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THE OCCUPATIONAL HEALTH STATUS OF HIRED FARM WORKERS

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HIRED FARM WORKERS, A SPECIAL POPULATION

The agricultural industry employs some 2.5 million persons as hired farm workers.[21] Hired farm work is a United States Census–defined occupation referring to persons employed to perform on-farm tasks for the purpose of producing an agricultural commodity for sale. In the past 20 years, labor-intensive agriculture and a corresponding demand for workers have increased significantly, associated with an increase by two-thirds in annual U.S. production of fruits and vegetables (millions of tons harvested).[90] Nonetheless, all but a relatively few hired farm workers are employed on a seasonal basis, which means that some work in nonagricultural jobs for part of the year, some migrate among agricultural regions of the U.S., and others are unemployed or return to their home country between seasons.

In this review we consider only hired crop farm workers. There are two reasons for the exclusion of hired livestock farm workers. First, occupational injury and illness among livestock workers (mostly farm operators and unpaid family members) have been extensively studied. Second, most hired farm workers are employed in crop agriculture; about 70% of all hired and contract labor expense is associated with crop agriculture, according to the *1992 Census of Agriculture*.

Although knowledge about hired farm workers is incomplete, the available evidence indicates that they comprise a special population with regard to occupational health. The demographic and employment characteristics of hired farm workers clearly distinguish this labor force from

nearly every other occupational category. According to the U.S. Department of Labor's National Agricultural Workers Survey (NAWS), the hired crop farm labor force is characterized by the following[85]:

- About 69% are foreign-born, mostly from Mexico and Central America, and this figure has sharply increased in recent years.
- Many workers speak only Spanish.
- An estimated one in three is undocumented, not authorized to work in the U.S.
- Most hired farm workers are young men.
- Four of ten migrate across national or state borders to find work.
- Educational attainment is low, an average of 6 years of formal education.
- About one in four works for a labor market intermediary, usually a labor contractor.
- As few as 1% of U.S. farm workers are represented by labor unions.
- Three-fifths earn so little that they and their families live in poverty.

Each of these features plays a significant role in determining the occupational health status of the population as well as our ability to gain insight regarding their health status.

Foreign-Born

Today, more than two-thirds of hired crop farm workers are foreign-born. Some 94% of these are Mexican nationals, but significant numbers come to the U.S. from Central America or from the Caribbean. Since most hired farm workers speak only Spanish, communication between practitioners and patients can be problematic. Other languages encountered in this population include Haitian Creole and several indigenous dialects, such as Mixteco. A survey of 19 labor camps in San Diego County, California, found that 40% of the residents spoke one or another of fourteen different indigenous dialects.[97] Access to fully bilingual and biliterate staff is essential for agencies serving hired farm workers. Recently, the number of indigenous peoples from Southern Mexico and Guatemala working in U.S. agriculture has substantially increased.[96,97] Most of the latter are Mixtec, Zapotec, or Maya, from southern Mexico and Guatemala.

Less well understood is that the foreign-born share of the national total of hired farm workers increased sharply during the past several decades, in part driven by push factors such as economic crises in Mexico and civil wars in El Salvador, Guatemala, and Nicaragua. In less than a decade, from 1989 to 1995, the foreign-born share grew from about 60% to 69% of the national total.[85] Although pre-1988 data for the nation are not available, in California—where an estimated 700,000 persons work as hired farm workers—the foreign-born share increased from 50% in 1967 to 92% by 1990.[85]

The Mexicanization of the U.S. hired farm work force is one of the most significant developments of recent decades. Even regions and crops where African-American or non-Hispanic white persons once comprised the largest portion of the labor force have witnessed a gradual process of ethnic replacement in which Mexicans have become the dominant group. For example, a generation ago, African-American families were predominant in the North Carolina tobacco harvest. Today, young Mexican men are the majority in this crop. Similarly, in Florida, foreign-born Latino or Mexican men have largely replaced U.S.-born African-Americans.[21]

The health status implications of this major demographic shift are considerable. Health and suitable treatments of adverse health outcomes may be viewed very differently in the various cultures found among foreign-born hired farm workers.[5] Knowledge about and sensitivity to these cultural values may determine success or

failure of a prescribed treatment. In some cultures, Western medical practices are just one approach and may be of secondary importance to traditional healing practices.

Unauthorized To Work in the U.S.

In spite of U.S. agriculture's unprecedented dependence on foreign-born hired farm workers, lawmakers and agencies have been unable to reconcile this dependence with immigration policy. In 1995, about 37% of hired crop farm workers indicated that they lacked work authorization from immigration authorities, a dramatic change from 1989 when as little as 7% were undocumented.[85] This sharp increase is largely due to the conflicting provisions of the Immigration Reform and Control Act of 1986 (IRCA). Under the Special Agricultural Worker visa, one of the IRCA's legalization programs, 1.1 million undocumented persons who had worked in agriculture for at least 90 days between May 1985 and May 1986 became legal permanent residents.[21] However, poor enforcement of the employer sanctions for hiring undocumented workers has permitted this new rise in the number of unauthorized workers in U.S. agriculture.

Today, U.S. immigration policy places a high priority on border enforcement and, increasingly, on the removal of unauthorized workers from the nation's interior. As a consequence, nearly all undocumented hired farm workers are fearful of interacting with government officials: they refrain from reporting occupational injuries to government agencies and do not seek medical assistance from government-supported service providers.

Young and Male

The predominance of young males among this labor force (four of five hired crop farm workers are male; average age is about 32) has several implications for the study of occupational disease. Most workers are healthy, vigorous, and in excellent physical condition. They also exhibit a much lower incidence of tobacco use than is found among workers in other demographic groups.[80] Together with the high rate of worker turnover, these qualities make it more difficult to study some types of injury and illness in this population (e.g., chronic adverse health outcomes).

Migrating for Work

An estimated four of ten hired crop farm workers migrate to find employment. About 75% of these are "shuttle migrants," traveling between a home village and a specific U.S destination to seek seasonal employment in agriculture. Some 25% of those who migrate, or one in ten of all hired crop farm workers, are "follow-the-crop migrants".[62]

These estimates of migrant status are national averages. In some communities, the entire hired farm work force may migrate, while in other communities only a few travel to find work. Since migration patterns are determined by an economic survival imperative, health care issues, including seeking care for occupational injuries or illnesses, may become secondary.

Uneducated

The average educational attainment of foreign-born hired crop farm workers is 6 years of formal education. An estimated two-thirds of the foreign-born crop labor force in California is functionally illiterate, even in their native language.[85] This factor limits communication, both in vocabulary and in the degree to which written instructions can be relied upon for treatment or preventive purposes. Some agencies

rely on popular education methods as the most reliable form of communication, in which informal, participatory interactions between health educators and hired farm workers largely replace written materials.

Cultural factors, in which concepts have one meaning in English, but possibly denote a different concept in Spanish, can sometimes lead to confusion. For example, pesticides are viewed by many recent Mexican immigrants as *medicinas para las plantas* (literally, medicines for the plants). Thus, education about the potential hazards of pesticide use is especially important.

Living in Poverty

According to NAWS, in 1995 over three-fifths of the hired farm worker population lived below the poverty line; in 1990, only half were living in poverty. From the point of view of public health, it is widely understood that socioeconomic status is the single most important factor in determining health outcomes. Within a household, priority likely is given to basic economic needs as opposed to what may be regarded as discretionary expenditures, such as preventive care. In the city of McFarland, California, a small community composed mostly of hired farm workers and family members, state health officials found that more than two-thirds of children under the age of 15 required a medical referral, mostly owing to the absence of routine preventive care.[76]

Though some providers might assume that the failure of a hired farm worker to seek treatment reflects ignorance, economic factors may be determinative. Even though most would qualify for Medicaid based on household income, just 15% reported receiving this social insurance benefit. Thus, health care services typically are sought only when essential and are obtained from many sources, most often a pharmacist.[61] Workers may perform an informal "risk calculus" in which the expense of obtaining health care is weighed against opportunity costs to the household, including wages that might be lost while seeking and obtaining treatment.

LABOR MARKET INTERMEDIARIES

In the past decade, labor contractors have become more important as employers of hired crop farm workers. Labor contractors recruit, hire, train, supervise, and dismiss crews of workers who are furnished to farm operators on an as-needed basis. Nationally, at least one of four hired crop farm workers is now employed in this fashion rather than working directly for a farm operator. One of three California hired farm workers reportedly is employed by at least one contractor in the course of a year.[14]

By utilizing labor contractors, farm owners can avoid dealing directly with certain regulatory and immigration issues that often raise management costs. More importantly, labor contractors provide cultural mediation between the largely foreign-born hired farm workers and the farm owners and operators, most of whom are non-Hispanic, white males with, at best, limited proficiency in Spanish and relatively little knowledge of Mexican or Latino culture.

This Mexicanization of the U.S. hired farm labor force has brought with it significant changes in management practices, such as the emergence of the crew system. Similar to the system in Mexico, a *majordomo* (foreman) recruits, hires, and supervises a crew of workers intact for the entire season. A labor contractor, who hires the crew and its foreman, arranges a succession of jobs with different farm operators. Large-scale labor contractors hire as many as several dozen crews. In many cases, the contractor provides housing and transportation, as well as arranges jobs,

provides loans, and assists with immigration matters. But the foreman directly hires and supervises members of the crew. Familiar with Mexican or latino cultural norms, the crew leader sometimes hires extended family members or persons from his or her home village. Loyalty and the mutual exchange of favors solidify the employment relationship in a manner that is impossible for most farm operators.

Finally, labor contractors often pay lower wages than would be available to persons who are directly hired by farm operators.[14] Thus, labor expenses for the farm operator may actually be lower than if the crew were directly hired. Even though his or her profit margin may be low, the contractor can derive off-the-books income in a variety of ways. These methods include charging a cash fee for providing rides to and from jobs, renting needed tools to crew members, and, in some cases, assisting workers with immigration problems for a fee. A statewide survey of farm labor contractors in California found that none offered their employees such modest benefits as health insurance or paid vacation.[14]

Under the crew system, the foreman is the central person. In most cases, a worker does not report occupational injuries or illnesses, or labor law violation, to the proper authorities without the consent of the foreman. And interviews with workers are granted only with the permission of the crew leader.

Not only do labor contractors and crew leaders extract payments from hired farm workers, but they also may place their crew at risk of injury. A system of *raiteros* (drivers of vans or small trucks) has developed in California under which a worker pays the crew leader, or his or her designate, for transportation to and from the job. Typically, a small panel van holds up to 20 workers, drinking water, lunches, jackets, and tools. Cash payments of $3 to $5 per day for each worker are demanded, often as a condition of employment. This practice is illegal.

Multi-fatality accidents involving *raiteros* in Fresno and Madera Counties in Central California reportedly killed 29 workers in just a 2-year period.[79] Although not occurring at the work site, these accidents were clearly associated with job requirements imposed on the victims by their employer. For this reason we consider them to be nonenumerated occupational fatalities.

LABOR UNION CONTRACTS

Estimates of the extent of labor union representation of hired farm workers are difficult to find in the literature. The data available suggest few hired farm workers have the protections afforded by labor union representation. Thus, this labor force is especially vulnerable to adverse conditions of employment.

The United Farm Workers of America (AFL-CIO) claims a membership of 26,000, but this figure includes associate members, who are not part of collective bargaining agreements. The International Brotherhood of Teamsters, Local 890 (Salinas, California), represents at least 6000 hired crop farm workers under union contract, as does the Farm Labor Organizing Committee (Toledo, Ohio). Other smaller unions may represent as many as 5000 additional hired farm workers. Taking these estimates into account, today there are at most 45,000 workers who are members of farm labor unions, and very likely fewer than 30,000 of these are represented in union contracts with management.

We estimate 1–2% of all hired crop farm workers are protected by a labor union contract. While those who work under collective bargaining agreements almost always have employer-provided health insurance, the extremely low rate of union penetration in this industry indicates that organized labor is a relatively small factor in workplace safety.

HIRED FARM WORKER ACCESS TO HEALTH CARE SERVICES

Employer-Provided Health Insurance

There is a paucity of information about health insurance coverage of hired farm workers. On a national basis, insurance industry sources estimate that 40% lack health insurance, the highest for any occupational category. However, careful review of these data shows that the figure refers to coverage among regular, year-round employees. Industry sources do not provide data regarding health insurance status for workers who are employed in seasonal jobs.

The NAWS findings indicate that 10% of U.S. hired farm workers have some form of health insurance through their employer.[62] However, since some workers may confuse workers' compensation insurance with general health insurance, the figure may be unreliable. The U.S. Department of Agriculture (USDA) survey of farm operators finds that just 11% of all U.S. workers hired directly by farm operators receive benefits such as life or health insurance or transportation from their employer.[84]

Surveys of employers conducted by the Farm Employers Labor Service (FELS) in California indicate that about 60% of employers provide health insurance for their regular, year-round employees.[32] The same survey indicates that only about 13% of these same employers provide health insurance for seasonal employees. Most of the employer respondents to the FELS survey are farm operators, so the data probably do not reflect conditions among employees of farm labor contractors. The most recent survey data among this category of employers found that only 3% of labor contractors in the state provided health insurance for their employees.[13]

Taken together, the data on farm operators and farm labor contractors suggest that few seasonally-employed farm workers have employer-provided health insurance. Consequently, many do not seek health care, and others apply for Medicaid coverage, go to migrant clinics, or turn to emergency services. Though the evidence is not very comprehensive, it appears that most hired farm workers do not obtain regular health care services and seek services only when absolutely necessary.

Federally-Funded Programs

Under the Migrant Health Act of 1962, the Federal Government provides support to over 120 community-based and state organizations that offer comprehensive primary care services to address the unique needs of hired farm workers. Nevertheless, this network of clinics provides services to only about 15–20% of the eligible population.[28,29]

Although many hired farm workers readily qualify for Medicaid owing to their low earned income, many do not apply or are disqualified because of their immigration status or because they do not meet the 45-day residency requirement imposed in many states. Among hired farm workers who are either citizens or work-authorized, it has been estimated that only 20% use Medicaid. Of those with children under age 15, only 35% use Medicaid.[2,38,86]

REGULATION OF THE FARM WORK PLACE

The agricultural industry enjoys special exemptions from many federal regulations that no other industry has obtained, a concept sometimes described as **agricultural exceptionalism**. Federal laws supposedly govern all workplaces, including farms. From minimum wage rates to employment of children to occupational safety regulations, agricultural employers are subject to restrictions. However, in several

TABLE 1. Workers' Compensation, Coverage of Hired Farm Workers by State

Complete Coverage	Partial Coverage, Employer Exemptions	Partial Coverage for Injuries, No Coverage for Illnesses	No Coverage
Arizona	Alaska	Pennsylvania	Alabama
California	Florida	Utah	Arkansas
Colorado	Illinois		Delaware
Connecticut	Iowa		Georgia
Hawaii	Kansas		Indiana
Idaho	Maine		Kentucky
Louisiana	Maryland		Mississippi
Massachusetts	Michigan		Missouri
Montana	Minnesota		Nevada
New Hampshire	New York		New Mexico
New Jersey	North Carolina		Nebraska
Ohio	Oklahoma		North Dakota
Oregon	Texas		Rhode Island
Washington	Vermont		South Carolina
	West Virginia		South Dakota
	Wisconsin		Tennessee
			Virginia
			Wyoming

important instances, federal law treats hired farm workers differently than employees in other industries and exempts significant categories of farm employers from any regulation at all.

One method for providing compensation for medical care and indemnity for lost wages or disabilities caused by job-related illnesses and injuries is workers' compensation insurance. Employers pay premiums for annual coverage under this type of insurance. Fourteen states require employers to provide universal workers' compensation insurance coverage for all workers, including agricultural workers. In the remaining 36 states, state law does not require workers' compensation insurance coverage for agricultural workers (Table 1).* Significantly, many agricultural workers are unaware of this type of insurance even in states where it is required by law, such as in California.

The workers' compensation system has additional defects with respect to agricultural workers: (1) A claim must be initiated by the injured employee, which may be problematic for some hired farm workers. (2) Chronic injuries, such as back problems, may be difficult to associate with a specific employer. (3) Employers may challenge any claim in an adversarial process through a quasi-judicial claims appeals board. Many hired farm workers lack the resources to pursue such a challenge.

Fair Labor Standards Act of 1938 (FLSA)

This important federal law governs workplace standards, such as minimum wage rates, hours, pay for overtime work, employment of children, and related matters. The Wage and Hour Division of the U.S. Department of Labor is responsible for enforcement. However, there are extremely important exemptions enjoyed by

* For a complete breakdown of the individual state requirements for agriculture with respect to workers' compensation insurance see Craddock BR (ed): *Federal and State Employment Standards and U.S. Farm Labor: A Reference Guide to Labor Protective Laws and Their Applicability in the Agricultural Workplace*. Austin, Texas, Motivation, Education, & Training, 1988.

agricultural employers as compared to other industries. For example, although FLSA requires overtime pay for all hours worked each week in excess of 40, agricultural employers are completely exempted from this provision. Similarly, children under the age of 14 may not be employed in any industry, except in agriculture, where the minimum age is 12. Moreover, restrictions on the employment of children in dangerous work environments are less stringent for agriculture than for all other industries. FLSA provides no protection for nonworking children who may be present in agricultural fields. An unknown number of small children accompany their parents when they are working, mostly because of the lack of child care.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

This federal law governs agricultural pesticides used for commercial production purposes and includes provisions for worker health and safety. Until recently, most of the regulations under FIFRA dealt with registration of chemicals for use, certification of applicators, and record-keeping. However, the Worker Protection Standard (WPS), intended to address the health and safety of hired farm workers who experience on-the-job exposure, was introduced in 1991 and fully implemented several years later. Under WPS, employers are required to provide safety training for field workers who may be incidentally exposed to certain dangerous materials, maintain safe re-entry intervals before workers are allowed to enter treated fields, and provide safety equipment when conditions warrant its use. The U.S. Environmental Protection Agency (EPA) is responsible for enforcement.

Migrant and Seasonal Agricultural Worker Protection Act (MSAWPA)

This federal law governs the recruitment, hiring, and providing of certain services to hired farm workers by farm labor contractors and crew leaders. The Wage and Hour Division of the U.S. Department of Labor is responsible for enforcement. Under this law, a contractor or crew leader must be registered with the Department of Labor, disclose terms and conditions of employment before hiring, post notices of worker rights under MSAWPA, and keep accurate payroll records. Often, a labor contractor provides one or more services, such as housing or transportation, to employees. This law requires that motor vehicle safety and housing standards be met.

Occupational Safety and Health Act of 1970 (OSHA)

This federal law requires employers to furnish their employees with employment and a workplace free from recognized hazards that cause, or could cause death, harm, or serious injury. The Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, is the primary enforcement agency. In addition, standards promulgated under the law require agricultural employers who provide a temporary labor camp to comply with specific provisions covering the location and construction of such housing and the facilities provided therein. The Wage and Hour Division of the U.S. Department of Labor has responsibility for field sanitation standards (the availability of toilets, drinking water, and hand washing facilities at field work sites). A special provision in the annual appropriations bill for the U.S. Department of Labor exempts any farm employer with fewer than 11 employees in a given year from federal OSHA regulation, except if the employer operates a temporary labor camp or if an on-the-job fatality occurs.

States are allowed to assume responsibility for occupational safety and health enforcement by submission of an acceptable state plan to OSHA, but just 21 have done so, and two others have plans covering only public workplaces. Some states

have requirements more stringent than the federal regulations; for example, California imposes safety standards on all farms irrespective of the number of employees.

SOURCES OF DATA ON THE HIRED FARM WORKER POPULATION

Epidemiology of occupationally-related health outcomes relies on the ability to precisely link specific outcomes to workplace exposures. Since most farm jobs are seasonal, in some cases lasting only a few weeks, under the best of conditions it is very difficult to retrospectively determine specific workplace exposures experienced by an individual. Moreover, most workers find employment in a succession of different jobs over the course of a single year, further compounding the difficulty of associating specific exposures with occupational disease. Finally, many workers are resident in a specific community for only the short period of time that work is available, making prospective monitoring especially difficult. Nevertheless, promising new methods that have been developed to study the hired farm worker population may significantly advance the ability of epidemiology to provide information about this group's occupational diseases.

New Method of Collection

For decades, knowledge of the hired farm worker population was largely determined by reports from secondary sources and was quite limited in scope.[51] Information usually was obtained from analyses of administrative data required of employers in all industries under federal or state laws, or from surveys of agricultural employers. As implied from the preceding overview of characteristics of the hired farm worker population, agricultural employers are relatively easier to identify and contact than are their employees. However, reports from employers normally do not include demographic information about employees nor information on occupational injuries or illnesses.

USDA's *Hired Farm Work Force* report (discontinued after 1987) relied on the U.S. Census Bureau's Current Population Survey (CPS), a national sample of households identified in the decennial census. While this approach gathered information directly from hired farm workers, the sample was not accurately representative because most hired farm worker households tended to be missed in the Census Bureau's decennial enumeration. They also are missed in subsequent updates that serve as the basis for the CPS.[80]

In recent years, a fundamentally new approach has been developed. It relies on experienced interviewers, typically native speakers of the subjects' preferred language who are bilingual and biliterate, to conduct in-person interviews with hired farm workers. In this manner, researchers have managed to overcome many of the cultural, lingual, and literacy barriers previously separating them from the hired farm worker community. The method for selection involves a multistage sampling strategy designed to randomly select hired farm worker households from the universe of this population. The primary sample frame is either an enumeration of all places where hired farm workers are employed (farms), irrespective of whether the employer is a farm operator or a labor contractor, or all places where they reside (households).

The Department of Labor's National Agricultural Workers Survey (NAWS) exemplifies this new technique. This survey enumerates all farms and then randomly selects a sample, thereby giving every farm worker who is employed at the time of the survey a known chance of being selected. Once chosen, the subject is interviewed

(usually at home), and a full enumeration of all the household members is completed. Since its inception in 1987, NAWS annually has gathered important information from a national sample of 2500 hired farmworker households. Although expensive, NAWS has compiled an extensive body of data on the employment conditions, job history, demographics, and migratory patterns of hired farm workers.

Workers' Compensation Insurance Case Reports

Reports of occupational injuries and illnesses under this system are required as a part of the process of filing a claim. Employers and physicians are asked to submit detailed information about the incident, including the employer's industry code (SIC), risk classification, nature of accident, type of injury, body part affected, gender and age of the claimant, and information about the medical and indemnity costs incurred. Analysis of claims data provides useful and detailed information about frequencies and incidence rates of illnesses and injuries by type of risk classification (for further details see Reference 89).

Recently, the Bureau of Labor Statistics (BLS) instituted a survey of employers, including agricultural employers, to provide industry-specific national and state data on occupational injuries.[86] Agricultural employers with fewer than 11 employees are excluded from this survey as a result of the aforementioned Congressional limit imposed on OSHA.

OCCUPATIONAL HEALTH STATUS OF HIRED FARM WORKERS

A number of excellent review articles have examined the literature on the health and safety of the hired farm labor force[25,29,56,63,64,71,75,78,87,95] and have drawn the same conclusion: while hired farm laborers face a number of potentially significant safety and health risks, there are major gaps in existing research covering this occupational group. These reviews point to the challenges researchers face in studying this population. Under-reporting of medical conditions is significant due to hired farm workers' limited access to health services as well as to different cultural conceptions of health and disease. The migration of workers across state and national borders and between a variety of different crops also creates challenges for quantification of their occupational exposures. Most of the existing literature comes from cross-sectional studies of specific farmworker communities. Moreover, the creation of quality surveillance systems to measure occupational safety and health risks has been compromised by these factors.

As part of its congressionally mandated agricultural safety and health initiative, in spring of 1995 NIOSH organized a national advisory group comprised of clinical, research, and policy experts to provide advice and direction on occupational health surveillance of farm workers. One key component of this panel's activities was to generate and rank disorders common to farm workers for surveillance (Table 2).

PRIORITY HEALTH OUTCOMES FOR FARM WORKER SURVEILLANCE

Musculoskeletal Conditions

Agricultural work poses a number of well-recognized risk factors for musculoskeletal disorders, including repetitive lifting, bending, and stooping; working with arms above shoulder level; and repetitive movements of the hands and wrists in hand-intensive field work.[64] Additionally, according to NAWS, 23% of farm workers

TABLE 2. Priority Occupational Health Outcomes for Hired Farm Workers

Musculoskeletal disorders	Infectious diseases
Pesticide-related conditions	Cancer
Traumatic injuries	Eye conditions
Respiratory conditions	Mental health disorders
Dermatitis	

From NIOSH Workgroup on Priorities for Farmworker Occupational Health Surveillance and Research: New Directions in the Surveillance of Hired Farm Worker Health and Occupational Safety. Cincinnati, OH, NIOSH, May 5, 1995.

were paid on a piece-rate scheme between 1993 and 1996, providing a strong incentive to maintain a rapid, sustained work pace.[85]

Studies of the general health of hired farm workers have found that back complaints and other musculoskeletal pain are among the most common health problems reported by farm workers.[61,64,95] In 1996, 34% of lost-time injuries were sprains and strains and 24% were back injuries.[9] A recent study of 200 disabled adults found that back and other musculoskeletal conditions were the top two causes of disability—22.5% and 12.7%, respectively—among these farm workers.[83]

Although musculoskeletal complaints are common and were given top priority by the NIOSH panel, there have been remarkably few published studies quantifying the risk factors and examining the efficacy of ergonomic interventions. In 1993, in response to a cluster of cases of tendinitis among rakers working in the blueberry harvest in Maine, NIOSH conducted an ergonomic evaluation of this job. The investigators found that the raking task was highly repetitive, required high force levels and was associated with extreme radial and ulnar wrist deviations. They also documented a sustained stooping posture and lifting requirements that exceeded the limits suggested by the NIOSH Lifting Equation. Questionnaire data found high incidences of musculoskeletal pain that began after the initiation of blueberry raking tasks: back 27%, hand-wrist 20%, and elbow 11%.[31]

In 1996, NIOSH funded seven 3-year intervention studies under a new program entitled Community Partners for Healthy Farming. Three of the projects involve the development of ergonomic interventions, and one has recently published the first results of studies in the outdoor bedding and ornamental nursery industry in California. The first phase of the project was to identify priority tasks for ergonomic intervention. The researchers used a combination of grower interviews, ergonomic assessments, and a review of injury and illness logs to examine stooping, lifting and carrying loads, and repetitive hand work. The second phase, which will focus on these prioritized tasks, will evaluate the prevalence of musculoskeletal disorders, conduct an indepth ergonomic evaluation, and develop and evaluate ergonomic interventions.[45,60]

Pesticide-Related Illness

Pesticide-related illness refers to a broad group of health outcomes that have significant overlap with several of the other priority outcome categories, including dermatitis, cancer, eye injuries, and respiratory diseases. A number of excellent articles and chapters have exhaustively reviewed the toxicology, exposure assessment, and human health effects of pesticides, including a recent edition of this journal.[47] However, few studies have been directed at the hired farmworker population.[65] A 1994 Government Accounting Office (GAO) study to determine the nature and extent of illness associated with occupational exposure to pesticides on farms concluded

that there was no capability for accurate assessment. California is the only state that enforces a mandatory physician-based reporting system for occupational pesticide intoxications.[88] California averaged about 1500 reports of pesticide intoxication per year between 1982 and 1993; 41% occurred in agricultural workers, including farm owners and farm workers. For the purposes of California-EPA reporting, "agricultural workers" refers to those engaged in cannery, food processing, and other postharvest activities, as well as farm workers. Of all the reported cases, 48% involved systemic effects, while the rest were localized symptoms involving either the skin or eyes.[8]

Occupational pesticide exposure is unique in that it is the only occupational exposure that is entirely regulated by the EPA. In 1992, the EPA promulgated the Worker Protection Standard, which was fully implemented in 1995. It significantly improved the requirements for protection of agricultural workers through mandatory training programs, enforcement of pesticide re-entry intervals, and provision of decontamination washing facilities. Between 1992 and 1996, about 19% of all hired crop farm workers had mixed or applied pesticides in the past 5 years: 50% of all workers reported receiving some instruction regarding pesticides, and 79% of those who mix or apply pesticides received some instruction. Of those who mix or apply pesticides, only 30% can read English well, which underscores the importance of training programs and of labeling information in the workers' native language.[62,86]

A recent report in a California county with relatively low pesticide use used focus groups to provide some insight into hired farm worker attitudes regarding pesticide exposure. The risks posed by pesticide exposure were not mentioned as a major concern by the farm workers because: (1) they accepted the risks as part of their work environment; (2) they believed they had no control over pesticide exposure; and (3) they assumed there was no choice, if they wanted to continue working. The workers reported that safety standards varied considerably, but that some farmers provided high levels of training on how to avoid the risks of pesticide exposure. They also stated that if they did witness some anomalies in the use of pesticides, they would not report it for fear of dismissal.[2]

Due to the challenges of studying hired farm workers, most indepth pesticide research studies have focused on other pesticide-exposed populations. Much of the research specific to hired farmworkers has centered on evaluating levels of cholinesterase depression, because of the widespread use and well-documented health effects of the organophosphate and carbamate pesticides, as well as the availability of simple field test kits for cholinesterase levels. In North Carolina, the largest such study included 202 farm workers and 42 nonfarm workers from the same community and documented significant cholinesterase depression in farm workers. Additionally, those farm workers who applied pesticides had significantly lower levels compared to other farm workers. The only symptom associated with depressed cholinesterase was diarrhea.[16] A related focus has been on the documentation of chronic neurologic sequelae, and while there is some evidence of neurobehavioral effects in those workers with a documented history of acute organophosphate poisoning, this has not been shown in agricultural pesticide applicators with no evidence of overexposure.[27,46,82]

Traumatic Injuries

Agriculture is considered one of the most hazardous industries for occupational injuries and deaths.[57,59,77] In 1996, there were 335 occupational fatalities (31.3 deaths/100,000 workers) in agricultural crop production, including both farm

owners and farm workers. This is a higher rate than any other industry sector apart from coal mining and fishing.[9] One study attempted to differentiate farm owner from farm worker deaths and found that the crude fatality rate for farm owners was 38/100,000 worker-year and for farm laborers was 16/100,000 worker-year during 1977–1991 in North Carolina. Tractors accounted for 37% of the farm labor fatalities and 59% of farmers' fatalities. Over the period of the study, there was an estimated 3% per year increase in the fatality rate for farm laborers.[70]

NIOSH, in conjunction with the USDA, conducted the Traumatic Injury Surveillance of Farmers survey. Questionnaires were mailed to a sample of 25,200 farm operators selected from all agricultural production farm operations. The survey estimated, from farm owner reports, the number of injuries associated with farm activities that resulted in at least a half day of restricted activity for farm owners, unpaid family members, or hired farm workers. Hispanic workers probably provide the best information regarding injuries for the hired crop worker population, because 93% were classified as hired labor. The national estimates using these data projected 43,742 injuries in 1993 in Hispanic hired farm workers; 40% of these injuries were in workers under 30 years old. Unlike the mortality data, tractors were responsible for only 5.5% of all the injuries and 2.2% of those in Hispanic workers. The most common activities associated with injuries in Hispanics were field work (39%), farm maintenance (16%), and crop handling (13%). The most common types of injuries were sprains/strains (43%), cuts (16%), and bruises (14%); the most common locations were back/trunk/chest (39%), hand (20%), and arm/shoulder (8%).[67]

Despite the clear demonstration of a problem from the official statistics, significant under-reporting of work-related injuries occurs due to lack of mandatory workers' compensation coverage for many agricultural workers combined with their fear of lost wages. A study in North Carolina—a state that does not have comprehensive workers' compensation for farm workers—attempted to quantify this under-reporting. Of 287 workers, 24 (8.4%) reported an injury at work in the previous 3 years. Of the 17 injured workers who considered medical attention necessary, 41% did not receive medical attention within 24 hours, and 24% never received attention. Crew leader refusal or lack of transportation was given as the reason why 24% did not receive care and why 42% did not keep their follow-up appointment. The grower or crew leader covered the medical expenses for only 38% of the injuries.[17]

Nonmalignant, Noninfectious Respiratory Diseases

Agricultural workers are exposed to a wide variety of biologic and physical agents whose association with nonmalignant, noninfectious respiratory diseases has been well documented and reviewed elsewhere.[74] Associations have been found between obstructive disease and livestock confinement and grain handling/storage workers, asthma and a variety of organic dusts, restrictive diseases and both organic dust exposures and naturally occurring silicates in the soil, and hypersensitivity pneumonitis and organic dusts. Nevertheless, large gaps still exist in our understanding of the epidemiology of respiratory diseases in agriculture, particularly regarding the prevalence and etiology of these diseases in the hired farm worker population.

In 1988, the first major study of respiratory status in hired farm workers was conducted on 759 workers in three California crops: grapes, citrus, and tomatoes. Data were collected on demographics, smoking status, and respiratory symptoms, and pulmonary function testing was performed. There were relatively low prevalences of chronic cough, phlegm, and wheezing (1.6, 5.1, and 2.8%, respectively), but after controlling for smoking status, the forced vital capacity (FVC) was consistently

lower and the forced expiratory volume in 1 second (FEV1)/FVC was consistently higher for grape workers compared to other crop workers. The change in FVC was most marked in men older than 25 years (250–300 ml decrease). The researchers concluded that these findings could represent a work-related restrictive lung disease due to either silicates in the soil, organic agents, or pesticide exposure (such as paraquat) and suggested follow up evaluations to document exposure and perform radiographic studies of the workers.[34,35]

A second study looked at 354 Hispanic migrant farm workers working with a variety of crops in Indiana. This study found a higher prevalence of chronic cough, phlegm, and wheezing than was found in the California study (8.5%, 6.2%, and 6.5%, respectively) despite a similar frequency of current/former smokers. Results of pulmonary function testing showed that 15% had a FEV1/FVC of < 75%, and 6% had a ratio < 70%. Multivariate analysis found that these obstructive changes were associated both with smoking and the number of years doing farmwork. The author concluded that although smoking was an important factor, work-related exposures such as dusts, pesticides, and fertilizers may play a role.[36]

Dermatitis

Dermatitis in agricultural workers has been associated with exposures to a variety of agents, including pesticides and other chemical substances, sensitivity to plant materials, and infectious agents (Table 3). Several excellent reviews have examined the associations between specific chemical and biologic exposures in agriculture and dermatitis.[42,68]

Agricultural workers have the highest incidence of skin disorders of all industrial classifications.[9] The annual incidence in 1996 for all of agricultural production was 27.6 per 10,000 workers and for crop production was 28.1 per 10,000 workers, as compared to an annual incidence for all private industry of 6.9 and for manufacturing of 14.1 per 10,000 workers.[9] Surveillance information from California provides insight into the causes of these cases.[69] A review of cases from California reported to BLS in 1979 showed that of 1550 cases, 48% were due to poison oak, 15% were due to other plant products, 20% were due to chemical agents, primarily pesticides, and the remainder were due to edible food products such as fruits, nuts, and vegetables.[54]

A study by the Migrant Clinicians Network of 6969 patient encounters in four clinics located along the Midwest migrant stream found that dermatitis was the primary

TABLE 3. Agricultural Exposures Associated with Dermatitis

- Fungicides
  - Ziram and thiocarbamates
  - Elemental sulfur
  - Benomyl
  - Captan
  - Chlorothalonil
  - Ethoxyquin
- Insecticides and Miticides
  - Organophosphates
  - Carbamates
  - Miticides
  - Pyrethrin and pyrethroids
- Herbicides
  - Paraquat and diquat
- Fumigants
  - Metam sodium
  - Methyl bromide
- Glyphosate
- Plant-Related Substances
  - Poison oak and poison ivy
  - Compositae plants
- Zoonoses
  - Tinea
  - Viruses
  - Mites

From O'Malley MA: Skin reactions to pesticides. Occup Med 12(2):327–345, 1997; with permission.

cause of clinic visits for males age 20–29 and was second only to hypertension-related visits for males 30–44. When comparing their data to the National Ambulatory Medical Care Survey of all ambulatory care visits in the U.S., dermatitis visits were 150% higher in the migrant group compared to the general population.[29]

Besides case reports, few studies have looked at the prevalence and etiology of dermatitis in hired farm workers. Based on the results of a pilot study that suggested that grape workers had a higher rate of dermatitis than hired farm workers in other crops, a study was carried out to determine the prevalence of dermatitis in California grape, citrus, and tomato workers and to examine associated risk factors. The investigators collected questionnaire data and performed a visual dermatologic examination of 759 hired farm laborers, of whom 238 were grape workers. Ninety (11.9%) workers reported a rash lasting 2 days or more during the previous 12 months; of these workers, only 21% reported seeing a health care professional. Grape workers were more likely to report rash than tomato or citrus workers (21% versus 6.2% and 10.8%, respectively). The most common diagnoses on physical examination were pustular eruptions (27% of all workers), facial acne (17%), lichenified hands (14%), and keratosis pilaris (13%). Contact dermatitis was more common in grape workers versus tomato or citrus (5.5% versus 0.8% and 0, respectively). Among grape workers there was significantly more contact dermatitis in those that worked with multiple pesticides versus those working with "sulfur only." Lichenified hand dermatitis also was associated with grape work, as well as hours working per week and lack of glove use.[33]

Infectious Diseases

The seasonal nature of hired farm work, combined with farm workers' modest economic resources, has promoted a crisis in the standard of housing for workers. Sufficient housing is available for only about a third of all farm workers.[87] One study of a California farm worker community found that 28% of residents lived in "back houses," which consisted of tool sheds, garages, informal shacks, or abandoned automobiles located behind official residences.[80] This housing crisis has resulted in crowded, inadequate living conditions, an important consideration in the promotion and spread of communicable diseases. Additionally, although the Occupational Safety and Health Act requires the provision of sanitation facilities in the field, farms employing 10 or fewer workers are exempt. According to NAWS, between 1992 and 1996 about 15% of farm workers reported not having access to water for washing and 16% were without access to toilets in the fields.[62]

Several studies have documented the presence of enteric diseases in farm workers.[18,94] One study in Utah found that workers on farms without sanitation facilities had a clinic utilization rate for diarrhea 20 times higher than that of the urban poor.[4] An evaluation of the quality of drinking water in 27 migrant camps in North Carolina showed that, although all camps were tested and approved by state sanitation officials prior to occupancy, 44% were positive for coliform contamination with counts ranging from 1–186 colony forming units. A related study by the same group documented an incidence rate of new parasitic infections of 9.5%; these infections were associated with the use of latrines rather than flush toilets and the presence of coliforms in drinking water.[18]

The other major infectious disease that has been well documented among hired farm workers is tuberculosis (TB). The Centers for Disease Control (CDC) reviewed TB cases from 29 states and found that farm workers accounted for 5% of all employed patients, suggesting a six-fold greater risk of TB in farm workers than in the

general population of employed adults.[14] Several cross-sectional studies have documented the prevalence of TB infection using purified-protein derivative skin tests. In California the prevalence of reactivity was 16%,[46] in North Carolina 23%,[19] in Indiana 28%,[36] in Delmarva Peninsula 37%,[44] and in Florida 44%.[92] Some of the differences between California and East Coast camps were attributed to the higher frequency of homeless, single, and highly mobile populations in some of the East Coast samples.[46] Based upon these findings, the CDC in 1992 issued a series of recommendations for the prevention and control of TB in migrant farm workers that called for substantial coordination and investment of resources on the national, state, and local levels.[15]

Exposure to human immunodeficiency virus (HIV) is a concern of increasing importance in the hired farm worker population.[26] In 1992, a screening program of 310 Florida farm workers showed a 5% prevalence of positive HIV-1 serologic tests.[92] As the farm worker population becomes increasingly male, unaccompanied, and foreign-born, its potential for exposure may increase. Recent ethnographic studies have documented that young Mexican farm workers express concern over the presence of prostitution and illicit drug use in their communities.[39]

Cancer

Numerous epidemiologic studies have focused on the evaluation of cancer in farmers.[7] Despite farmers' overall lower mortality rates for all causes combined and from all cancers combined, studies have documented increased mortality rates for cancers of the lip, stomach, skin (melanotic and nonmelanotic), prostate, brain, testis, and connective tissue, as well as Hodgkin's and non-Hodgkin's lymphoma, leukemia, and multiple myeloma. Particular attention has been focused on the role of pesticides since a variety of different types and chemical classes of pesticides have been classified by the International Agency for Research on Cancer as having limited or sufficient evidence of carcinogenicity in animals.[100]

Nonetheless, very few of these studies have focused on hired farm workers, who differ substantially from family farmers with regard to racial, socioeconomic and lifestyle issues as well as both occupational and nonoccupational exposures.[49] Zahm and Blair of the National Cancer Institute (NCI) recently reviewed the studies on hired farm workers' cancer risk and found that hired farm workers, like farmers, had excesses of multiple myeloma and cancers of the stomach, prostate, and testis as well as excesses of cancers of the lung, buccal cavity, and pharynx. Two of the three studies finding the excesses in the latter cancers were conducted in Utah and may have been biased by a predominantly Mormon referent population, which characteristically would feature low use of alcohol and cigarettes.[99]

The NCI group outlined a number of methodologic challenges involved in farm worker cancer mortality studies, including the accuracy of the occupational code on death certificates, the difficulty of followup due to the population's mobility, and the complexity of estimating exposure since most work for multiple employers in multiple different crops. In a followup report, however, the NCI reported good success in working with a variety of universities, migrant advocacy groups, and other federal agencies to develop successful feasibility studies addressing many of these limitations.[98]

Eye Problems

Eye problems are common in hired farm workers and result from irritation and trauma caused by exposure to chemical substances, dusts, plant materials, and other foreign substances.[95] According to the BLS, in 1996 eye injuries represented 4.8% of all lost-workday injuries in the agricultural sector and occurred at a rate of

14.2/10,000.[9] The Traumatic Injury Surveillance of Farmers Survey injury data described above found that 9.2% of injuries in Hispanic farm workers were to the eyes.[67] Little evidence exists, however, documenting either the causes of these eye injuries or the associated work-related risk factors, such as the prevalence and use of eye protection.

Data from California for 1976 showed that of 943 cases of reported occupational eye injuries, 25% were caused by flying particles, 15% by chemicals, and 10% by thorns, stalks, vines, and bushes.[80] In a screening program of about 1500 hired farm workers and their families in California, blepharitis and pterygium were common causes for failing the examination, especially in those over age 45. These conditions may have resulted from chronic irritation due to dust and wind while working in the fields.[95]

Pesticide exposure is one of the better documented causes of eye injuries, with about 25% of California reports of pesticide effects involving the eye. A review of California data from 1987 showed that systemic and skin reactions result both from fieldwork contact with pesticide residues as well as from pesticide mixing, loading, and application tasks, while eye injuries more commonly occurred during the latter activities.[1]

Mental Health

Many hardships face the hired farm worker community, making it ripe for high levels of stress, anxiety, and depression. A GAO report to Congress in 1992 summed up their status well:[87]

> *Poor living and working conditions make life difficult . . . Exposure to pesticides threatens their health . . . Many hired farmworkers work in fields without drinking water, handwashing facilities, or toilets. Some families are homeless, others live in substandard housing. Many farmworkers do not get the medical services they need. . . . Their children—who may work in the fields because the families need the money or lack access to childcare facilities—are subject to educational disadvantages and health risks from injuries and pesticides.*

Social isolation and disruption of the nuclear family also are increasingly common characteristics of this population. Between 1990 and 1995, the proportion of hired farm workers who were away from their family increased from 39% to 56%. Among married men, 50% were away from their spouses, while only 9% of married women were working alone. Therefore, many wives of hired farm workers spend months alone with their children while their husbands live in communities of other unaccompanied males.[86]

Clinicians in Oregon migrant clinics estimate that 50–75% of clinic visits by women were for physical complaints with underlying psychosocial problems, usually depression. A review of the records of 73 visits showed that 37% received a diagnosis related to mental health or family disruption.[92] The males living alone are at risk for alcoholism and its associated health and social problems. One study in New York State migrant camps documented heavier drinking patterns in the communities of unaccompanied males as compared to camps composed primarily of family groups.[95]

One of the quantifiable manifestations of this stress, child mistreatment, has been systematically studied in New York State, using a combination of the state's Central Registry for Child Abuse and the Education Department's census of migrant children. Verified reports of child maltreatment were found for 298 (4%) of 7408 migrant children. This was a six-fold greater risk compared to other children living in New York State.[3,50]

CONCLUSIONS AND RECOMMENDATIONS

Hired farm labor has become more important in U.S. agriculture in recent years owing to substantially increased production of labor-intensive commodities. It is likely that these trends will continue. All of the available evidence indicates that the demand for seasonal hand labor also will continue to increase.

Within California and other important states, agriculture is becoming more intensive. Despite urbanization, California's Central Valley has experienced a net growth of some 200,000 acres of trees and vines in just the past 10 years. The same region saw harvested vegetable acreage expand by 41% during the same time frame. All of this growth in the production of labor-intensive crops has come at the expense of extensive crops, such as cotton, oats, barley, and pasture. In effect, labor-intensive crops are replacing extensive crops on an ever-shrinking base of cropland.

Recent changes in the composition of the hired farm labor force indicate that the Mexicanization of the labor force will continue unabated, and will include increased numbers of persons who are not authorized to work in the U.S. To illustrate, the 1995 NAWS survey demonstrated that 18% of the hired crop labor force were first-time hired farm workers. While about 37% of all hired farm workers were undocumented, among the newcomers the figure was about 70%.

Since most foreign-born hired farm workers have low educational attainment and are functionally illiterate, it is likely that their nonagricultural employment opportunities will be quite limited. For this reason, the hired farm labor market is most accurately described as *segmented*, meaning that there is relatively little outward mobility to high-paying, permanent U.S. jobs in other sectors. At the same time, there is evidence of mobility out of agriculture into other types of unskilled work. Thus, a general tightening of the U.S. labor market, as reflected in low rates of unemployment, will be less likely to affect hired farm labor markets.

One industrial segment where hired farm workers do seek nonfarm jobs is in the food processing industries. Post-harvest agricultural employment, such as packing, sorting, or processing fruit and vegetables, has experienced important changes that are related to the intensification of agricultural production. Jobs involving packing and shipping fresh produce have increased in number. In contrast, employment in canneries, freezers, and similar processing industries has sharply declined, because consumers increasingly prefer fresh produce and have curtailed their purchases of canned and frozen fruits and vegetables. Moreover, counter-seasonal produce imports, such as fresh table grapes grown in Chile, have displaced off-season sales of canned and frozen fruits.

Workplace exposures in food processing differ from those found in farm fields. Repetitive motion injuries, rather than back injuries that arise from stoop labor, are more likely.

Recommended Initiatives

Two types of initiatives have been advanced to address the high incidence of occupational injuries and illnesses occurring among hired farm workers. First, interventions designed to improve the health status of this population have been suggested. Second, a research agenda has been proposed for surveillance.

With regard to interventions, a report completed in late 1997 surveyed the health status of California's hired farm work force.[91] There were ten major recommendations; those pertinent to occupational health are as follows.

Recommendation 1. Form blue-ribbon commissions comprised of health educators, epidemiologists, and engineers to develop evaluation and assessment methods

for testing the efficacy of occupational safety intervention programs, both public and private.

Recommendation 2. Systematically study the causes and prevention of the priority occupational health problems of hired farm workers by promoting and funding the collaborative efforts of public health specialists, epidemiologists, agricultural engineers, and bilingual worker representatives.

Recommendation 3. Establish a private watchdog group to monitor enforcement activities of public agencies with responsibility for labor and safety in the fields. Oversight is needed for the activities of the U.S. Department of Labor (Wage and Hour Division), U.S. EPA, OSHA, and state and local agencies.

Recommendation 4. Develop a separately funded program of collaboration with appropriate agencies to strengthen safety and labor law enforcement. Use informants to provide leads to enforcement agencies. Obtain key data about labor law violators, such as business name, address, telephone number, site location, use of fictitious business names, dates of transactions, and contacts with workers.

Recommendation 5. Promote settlement of migrant workers, especially unaccompanied males, through the development of suitable housing. The major decrease of employer-provided housing in recent years has left many workers homeless, resulting in a dramatic increase in the number of people living in unhealthful or substandard units. In addition, present day housing programs for hired farm workers are based on the nuclear family model, neglecting the fact that most workers live in either extended family households or solo male households.

Recommendation 6. Develop binational health education and outreach programs through collaboration with the Mexican government, universities, and other private organizations.

Strengthening Regulatory Enforcement

Perhaps the most difficult task of all is strengthening enforcement of existing laws. This effort has two aspects: bolstering the capacity of enforcement agencies, and enhancing worker awareness of their rights under U.S. and state laws. Of course, adequate resources are vital to the capability of an agency to carry out its mission. But independent of this important resource issue, enforcement agencies have not been able to keep up with the rapid changes in the composition of the hired farm work force. Even today, some front-line enforcement agencies in the occupational safety field send out non-Spanish-speaking staff who find themselves unable to communicate with most field workers.

Many workers are unaware of existing federal and state laws that are intended to provide minimal levels of safety education and protection. Therefore, education programs are a must. But those that are based on traditional U.S. teaching methods are not likely to be especially successful among workers who are mostly illiterate and have only limited formal education. A word whose meaning is widely understood among well-educated U.S. residents, such as "pesticides," may not be meaningful to a surprising number of hired farm workers. The terminology used by workers—*quimicos* or *medicinas para las plantas*—may be unfamiliar to a trainer.

Finally, many hired farm workers are skeptical about the value of enforcement agencies since, in their view, they are mostly ineffective, and a worker could lose his or her job if the boss becomes aware that a complaint has been filed. Worker informants could play a vital role in providing timely and otherwise confidential information that is usually unavailable to enforcement agents. In a sense, both enforcement staff and hired workers need each other's help, but have been mostly unable to build

a relationship of confidence and trust. The burden is on enforcement agencies to demonstrate that they are worthy of the hired farm worker's trust.

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