FEATURE ARTICLE
Continuing Education

The Risky Business of Production Agriculture

Health and Safety for Farm Workers

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When occupational health nurses think of food and fiber, their thoughts might instantly turn to the commercial establishments that process vegetables or spin cotton into fabric. However, before the raw products arrive to be processed, they must be produced. America is home to more than 2 million farms and ranches, and boasts the most efficient agricultural production in the world. While a few of these businesses are large commercial operations, 95% of farms remain family owned and operated. Each farm, whether a large or small agricultural enterprise, requires major financial investment in land, machinery, equipment, and labor. Tractors and combines frequently cost more than $100,000, and land prices rise annually. American agriculture is no small business, with the average worth of land, buildings, and equipment per farm in excess of $500,000 and an average market value of products slightly more than $102,000 per farm (U.S. Department of Agriculture [USDA], 2002). Nearly 2 million workers in the United States list farm work as their primary occupation (U.S. Census Bureau, 1990). This number does not include the uncounted temporary workers, individuals with another primary occupation, or unpaid family members.

EPIDEMIOLOGY OF AGRICULTURAL INJURY AND ILLNESS

Agriculture annually ranks among the top four most dangerous industries in the United States, switching fatality rankings from year to year with transportation, construction, mining, and manufacturing (National Safety Council, 2002). A 1995 national survey of farms yielded an estimated 195,825 lost time work injuries and approximately 3.39 million restricted workdays (Myers, 2001a). Unlike other businesses, agriculture is exempt from many safety regulations because of the few numbers of fulltime paid workers on most farms. Only farms that employ more than 10 fulltime, nonfamily workers must comply with recording worker illnesses and injuries according to Occupational Safety and Health Administration (OSHA) standards (Baker, 1993). Most farmers can set their own work schedules and their own safety regulations. Machinery often lacks safety devices. Tractors lack protective roll bars and seat belts, belt and pinch point guards may be damaged or missing, and rotating shafts and augers may be left uncovered. Laborers may work with chemicals without proper training or protective equipment, with large animals that bite, kick, and crush, or in noisy environments.

Moreover, injuries that occur on farms are not minor. According to Myers (2001a), sprains and strains (28.2%), fractures (17.4%), and lacerations (15.2%) comprise the leading injuries. The body parts most likely to be injured are the lower extremities (17.4%), followed by the back (14.4%) and fingers (13.2%). Workers age 30 to 39 incur 21.7% of all injuries. While less documentation exists about illnesses, it is not uncommon for farmers to suffer from occupationally induced acute and chronic health conditions. A report on gender differences of longest held occupations noted that among individuals age 17 to 24 who worked in agriculture, 23.8% of women and 16.5% of men reported activity limitations caused by chronic conditions (Cooper, 1993); these proportions increased to 50.9% and 60.5%, respectively, after age 65. Silo filler's disease, organophosphate poisoning, and skin cancer are but a few examples of the diseases.

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Approximately 2 million farm workers are age 20 and younger. Approximately 1.4 million of the workers in this age group reside in farm households, and the remaining 600,000 work on farms as hired labor (Myers, 2001b). The full extent of children's illnesses and injuries caused by farm exposure is underestimated because the Bureau of Labor does not include children younger than age 16 in their databases. Research studies reveal that each year 104 children die on farms and more than 23,000 suffer farm work injuries (Myers, 2001b; Rivara, 1997). One study in New York (Belville, 1993) reported permanent disability in youth with farm related injuries surpassed similar outcomes in other occupations. Many of the injuries to young children are results of merely being present in the farm work area. Machinery related injuries and drowning are among the mechanisms of injury for young children (Myers, 2001b). As they grow older, children take on more work responsibilities of the farm. Adult supervision decreases, leaving the child to manage risk independently. Injury patterns tend to shift to include large animals and powered equipment in addition to tractor and machinery induced injuries. Adolescent injury rates exceed that of adult farm workers when adjusted for number of hours worked, with teenage boys exhibiting the highest rates (Castillo, 1994). In addition to acute injury, there is documentation that cumulative trauma injuries from farm work, such as hearing loss and musculoskeletal disorders, begin to manifest symptoms in the early teen years (Broste, 1989; Millard, 1996).

WHO FARMS?

Historically, U.S. farms were operated by individuals whose sole vocations were to work the cropland and produce livestock. While many of these enterprises still exist, in the past four decades, the declining economy of the family farm has resulted in a shift to bivocational farming. Currently, more than one half of the nation's farmers and ranchers have off farm employment in addition to their agricultural work (USDA, 2002). Agriculture provides a second income but still demands many hours of labor. Whether farming is the individual's sole occupation or the combination of two concurrent jobs, the demands of production agriculture and the physically intense nature of farming make it imperative that occupational health nurses understand as much as possible about their clients' farm work. Understanding workers in the context of all work performed by them places the occupational health nurse in a better position to promote and maintain a healthy work force.

In 1997, the average age of the principal operators of U.S. farms was 55 years old, and this average age is expected to increase in the future (USDA, 2002). This is in comparison to the average age of 39.3 for the general U.S. civilian working population (Toossi, 2002). The increasing age is caused by several factors. First, the flight of young individuals from farms to more lucrative opportunities in urban areas began several decades ago. Now the tide is beginning to turn as young farm residents and young individuals wishing to enter production agriculture learn new ways to produce income on the farm. The return of middle aged adults to the farm also is an increasing phenomena. This "return to farming" frequently occurs as employees begin to look toward retirement from their off farm employment or as nonfarm individuals purchase smaller acreages in the country and enter production agriculture for the first time. The U.S. Department of Agriculture (2002) defines a farm as any establishment that has sales or potential sales of $1,000 or more in agricultural produce in a year. Many of the "newer" farms fall into this category and are operated by "hobby farmers," individuals who hold other primary employment but extract income from agriculture.

Women comprise the fastest growing segment of the agricultural population. Historically, women were viewed as reserve labor (Sachs, 1996; Rosenfeld, 1986), and farms were passed down to sons. Currently, women are full agricultural partners or principal farm operators (Walter, 1996). Instead of transferring farms to the son when the father dies, more spouses are assuming responsibility for farm operations.

Generally, it is the women of farm families who first seek off farm jobs. The primary reasons for off farm work by women in farm households is to provide health insurance for the family and for socialization (Reed, 1999). However, men many times can find better financial employment than women, so the men will work off the farm and the women are left to run the farm enterprise while the men are away. Women are entering agriculture as principal operators in record numbers as more men leave for primary employment off the farm. Females currently comprise 23% of all farm operators and 19% of all farm workers (U.S. Census Bureau, 1998). Women in agriculture frequently juggle on and off farm employment duties plus household responsibilities.

Women still function in reserve labor roles on many farms. As reserve laborers, they may not be familiar with the equipment, machinery, and work processes they are expected to perform. This intermittent work situation may place them at higher risk for injury and illnesses because they are unaccustomed to the intense physical strain and they may not be aware of the exposure hazards inherent in the task (McCoy, 2002).

Farming could not exist without seasonal labor. Seasonal workers provide farm labor during peak production either to make extra money or, more often, to assist their families who still farm. Like reserve labor by women, seasonal workers may suffer the consequences of inexperience and lack of physical conditioning. Many seasonal workers are young individuals fresh from farm life, while others are older workers who are pressed into the reserve labor force of family farming because of scarcity or price of farm labor. Coworkers of farmers who hold public sector jobs frequently help out on the farm during peak times.

The new labor of farming, migrant workers, generally work in agricultural jobs until they find something better. Migrant workers may come alone or with their families. This new labor force presents both opportunities and challenges to occupational health. Most migrant workers speak little or no English and must rely on translators. They are unfamiliar with work processes and with the

American culture. Usual forms of safety measures, such as warning labels written in English, mean nothing to these workers. Even their physical stature may be a hazard for them. Machinery and equipment are designed for the taller height of adult American men, not the shorter height of many migrant workers. Coupled with lack of training, ergonomic problems soon arise (U.S. Department of Health and Human Services, 2001).

WHY DO THEY FARM?

Research suggests farming, and in particular family farming, holds multiple meanings for those involved in this activity. The farm may represent the commitment of several generations to a particular place (the land) or a heritage to be transmitted across generations (Salamon, 1992; Sontag, 1996). Farmers speak of farming as being "in the blood" and report that leaving farm life is unthinkable to them, even after they forfeit a limb to their occupation (Reed, 1998). Farms are family businesses and are handed down through the generations. The family culture of farming, while spoken of with pride, has its downside. The farm economy is shrinking, and family composition has changed since great granddad was on the farm. The labor force, once composed of younger family members and neighbors who swapped farm work and equipment, is gone. The financial investments to continue farming are much greater than in previous generations. The pressure to maintain the land and the farm tradition frequently forces farm family members to engage in off farm work to pay the farm bills.

Along with the national scene, health care and other costs for farm families has skyrocketed. The growing movement to bivocational farming is, in part, because of the need to acquire affordable health insurance. If a family member can secure health insurance for the family through an off farm job, a substantial savings is realized. Given that agriculture has its own inherent risks for injury and illness, the employer health care plan assumes a high risk enrollee. This may, in turn, increase health insurance premiums for the off farm employer.

Migrant workers arrive in America with hopes of a better future. Agricultural work is their entry level into the work force, and they work in groups. Living conditions vary for these new workers. They may be in migrant labor camps, in housing supplied by the employer, or in privately rented dwellings. Some workers come to the United States only during peak production, while others stay year round. Many plan to bring their families as soon as they are financially able. These workers rarely have experience in agriculture and leave farm work as soon as they can find other employment. This means the migrant agricultural work force experiences constant turnover with new inexperienced workers on a regular basis.

RISK FACTORS IN AGRICULTURE

The mechanisms for injury and illness in agriculture are as varied as the farms themselves. In addition to mechanical and elemental risk factors, human factors and their interface in the farm environment also play major roles in outcomes of farm exposure. This section introduces some farm risk hazards (see Table 1) and farmers' responses to the hazards.

Table 1

Risk Hazards for Injury and Illness for Farm Workers

Crops

- Machinery and equipment
- Dusts and molds
- Chemical exposures (e.g., herbicides, insecticides)
- Special exposures (e.g., green tobacco sickness)
- Gases, fumes, and vapors

Livestock

- Crushing, kicking, and biting
- Animal health care work
- Zoonooses
- Chemical exposures (e.g., insecticides, organophosphates)
- Gases (e.g., methane)

Environment

- Noise
- Ergonomics
- Temperature extremes
- Ground conditions (e.g., mud, dust, ice)
- Physical structures
- Stress

The diversity in agriculture means there is no standard exposure. Each type of production and even each farm has its own unique environment. In general, one can expect at least some exposure to the following mechanical and elemental risk hazards:

- Machinery and equipment.
- Chemicals.
- Livestock.
- Cumulative trauma (e.g., noise and ergonomics).
- Elemental exposure.
- Farm stress.

Machinery and Equipment

The majority of production agriculture is highly mechanized. Machinery and equipment that chops, separates, grinds, and binds is necessary for the large scale production that allows each American farmer to feed 132 people. This expensive equipment generally is repaired by the farmers themselves and frequently has missing or damaged safety shields. In addition, safety devices often are disabled, removed, or unused, or they may never have been present on the machinery. Because machinery and equipment are kept for many years, they may not have been initially equipped with safety devices.

Compounding this is an abundance of shortcuts designed to streamline operations in a job where time is of the essence. Tractors can be rigged to be bypass started. This is a procedure in which the tractor is started in gear while the operator stands on the ground and sparks the ignition. After the tractor starts, the farmer then jumps onto the moving vehicle. Mowing machines must be greased every few hours and it saves precious time to leave guard covers off so grease points can be serviced quickly. Equipment is left running while repairs and adjustments are made. Rotating power take off shafts often are crossed to save steps.

With large riding machinery, the lack of side view and rearview mirrors makes it impossible for the operator to see obstacles to the side or behind the tractor. One of the leading causes of death among children on farms is being run over by tractors because operators are unable to see the child (Rivara, 1997). Gasoline powered equipment needs to be checked for faulty exhaust. Although tractors are operated outdoors, cases of carbon monoxide poisoning have been documented (Struttmann, 1997).

Another hazard presented by machinery is entanglement, which occurs rapidly in shafts that turn hundreds of time per minute. Gloves, loose clothing, and dangling strings on clothing and shoes are major risk factors for entanglement. Long hair poses a concern and should be pulled back and fastened. In a series of events involving hay balers, four women experienced scalping because of hair entanglement ("Scalping Incidents," 1992). The author's sister recently suffered a below the knee amputation because her shoelace became entangled in a mower blade. Such instances are all too common in farming. Thus, it is important to remember: "If it dangles, it tangles."

Chemical Exposure

Farmers use all kinds of chemicals that have potentially adverse health effects. Solvents are used to clean equipment and motors, and organophosphates are used in sheep dip and other applications. Organophosphates, carbamates, and bipyridyls are commonly used on farms. Although farmers are required to attend an educational course on chemical application and safety to purchase certain chemicals, there is little supervision of use after the chemical is purchased. Farmers may improperly mix and apply the chemicals or reenter fields before the required drying time. Because of the high cost of chemicals, many farmers elect to store the unused chemicals on their premises, frequently in unsecured buildings and in unmarked containers.

Workers of all ages suffer the consequences of chemically related illness. A recent study published in the *American Journal of Public Health* (Calvert, 2003) noted that youth working in agricultural jobs had a higher incidence of pesticide related illnesses than in all other work combined. A 5 year study in Wisconsin reported mixing and applying herbicides or applying fungicides in the 2 year period before trying to conceive increased the risk of female infertility (Greenlee, 2003). Linkages between agricultural chemicals and health conditions such as Parkinson's disease and severe depression have been suggested (Stallones, 2002).

Moreover, the use of personal protective equipment among farmers when mixing and applying restricted use chemicals remains abysmally low. Perry (2002) reported knowledge of proper personal protective equipment was adequate but intentions and beliefs, as well as being "too busy," greatly influenced compliance. Even in the broader scope of agricultural work, personal protective equipment is not routinely used on many farms. Carpenter (2002) assessed use of personal protective equipment among 1,493 Midwestern farmers and found that, with the exception of welding masks, farmers rarely used such equipment on a routine basis. Farmers are aware of personal protective equipment and are satisfied with availability and cost of the equipment but expressed personal preference not to use it. Until recently, little attention has been focused on the importance of personal protective equipment in general agricultural work and the consequences of failure to use appropriate protection on a regular basis. Farms operate as independent establishments where worker training is generally done through observation and social modeling (Garkovich, 1995). New workers may not understand personal protective equipment is needed unless they are provided with specific instructions that identify the hazards of working without the appropriate equipment.

Unique hazards in crop production also increase the health risk of farming. One such hazard is green tobacco sickness, associated with tobacco harvest and especially prevalent during wet weather. The tobacco plant exudes nicotine that workers absorb through their skin during the hand harvesting process. During wet weather, workers' clothing and skin become saturated with the nicotine laden water on the plant. The symptoms of green tobacco sickness closely resemble organophosphate poisoning so the illness may be misdiagnosed if the health care provider is not familiar with this condition. Other commodities carry their own risks for unusual illnesses.

Livestock

The risk for injury related to livestock production is greater than the risk for injury associated with crop farming (Myers, 2001a). Animals are unpredictable, often weigh several hundred pounds, and carry the risk of transferable diseases. Interaction with animals places workers at risk for crushing, kicking, and puncture wounds from animal bites. Farmers perform much of the animal health care themselves. The operations of dehorning, deworming, and castration place workers in awkward positions and in close proximity to the bulk of the animal. Even the medications can be deadly. A recent report on the death of a 38 year old cattleman noted the man died after being kicked by a cow and falling, resulting in the man accidentally injecting himself with Micotil, a livestock antibiotic with no antidote. The cattleman, who had intended to use the medication on the cow, had prefilled the syringe and placed it in his pocket (Von Kampen, 2003).

All animals, whether domestic or wild, carry the risk of disease transmission. Zoonoses are not uncommon among agricultural workers. Wild animals, especially

skunks and raccoons, can transmit rabies to farm animals, which then infect farm residents. Contact with diseased animals can lead to dermatological, respiratory, and bacterial diseases. *Leptospira* species have been found in cattle, pigs, horses, dogs, rodents, and wild animals. Humans become infected through contact with water, food, or soil containing urine from these infected animals. Another organism that can infect sheep, goats, cattle, deer, elk, pigs, and dogs is *Brucella*. Humans can become infected by coming in contact with animals or animal products contaminated with these bacteria. Worker hygiene and protective strategies affect transmission of these conditions.

Cumulative Trauma: Noise and Ergonomics

Not all injury in agriculture occurs instantly. A case control study conducted in Iowa compared injured farmers to noninjured farmers (Sprince, 2003). Injured farmers were more likely to have a history of arthritis and hearing loss. Cumulative trauma takes a toll on hearing and muscles (McCurdy, 2000). Noise levels in swine confinement buildings can reach 160 dB, equal to a jet engine, and clearly present an immediate threat to hearing. Tractors under load commonly reach 100 dB and higher. Nearly all farmers use chain saws, which emit noise levels in the 120 to 140 dB range and are used close to the head. The deleterious effects of excessive noise on farms have been documented even in teenagers who live on farms (Broste, 1989). By the time a farmer reaches middle age, moderate to severe hearing loss is evident in 3 of 10 farmers (Browning, 1999).

Repetitive motion is intense during selected farm production processes. Even though much of the work has been mechanized, there are times and processes that require long hours of repetitive motion. Hand strain is common among blueberries pickers (Millard, 1996). During harvesting, blueberries are "raked" into collection bins. The small metal rake is held for hours at a time, resulting in overuse of hand and forearm muscles. Vegetable and fruit production requires similar episodes of long duration repetitive motion. Bending and stretching results in back, neck, and arm strain. Twisting motions exacerbate cumulative trauma to the neck and back (see Figure 1). New developments in carrier and collection bins and techniques hold promise for reducing these injuries (U.S. Department of Health and Human Services, 2001).

Elemental Exposure

Farm work must be performed regardless of weather conditions and sometimes, because of them. Farmers spend long hours in hot, humid conditions harvesting crops. Heat exhaustion can occur in the fields or in confined areas such as barns and sheds. In the winter, cattle must be fed and watered. Herds must be checked daily. Icy or rain slick surfaces increase the chance of falls. Ultraviolet rays lead to increased susceptibility to skin disorders, including sunburns and melanomas, and damage to eyes that can lead to cataracts. The use of protective clothing, wide brimmed hats, and even sunscreen is uncommon among farmers. Women reported using farm

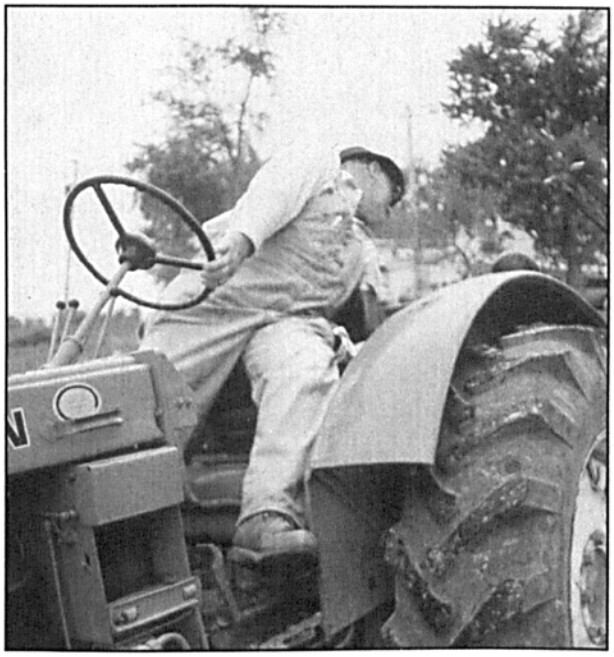

Figure 1. Twisting motions can produce ergonomic strain. Note the lack of a roll bar or seatbelt on the tractor.

work time to intentionally tan in a study conducted in Kentucky (Browning, 1999). Men frequently work bare chested, exposing large areas to damaging rays. The forecast of inclement weather also leads to hurrying to get the job done, a precursor to increased risk for injuries. Farming is weather driven. Crops are planted, tended, and harvested according to the weather.

Dust and mud are encountered on all farms. Farmers rarely use respiratory protection (see Figure 2), and even when it is used, the type of protective device may be unsuited for the exposure or a poor fit. Muddy or frozen ground carries its own risks for falls. Uneven terrain, with pock marks of ice or puddles of water, increases the risk of falling and subsequent injury. Canals, used for irrigating crops, can become swift channels of gushing streams that pose drowning risks.

Physical Structures

The physical structures of the work environment can add to the risk of injury and illness. Buildings may not be properly designed for the job at hand. As work and commodities change, existing buildings are used for the new work. This may mean that lighting, ventilation, and electrical circuits may be inadequate. Ladders and steps may be in poor repair. Floor surfaces may be uneven and slippery. Improper or insufficient airflow may expose the worker to high levels of dust, endotoxins, animal dander, and deadly gases. Animal handling facilities may not allow workers to be protected adequately from the animals. Agricultural workers may not know of these hazards because most buildings are not evaluated for job hazards.

Farm Stress

At times, production agriculture is a high stress industry. Farmers are at the mercy of the elements and

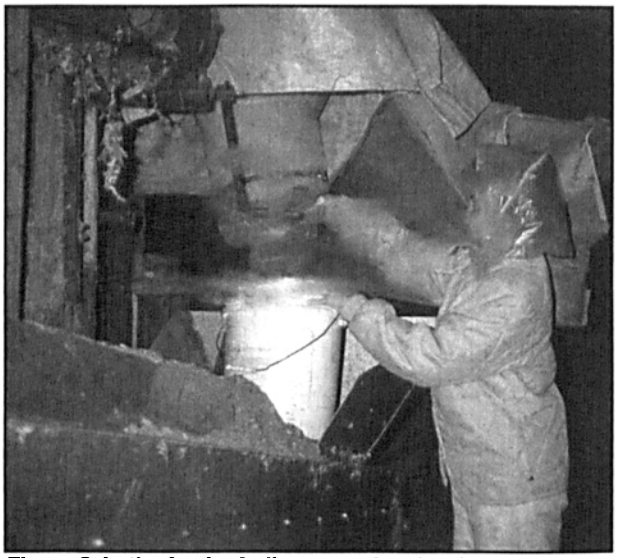

Figure 2. In the feed grinding area, dust levels can be high. Note the use of protective hair equipment but not protective eye or breathing equipment.

global markets. The majority of farmers carry high debt loads each year; a poor yield can lead to loss of the farm operation and the land. Peterson (1990) reported farmers make up only 2% to 3% of the population but commit suicide at two to three times the rate of nonfarmers. Depression has been linked to higher injury rates in a prospective study of adult farmers (Park, 2001).

Stress extends to the entire family and often it is the wife who feels it first. The wife is the traditional bookkeeper on the farm and is in a position to know the financial profile (Reed, 1999). She may elect to shield her husband from the bad economic news and carry this burden alone. Such stress can affect her off farm job performance. In addition, households must be maintained even during peak work times on farms. Day care is nearly nonexistent and expensive in rural areas, so farm families with children often take the children with them to the fields. This arrangement adds extra pressure to an already stressful situation and is less than ideal for both the parents and children.

Stress also has been linked to the occurrence of injuries on farms (Kidd, 1996). In times of stress, such as needing to get the crop in before the rain comes, the farmer may elect to leave guards off instead of replacing them after a repair performed in the field, even though the farmer knows this increases the risk for injury. Stress is accompanied by fatigue. Fatigue continues to the off farm job, thereby increasing the risk of injuries not only on the farm but also at the off farm job as well.

IMPLICATIONS FOR THE OCCUPATIONAL HEALTH NURSE

Whether occupational health nurses work directly with farm groups, in another industry, or in a clinical setting, contact with farmers and their families will occur. Occupational health nurses can be prepared to meet the needs of the farm community by becoming familiar with the role of agriculture in the community and the population's involvement in farming. The first step is to assess the environment. Simply driving around the area will yield valuable information. For more information about local farming, occupational health nurses should contact the Cooperative Extension Education and Research Service Office (CEERSO) available in every county of the nation. This U.S. Department of Agriculture Program provides direct services to farmers and the general public, not only on agricultural issues, but also on a variety of life skills. The extension agricultural specialist can provide essential information about local agriculture and peak production times, as well as other useful information.

It is essential to understand the work patterns and seasonality of work in agriculture. The person in charge of a dairy will be in the barn by 4:30 a.m. and return to milk again in the late afternoon every day, whereas a farm that produces only grain will require very intense periods of long work hours, then perhaps 2 months of a lighter work schedule. Each type of agricultural commodity has its unique risks. By becoming familiar with agricultural work and risks in the area, occupational health nurses will be able to understand the complexities of the work, provide health promotion programs, and relate to workers who perform agricultural tasks.

As part of the occupational history, all nurses, regardless of their setting, should ask about farm work performed by the client. Because more than half of the nation's farmers also have off farm jobs, many employees also farm. In an assessment of physicians from 27 states, 93% of the physicians reported they knew their clients included farm families, yet only 4% had received any continuing medical education in the past 3 years that included mention of agricultural health topics (Prince, 2001). Involvement in farm work increases the chances of contracting unusual diseases such as tetanus or Lyme disease. In a study of women who resided in farm households in Louisiana, only 53.7% of the women had a current tetanus immunization. Only half of the immunizations were routine, indicating that farm women may not include tetanus immunizations in their preventive health measures (Holland, 2001). Children perform farm work at young ages and are exposed to agricultural hazards because of their home residence or because they visit farms. Thus, it is important to ask all family members about exposure.

The farm work pattern may impact the attentiveness, attendance, and productivity at the off farm job. Knowledge about farm operations and farm work performed by employees enhances the ability of occupational health nurses to assess and deliver appropriate care (see Table 2).

Farmers are often reluctant to seek medical treatment because of the cost and time involved. Occupational health nurses may be the first contact with the health care system even if the illness or injury was not incurred at the employment site. If the employee also farms, the occupational health nurse should ask about recent farm work to assess whether farm exposure is implicated in the presenting problem. For example, when an employee presents with fever, flulike symptoms, and cough, the occupational health nurse should ask about the type of

farm work performed recently. These symptoms are not infrequent after opening silos and may be indicative of silo filler's disease.

One of the goals of occupational health nursing is to promote the well being of the employees and the company (Rasmor, 2001). Safety and health carry over from the factory to the farm (Brandt, 2001). If workers are required to wear earplugs, safety shoes, and safety glasses on the job, they may be more likely to use these devices on the farm if they are reminded to do so.

Farming is usually a family affair. When addressing farm issues, the family unit should be included in programs. Many free or low cost resources are available to occupational health nurses to promote the health and safety of farm families (see Sidebar). Agribusinesses and federal government programs distribute free teaching tools on nearly every farm work topic. Ten agricultural health and safety centers, sponsored by the U.S. Department of Health and Human Services and administered through the National Institute of Occupational Safety and Health, are located across the nation. These centers conduct research and develop training programs to promote the well being of farm families. A list serve for nurses interested in farm health is available through the University of Kentucky, College of Nursing and the Southeast Center for Agricultural Health and Injury Prevention (see Sidebar). Individuals cannot join the list serve directly from a website, but must be added by the list serve administrator. For more information about list serve, contact the author at dbreed01@pop.uky.edu.

Occupational health nurses should take the opportunity to use special emphasis weeks. For instance, March is agriculture month, and National Farm Safety Week is the third week of September. Both are good times to promote the health of farmers and their families. As part of a program emphasis, occupational health nurses might offer free safety packets with sunscreen, hearing protection, telephone listings for emergencies and poison control, and perhaps arrange for cardiopulmonary resuscitation and basic first aid classes. Before peak production times, occupational health nurses can remind farmers to check and repair equipment and machinery. Occupational health nurses also can encourage farmers to care for their own bodies by assuring current immunizations and routine hearing tests.

Children deserve special attention related to their presence and activities on farms. Nurses should inquire about farm residence and farm work performed by children. Guidelines for nurses and other adults to use to determine if a child is developmentally ready to perform specific tasks are available and can be a valuable asset in keeping children safe (Lee, 1999).

Opportunities to show appreciation to farm families abound. Encouraging coworkers to thank farmers they know for the provision of a safe, healthy, and affordable food supply is one way to highlight the importance of farming. Coworkers also might assist farm families by offering to provide child care during harvest time, "meals to go" for farm families, or "break packs" with juice and cookies for the fields. Not only do these small acts of kindness promote health, they also have a secondary effect of increasing the sense of community at the workplace.

Table 2

Community and Employee Assessments for Farm Workers

Community Assessment

- How many farms are in your area?
- What kinds of farms are they?
- What do they produce?
- What types of machinery do they use?
- What kinds of chemicals do they use?
- When are the peak times of farm work?
- What kinds of health problems do local farmers have?

Employee Assessment

- How many employees also work on farms?
- What time of year do they work on farms?
- What kind of farm work do they perform?
- How many hours per week when they perform farm work?
- What type of personal protective equipment does the employee use when performing farm work?
- Are immunizations (especially tetanus) current?
- What existing health conditions could be exacerbated by farming?

During times of peak agricultural production, workers may manifest increased fatigue and stress. This may lead to increased injuries on the farm and at the off farm job. Juggling the demands of both jobs is difficult, and employees may be reluctant to ask for vacation time or shorter hours, or to refuse overtime. Young workers may be even more reluctant to speak up for fear of losing their jobs (Institute of Medicine, 1998). The occupational health nurse may be the best person to intercede on behalf of these employees who need special consideration during peak agriculture production times. By assisting with scheduling accommodations, both workers and employees may benefit.

SUMMARY

The lifestyles of employees affect their work and their health. Occupational health nurses need to know as much as possible about employees to render the best care possible. Production agriculture is a risky business performed by many employees. By understanding the risks involved, occupational health nurses can optimize the health of workers in the off farm and on farm contexts of

Agricultural Health and Safety Resources

Websites

1997 Census of Agriculture
www.nass.usda.gov/census/census97/profiles/agrimenu.htm

American Farm Bureau
www.fb.com

Farm Safety 4 Just Kids
www.fs4jk.org

Farm Safety and Health Information Clearinghouse
www.bae.umn.edu

National Ag Safety Database
www.cdc.gov/nasd

National Children's Center for Rural and Agricultural Health and Safety
http://research.marshfieldclinic.org

National Institute for Occupational Safety and Health Agricultural Centers
www.cdc.gov/niosh/agctrhom.html

National Safety Council
www.nsc.org

their lives. Managers and supervisors need to realize that investment in farm health and safety can yield financial benefits in terms of decreasing lost workdays caused by injury and illness and increased morale through public recognition of the importance of agricultural production.

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IN SUMMARY

The Risky Business of Production Agriculture

Health and Safety for Farm Workers

Reed, D.B.

AAOHN Journal 2004; 52(9), 401-409.

1. Agriculture is a "cradle to grave" industry that includes every age group among its work force.
2. Agriculture ranks among the top four most hazardous industries in the nation.
3. In addition to a high injury rate, farmers experience respiratory illnesses, occupationally related cancers, cataracts, and other chronic illnesses that are often preventable.
4. Two million children work in agriculture. An estimated 23,000 will be injured performing farm work this year.

CE Answers

Physical Examination for the Occupational Health Nurse: Skills Update

September 2003

1. C	6. C
2. A	7. B
3. A	8. A
4. D	9. C
5. B	10. D

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