturalization Service and the U.S. Department of Labor, (2) administrative rules and calculations determining the number of RAWs to be legalized, and (3) general economic activity. Immigration reform has the potential to change the farm labor market significantly in the longer run—with consequences in terms of:

- farm workforce composition,
- mobility and occupational choice of legalized farm workers
- worker exercise of employee protections under the law,
- union organizing activity,
- pay and other terms of employment
- use of farm labor contractors, and
- technological change substituting machinery for labor.

This law alone could ultimately affect basic structure, crop mix, and viability of labor-intensive agriculture in California and the nation as a whole. More likely, it will interact with other factors stimulating business adjustments. In fact, the importation of products may greatly overshadow the immigration of workers as an influence on California agriculture.

## **Business Trends and the Dilemma of Cheap Labor**

The new immigration law joins other regulatory, technological, social, and market forces that have put pressure on the traditional agricultural labor market and are building the need for adjustments in farm production. Labor management decisions are influenced by several factors, on and off the farm: tradition, technology, managerial values and assumptions about workers, product as well as labor markets, financial situation of the firm, laws and regulations, and union contracts. These factors weigh in differently at different times, and they often have conflicting management implications. Those formerly most significant (tradition, management preferences, union contracts) have not remained so. Laws and regulations have become increasingly influential on labor management decisions.

Complicating the impact of all this, and of mounting significance, is globalization of product markets. Managers have had to shift attention from the pursuit of efficiency in a rather stable context to more strategic planning under conditions of flux and heightened competition. Fundamental choices about business line and location, market niche, and investment have come open for reconsideration. All have consequences for labor management.

National and state legislation during the past two decades has narrowed gaps between employee protections in the agricultural and nonfarm sectors. Developments applying to all industries have given employees more legal rights within their jobs, providing some of the benefits for which unions have traditionally bargained.<sup>2</sup> For employers these protections and accompanying paperwork have raised costs and risks of maintaining a directly hired workforce. Where competitive product markets give employers extra impetus to realize cost savings, a common adjustment has been to downsize and contract with outside providers for services that were once integrated within the organization (Belous, 1989).

The increased use this decade of farm labor contractors (FLCs) and management service companies is an expression of this trend in California agriculture. In 1988 the California EDD reported an 11 percent increase over 1987 in the number of agricultural laborers employed by farm labor contractors, citing this as the year's most significant change in the agricultural labor market. EDD data suggest that FLCs and management service companies were responsible for a majority of all fruit and vegetable work in the San Joaquin Valley during the third quarter (July-September) of 1987 (Villarejo, 1989).

One advantage growers commonly derive from contracting for labor is reduced cost—both from not having to carry underutilized human or physical assets and from sharing in any savings realized by FLC lowering of labor standards (e.g., offering less health insurance and other voluntary fringe benefits, or failing to cover employees with mandatory workers compensation and unemployment insurances) (Mines and Anzaldua, 1982). Wages paid by FLCs in 1983 were the lowest among all classifications of agricultural employers in California, averaging slightly less than 58 percent of the mean agricultural wage (Vandeman, 1988)

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<sup>2</sup>Such laws and regulations pertain to collective bargaining, recruitment and pay stub information, minimum wages and overtime premiums, unemployment insurance, workers compensation insurance, occupational safety and health.

Although cost reduction and removal of legal employer obligations motivate grower patronage of FLCs, so do broader business strategies. Advantages from contracting out for agricultural services, as in other industries, may take the forms of organizational flexibility to pursue new ventures or markets, ability to access a wider variety of specialized skills and equipment needed for a limited time, and concentration of core personnel on valuable functions that they perform best (Miles, 1989).

In nonfarm industries, recent years have brought departures from union-management arrangements that had been relatively stable since the mid-1950s. While the legal framework for union organizing and collective bargaining in California agriculture was not erected until some 40 years after the National Labor Relations Act (which specifically excluded farm employment), both farm and nonfarm unions have experienced loss of influence in the 1980s. In neither the primary nor secondary sectors do firms routinely accept pattern bargaining within an industry of long-term contracts with wage raises, automatic cost-of-living wage adjustments, bilaterally formulated work rules, extensive fringe benefits, and quasi-legal adjudication of workplace disputes as the price of stability, labor peace, and predictable costs.

The California Agricultural Labor Relations Act was enacted in 1975 to “. . . ensure peace in the agricultural fields by guaranteeing justice for all agricultural workers and stability in labor relations” (Agricultural Labor Relations Board, 1978). In the first six years under the act, from 1976 through 1981, 889 representation elections (average 148 per year) supervised by the ALRB resulted in 749 (84 percent) union certifications, and 14 decertification elections resulted in seven (50 percent) union losses. In 1983-88, the most recent six for which complete data are available, unions were certified in 74 (53 percent) of 140 representation elections (average 23 per year) and decertified by workers in 27 (61 percent) of 44 votes held.<sup>3</sup> As the numbers of union certifications and contracts have declined, so have indirect benefits derived by nonunionized workers from the threat of unionization.

Expansion of labor contracting, decertifications of unions, and closures of companies with union-influenced terms of employment may be traced to competition in the product and labor markets. In product markets, abundant domestic supply and increased production abroad have kept prices down and made cost control more critical to financial success. In labor markets, abundant supply has given farmers the opportunity—that many need—to hire people who will work for less.

However, cheap labor has a troublesome companion—belated innovation in production systems. Although extensive illegal immigration from Mexico has given California farmers a plentiful source of seasonal labor, it has also slowed progress in development of new machines, methods, and management practices that are needed for competitiveness in world markets (Martin and Olmstead, 1985). While fruit, vegetable, and horticultural specialty producers have been concerned about the availability of alien farm workers, other nations with even less expensive labor have been building farm sectors destined to increase their market share. The cost of broccoli production in Mexico during the 1986-87 season was but 40 percent of the California cost, in substantial part due to the typical Mexican farm wage of about \$3 per day (Cook and Amon,

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<sup>3</sup>Personal communication with Robert Dresser, Board Counsel, Office of the Executive Secretary, Agricultural Labor Relations Board, Sacramento, November 1989.

1988). Thus, near term labor market conditions obscure a plausible scenario of California labor-intensive crop sectors languishing for not having lowered or at least controlled costs through technological change.

The dilemma is that the same inexpensive labor that enables businesses to prosper today cannot over the long run be a competitive asset for California agriculture. Since other nations—and even other states—have lower labor standards, the California farmer would be better off with labor cost as small a factor as possible in the production equation. The longer we depend on cheap labor for agricultural production, the more vulnerable we are to foreign competition. Technologies that more fully leverage human work can reduce the labor cost disadvantage.

### **Conceiving the Future**

A viable California agriculture needs an adequate supply of employable, competent farm workers, located where and when work is to be performed. Costs in the production system should permit growers to remain competitive in world product markets. Wages and working conditions should enable more workers to live closer to the American mainstream in terms of income, social status, access to public institutions, and opportunities for occupation growth. Is this possible? Can we have both a better lot for farm workers and tolerable costs for farm operators? Not unless new technology and labor management practices increase productivity and reduce waste enough to preserve workable economic margins.

It is not certain that streams of immigrants and other disadvantaged workers will continue to offer ample labor for secondary farm jobs. Even if they do, patterns of demand for labor will likely have changed by the end of this decade. Related developments in production technology and the organization of work will shape tomorrow's patterns of aggregate need for workdays in agriculture and people to supply them. While some production systems may retain their basic processes, the context if not content of virtually every agricultural job will be altered in the coming years. Much of the workforce will have to be prepared to operate technologies different from today's.

Mechanization may be designed primarily to achieve private and social benefits other than reduction of labor requirements. It can help conserve soil, water, and energy; improve fertilizer placement; more efficiently apply pesticides; reduce damage to crops; and reduce worker exposure to hazards. Almost always, however, one of the important impacts of agricultural mechanization is to increase labor productivity. Farm production per work-hour in the United States increased nearly 800 percent—much more than in nonfarm industry—from 1944 to 1978 (Council for Agricultural Science and Technology, 1983).

Changes in the nature of jobs have accompanied reductions in labor intensiveness. Adoption of the mechanical cotton harvester, for example, nearly halved the labor bill in that commodity while saving producers 15 percent of their total operating costs from 1950 to 1970. Concurrent with a sharp reduction in total employment, the average wage for remaining cotton production jobs increased along with the levels of reliability and skill required. Agricultural mechanization in the future, supported by biotechnological developments, can be expected to similarly alter job numbers, types, and conditions. Replacement of strenuous harvest, cultivation, and carrying jobs

with machine operation, sorting, and maintenance work should, while reducing total employment, increase the proportion of the workforce who sustain longer careers in agriculture.

Machines can enhance the work of human minds as well as hands and backs. Microelectronics in information processing adds new dimensions to the potential for technological and organizational change. Engineers and manufacturers are developing a new generation of tools applicable to agriculture (*Agricultural Engineering*, 1989). Some of these devices provide assistance to an operator in monitoring machine functions to which adjustments must be made (e.g., seed drop sensors on planting machines that transmit information on seeding rate, acreage sown, and planter malfunctions; sensors that monitor speeds of fans and threshing cylinder shafts on combine harvesters). Some relieve the operator of routine decisions. Still others are capable of sensing product or environmental attributes that humans cannot and translating such information directly into continuous automatic adjustment of machines (e.g., the “laser plane” that precisely controls the cutting blade position on a soil scraper; tractor speed and load monitors that directly set gear and throttle for optimal fuel efficiency).

Developments in industrial robotic mechanisms are also being explored for possible adaptation to agriculture. Finer sensors and models, more versatile mechanisms, and smarter control systems could enable machines to take on more tasks that have heretofore required human observation, analysis, decision-making, and dexterity (e.g., harvesting oranges; gathering, sizing, inspecting for internal blood spots, and packing eggs; culling dried prunes for various defects). Near-term opportunities for such technological changes are probably greatest in post-harvest operations.

Partnerships among farmer-inventors, university engineers and extension staff, and manufacturers must be strengthened and exploited to turn such mechanical advances into competitive advantage for California agriculture. Economic benefits from technological change typically accrue to early adopters, until the new method becomes standard practice and producer competition passes the benefit on to consumers. If California producers lack the means or motivation to rapidly adopt new technology, they lose the opportunity to capture, even temporarily, any advantage from it. Moreover, innovations developed in California can even work against the industry here if applied more promptly elsewhere.

Microelectronics are also invaluable, of course, in the form of computers for handling administrative and management information. Substantial productivity gains may begin with better quality and reporting of data on such subjects as inventory, herd health, chemical applications, personnel skills and task preferences, crew performance, prior yields, costs, customers and so on. Access to such information enables the people whose hands are on plants, animals, or machines to make more and better decisions, thereby also reducing supervisory cost.

With or without technological change, organizational management can yield cost reduction and employment stability by either increasing productivity per worker or spreading the work over a longer time. Mutual employer-worker benefits are achievable through restructuring of work, clarification of job duties, systematic pre-employment screening for job-related knowledge and skill, investment in orientation and training, adroit supervision, rationalization of pay systems, and employee participation in decision making.

Employers are challenged to build organizations that facilitate the productive interaction of workers who have different languages and cultural frames of reference. Many rely on bilingual supervisors, such as foremen and FLCs who have long been key in seasonal farm labor markets. The selection, training, and performance appraisal of these cultural and hierarchical boundary-spanners merit more managerial attention than ever.

While laws of the state prescribe penalties for employer violations, less well codified laws of human and organizational behavior penalize careless labor managers with operational inefficiency. Casual patterns of personnel management in agriculture have provided fertile ground for the growth of real and perceived inequities. Conflicts result from such practices as hiring without clearly specifying job duties or presumed qualifications, setting wage rates through an uncoordinated series of individual negotiations, and allowing foremen or FLCs full discretion to recruit, assign work, discipline, discharge, and cope with problems. Workplace disagreements have escalated to wasteful litigation and physical violence. Farm managers can do better in managing labor. They will have to as advances in mechanization, automation, and biotechnology render each worker's performance more consequential and mistakes more costly.

While much technological change is anticipated, there will still be short-term, seasonal jobs in the agriculture of the new millennium. FLCs serve the economic function of reducing personnel transactions for growers. For some workers they also provide more continuous earning opportunity by stringing together a series of short-term jobs, although for others they provide but temporary employment in secondary jobs under miserable conditions. Such contingent employment, offered by FLCs or growers, while increasing flexibility, tends to reduce employer investment in human capital development. It also makes workers more economically insecure, especially with respect to benefits for which eligibility is a function of continuous employment. Employers with diversified operations, employer associations (especially those including multiple commodity growers), and the state job service may be able to facilitate labor market processes that supplement or substitute for the FLC function.

Agriculture should operate under laws that are comprehensible, internally consistent, and fairly applied. The legal environment could be better grounded in consensus principles about the value of domestic agriculture, the need for entrepreneurial risk and skillful management, and the essential contributions and dignity of those who work in the system. Much state and federal legislation has already been put on the books to address labor market dysfunctions and farm employment inequities, but it promises much more than it delivers.

In agriculture the employment of thousands of people not truly eligible to work in the United States is only one type of incongruity between public policy myth and field-level reality. After years of being excluded, most of California agriculture is now covered by wage and hour standards, child labor, social security, unemployment tax, health and safety, workers compensation, disability, and labor contractor regulation. Nevertheless, for example, some field workers still handle pesticides without wearing protective clothing; injuries go unreported despite their compensability under the workers compensation system; piece rate (and even hourly) earnings sometimes fall below the minimum wage standard; labor camps do not uniformly meet local health and safety codes; and FLCs, unregistered or registered, overcharge for transportation, drinks in the field, or other services.

Uneven compliance by employers may stem from either ignorance or willful disregard of applicable laws. The volume and complexity of legal mandates and prohibitions certainly contribute to the former. Partly responsible for the latter are some state-to-state regulatory differences (e.g., in union organizing protections, minimum wage, unemployment insurance) that are competitively disadvantageous to growers in California. Agricultural employers in this state, as well as workers in others, would benefit from federal legislation that makes the legal environment less of a national patchwork.

Compliance with public policy on farm employment is undermined when economic incentives to disregard the law are not neutralized by strong enforcement. Responsible watchdog agencies simply do not have adequate resources to cover their domains through routine inspection, especially given the wide dispersion in location, type of setting, and stability of agricultural workplaces. Effectiveness of most labor laws depends on the expectation of agency follow-through on employee complaints. Workers have an important role in enforcement, but their limited knowledge of applicable legal protections and whistle-blowing mechanisms restricts the effectiveness of the overall process. Regulatory and educational institutions could help reduce violations by getting more information about employment laws to sellers as well as buyers of labor (workers as well as employers).

### **Adjustments and Investments**

It behooves public policy makers and their constituents to recognize the external forces necessitating adjustment within the agricultural labor system and to work toward adaptive changes. The types of public and private investment prescribed in *California: Vision 2010* for the state in general are certainly appropriate for the agricultural community. Attention to infrastructure, human resources, and the legal environment is needed. Highest priorities include:

#### ***Infrastructure***

- Development of mechanical and biotechnical advances that increase overall production efficiency, provide greater leverage for human effort, and reduce hazards and seasonal shifts in agricultural employment. Incorporation of worker as well as grower knowledge and perspectives in design of new equipment.
- Support for timely trial and rapid adoption of new technologies, including applied research, extension education, and tax incentives. Vocational and social services to cushion technological displacement of workers.
- Improved facilitation of labor market processes that match supply and demand, especially for short-term jobs. Extensive use of computerized and other electronic (e.g., FAX) systems for giving workers and employers convenient access to real-time job information. Public collection and distribution of reference information on prevailing wages and benefits.

- Housing for workers who perform jobs that still necessitate migration from home. Public facilities, if policies to encourage private operation of worker housing are not effective.
- Portable fringe benefit programs that enable workers to accumulate and carry eligibility credits from seasonal job to job within a given agricultural sector. Incentives for employer groups to provide continuous benefits within a region.

### ***Human Resources***

- Management education for farm operators and labor contractors, to enable more of them to structure and lead organizations that attract, retain, and elicit a high standard of performance from well qualified employees. Special attention to selection and development of first-line supervisors and other boundary spanners within agricultural businesses.
- Research on design of jobs that better utilize employee intelligence and knowledge and that bring a fuller range of employee assets into work process adjustments and other management decisions.
- Better public education at the primary and secondary levels, providing more of our population with the fundamental cognitive and communication skills required by jobs in a more technologically sophisticated agriculture. Integration of second language instruction and intercultural awareness material into curricula.
- Continuing education and on-the-job training for agricultural workers who can extend their skills to fit higher level or newly emerging jobs; training and out-placement counseling for those who cannot.

### ***Legal Environment***

- Increased public analysis and discourse on agricultural labor issues, particularly including criteria for weighing the benefits and costs of labor-intensive technologies. Attempts to develop consensus on how to distribute costs of reducing labor market dysfunctions.
- Promotion of federal legislation establishing more uniform labor regulation and standards across states.
- Strengthened efforts to clarify, publicize, and enforce existing laws that either directly regulate terms of employment or affect aggregate labor supply and demand.

### **Conclusion**

Agricultural producers have a history of achieving increased output quantity and better quality from the same human effort or input dollar. Innovations in technology, work organization, job design, recruitment, selection, supervision, training, compensation, dispute handling, and employee involvement in decision making have contributed to these results, though not as much

as they might have and not without contention. In the coming decades California farmers will need to innovate more.

Policy on labor-related issues will help to mold future behavior of farm employers and workers, and ultimately the structure of California agriculture. Public and private choices will determine how separate the primary and secondary labor markets remain, how the costs of technological and structural change are distributed, and how effectively the state's food and fiber system can produce. Although public policy will have to accommodate some divergent goals of competing interests, its efficacy will be demonstrated more by the welfare of the agricultural community as whole than the success of any of its parts.

It is neither accurate nor helpful to construe labor issues simply in terms of conflict between owners of capital and providers of labor. While some absolute differences of interest between employee, employer, and public groups require "distributive" resolution, many issues present opportunities for "integrative" decision making. Competitive pressures and narrowed margins have brought growing numbers of managers and workers to realize a shared interest in business efficiency. The squandering of materials, market opportunities, technological advances, human skills and spirits can only harm profits, jobs, and consumer budgets in the long run. Whether unilaterally designed or bilaterally negotiated, organizational structure and processes can render labor—and the entire system—more effective. Intelligent theories of business and worker behavior are needed to guide decisions that will work for the many.

The general public has a natural stake in the welfare of the food system as a whole, the businesses that comprise it, and the workers who make it run. The prevailing mix of public values, however, holds somewhat inconsistent implications for policy. Many consumers who enjoy their access to reasonably priced food and who favor unregulated markets for products and labor also want better incomes and working conditions for farm workers. Achievement of the latter may compromise the former, unless productivity is improved.

Viability of California agricultural industry and of the units within it is ever more sensitive to technology, workforce performance, and the management of human resources. The common challenge for public and management policy is to build socio-technical systems that are both highly productive and personally rewarding.

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