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Eye Injuries to Agricultural Workers -- Minnesota, 1992-1993

During 1993, U.S. farm workers incurred an estimated 13,500 eye injuries that resulted in lost work time (1); many of these injuries could have been prevented. To determine the incidence of eye injuries and use of eye protection among farm workers, the Minnesota Occupational Health Nurses in Agricultural Communities (OHNAC) * examined data from the Minnesota Farming Health Survey (MFHS) conducted during January-April 1992 and December 1992-April 1993. This report summarizes the results of this analysis.

Occupational health nurses administered questionnaires during on-farm visits. Square-mile sections of land in three agricultural regions of the state were sampled at a sampling rate of 3.5%. All farms on any portion of the sampled land were selected. Farms were considered eligible for the survey if farm operators reported that they actively farmed, that they sold greater than or equal to \$1000 of farm produce annually, and that their farm income accounted for at least half of their total household income. Overall, 1359 farm household members living on 372 (68.5%) of 543 eligible farms were included in the survey; respondents were farm operators and selected adult household members. Farm injuries were defined as self-reported events related to farm operation that resulted in restricted activities for at least four hours, loss of consciousness, or seeking of medical care.

Respondents reported 106 farm injuries during the two periods ** (annual rate: 78.0 injuries per 1000 farm household members {95% confidence interval (CI)=63.7-92.2}). Ten persons sustained 11 farm-related eye injuries (10% of all injuries and 8.1 eye injuries per 1000 farm household members {95% CI=3.3-12.9}).

Of the 11 farm-related eye injuries, four were caused by chemicals and seven by foreign bodies. Chemical-related eye injuries involved splashes of liquid agricultural chemicals (two cases) and fungicidal dust (one case); the fourth incident involved discovery of an eye injury in a child who had exited a chemical storage shed, although the details of the injury could not be ascertained. Foreign body-related injuries were sustained in association with activities including working with hand and power tools, welding, grinding, cutting metal, and augering grain. The injured person was reported to have been using eye protection in only one of these incidents. Medical care was sought for nine (82%) of the 11 injuries; seven required immediate medical attention. However, no residual problems or restrictions were reported by respondents; three of the 10 injuries to adults resulted in lost work time.

Farm operators also were asked about their use of protective equipment and/or procedures while performing specific work tasks involving potential dermal exposures to agricultural chemicals

Table 1. For mixing or loading agricultural chemicals or for sprayer maintenance, 50% reported never wearing eye protection (e.g., goggles or safety glasses), and 9% reported never using protective gloves.

Of the 207 respondents who worked with anhydrous ammonia (an extremely caustic alkali that is stored under pressure and applied as a liquid fertilizer), 73 (35%) reported that they never or sometimes wore goggles, and 92 (44%) reported that they never or sometimes checked the water supply in their field emergency water tank. *** Reported by: C Lexau, MPH, D Bishop, PhD, Div of Family Health, Minnesota Dept of Health. Div of Safety Research, and Div of Surveillance, Hazard Evaluations, and Field Studies, National Institute for Occupational Safety and Health, CDC.

Editorial Note

Editorial Note: The MFHS findings document the occurrence of eye injuries in a specific production-agriculture worker group -- farmers and household members living on family-operated farms -- and are consistent with other recent reports. For example, the Regional Rural Injury Study, a population-based survey in five midwestern states, documented an annual rate of 58.3 farm injury events per 1000 household members -- farm-related eye injuries accounted for 8.2% of all farm injuries (2). **** Based on the Traumatic Injury Surveillance of Farmers survey during 1993, the estimated 13,500 eye injuries among farm workers in the United States that resulted in lost time from work accounted for approximately 6.7% of all lost-time injuries estimated for farming operations (1). Although the survey participation rate was relatively low, MFHS data for selected characteristics of farm operators and farm operations were consistent with data from the 1992 Census of Agriculture.

Based on the incident descriptions obtained by MFHS, each of the 10 eye injuries to adults would most likely have been prevented if appropriate and well-fitting eye protection had been worn while those persons engaged in work with agricultural chemicals, power and hand tools, and grain- or seed-moving equipment. Personal protective equipment traditionally has not been considered a primary strategy for hazard control. The preferred strategies have included hazard substitution (i.e., replacing a hazardous chemical with a less hazardous one) and hazard isolation or use of engineering controls (3). Although these strategies are applicable in agricultural settings (e.g., use of closed pesticide-handling systems), use of eye protection provides a practical and cost-effective method of preventing eye injuries among farm workers. Goggles are recommended for chemical splash protection, and safety glasses with side shields can provide adequate protection (except in dusty environments) against flying particles or objects (4,5).

In Minnesota, OHNAC is working with individual agricultural chemical dealers to promote the use of eye protection among their clients. Concurrent with educational programs and media promotions by Minnesota OHNAC staff, the chemical dealers have agreed to sell eye protection devices at a discount during the spring and early summer. Minnesota OHNAC has successfully used a similar approach with operators of local grain elevators to increase the availability of respiratory protection (6).

Chemical-related eye injuries are a focus for prevention efforts in Minnesota because they accounted for many of the eye injuries reported in the MFHS and represented most (67%) of the reported chemical injuries. The recently implemented U.S. Environmental Protection Agency Worker Protection Standard (7) requires farm operators (including family farmers) to adopt

preventive measures when working with pesticides. This standard includes requirements that all workers comply with personal protective equipment recommendations detailed on pesticide labels, that decontamination sites -- including an emergency water supply -- be furnished for employees, and that eye protection be used when closed pesticide-handling systems are operated under pressure.

References

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7. US Environmental Protection Agency. The worker protection standard for agricultural pesticides: how to comply -- what employers need to know. Washington, DC: US Environmental Protection Agency, 1993.

* OHNAC is a national surveillance program conducted by CDC's National Institute for Occupational Safety and Health, which has placed public health nurses in rural communities and hospitals in 10 states (California, Georgia, Iowa, Kentucky, Maine, Minnesota, New York, North Carolina, North Dakota, and Ohio) to conduct surveillance for agriculture-related illnesses and injuries that occur among farmers and their family members. These surveillance data are used to assist in reducing the risk for occupational illness and injury in agricultural populations.

** The reporting period for the winter 1992 survey was January 1991-December 1991; the period for the winter 1993 survey was November 1991-October 1992.

*** Keeping an emergency water supply in the field is a standard safety precaution; immediate flushing of skin or eyes following contact with anhydrous ammonia is necessary to mitigate the severe burns that will otherwise result.

**** The questionnaire for farm injuries used on the MFHS was adapted from the Regional Rural Injury Study, but the population eligible for inclusion in the MFHS included more full-

time farmers.

Table_1

Note: To print large tables and graphs users may have to change their printer settings to landscape and use a small font size.

TABLE 1. Percentage of respondents who reported using protective equipment during mixing and loading of agricultural chemicals and during sprayer maintenance -- Minnesota Farming Health Survey Minnesota, 1992-1993 *

| Equipment | Always/ Most of the time | | Some of the time | | Never | |
|-------------------|-----------------------------|------|------------------|------|-------|------|
| | No. | % | No. | % | No. | % |
| Protective gloves | 238 | (77) | 46 | (15) | 27 | (9) |
| Eye Protection | 82 | (26) | 74 | (24) | 155 | (50) |
| Face shield | 11 | (4) | 22 | (7) | 278 | (89) |

* Respondents were farm operators (n=311) who reported performing these work tasks.

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