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Rapporteur's Report Agriculture, Forestry, and Fishing Sector

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1. Introduction

The Agriculture, Forestry and Fishing sector comprises establishments primarily engaged in growing crops, raising animals, harvesting timber, and harvesting fish and other animals on a farm, ranch, or from their natural habitats (Executive Office of the President, 2002). About 2.1 million workers were employed in agriculture, forestry, and fishing in the United States in 2004, making it one of the largest economic sectors in the nation. The workforce total consisted of about 1% in forestry, 5.9% in logging, 2.6% in fishing, hunting, and trapping, and 9% in support activities for agriculture and forestry. The balance, over 81% of the workforce, was engaged in crop or animal production (U.S. Department of Labor, 2007).

This sector is unusual in a number of respects; nearly half of its workforce, almost 1 million individuals, are self-employed, many as farmers and fishers. Over the last 50 years, crop and animal production, and forestry and fishing in the U.S. have all achieved dramatic increases in the mechanization of production and in production efficiency. With better technology, many firms have consolidated and increased the size of their operations and output per employee (U.S. Department of Labor, 2007).

Individuals who work in these industries may feel strong ties to their job, as they often live in nearby rural communities close to the involved land, forest, or sea. However, they may pay a high price in terms of work-related risks of injury and disease, quality of life, access to health care, and overall health status, including higher rates of musculoskeletal pain and disabling discomfort (Saarni et al., 2007; NIOSH, 2006). For example, an average of 700 individuals from the farming and ranching workforce lose their lives annually, and another 120,000 are temporarily or permanently disabled (National Safety Council, 2007). Among work-related injuries, tractors cause the most worker fatalities in agriculture, while other farm equipment and animals contribute to the most injuries overall. Hands are the part of the body most often

injured and disabled. Small farms, and family farms with fewer than 11 employees, are exempt from enforcement of most federal workplace health and safety policies. Agricultural workers' relative risks for mortality appear to be elevated for a number of occupational illnesses including infectious and nonmalignant respiratory diseases as well as leukemia, multiple myeloma and cancers of the stomach and prostate (Fleming et al., 2003).

Despite the progress that has been made over the last 20 years, strengthened by legislation, new regulations and technology, and other activities, there remains a crucial need to further reduce exposure to hazards found on the job (NIOSH, 2006). Future prevention prospects for improving health and safety in the workforce can be heavily influenced by the PtD initiative. Previous applications of engineering controls have consistently yielded measurable gains for particular industry problems (Donham and Thelin, 2006). For example, there is the successful experience of Scandinavian countries with a policy approach to controlling tractor fatalities. The adoption of similar policies, that mandate proven safety improvements in farm, forestry and fishing vessels, vehicles and equipment, may have potential for reducing the burden of injury and illness.

On the other hand, previous research suggests that prevention results are poor when using traditional safety and health training to control injury and disease (Hartling et al., 2004). These efforts put the burden of safety and health on workers, rather than on better design of work environments, processes, or procedures. There is renewed evidence from studies in agricultural safety, however, that training can play an important role. Under certain conditions, and in combination with other activities (i.e. when new controls are introduced, or as part of a hazard identification inspection and control program), training can be beneficial (Gadomski et al., 2006).

2. Most Compelling Idea/Recommendation to Come Out of the Discussions

The most compelling idea/recommendation that came out of the discussions was that a few promising solutions and problem-

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solving directions were repeated. For example, the interest in getting better designed tools in the hands of workers was a recurring theme. A few ideas like this one introduced during the session on practices turned out to have correspondingly interesting policy, research, and education components. In addition, there appeared to be at least the potential for similar applications to succeed in each sub-sector and industry (agriculture, forestry, and fishing).

3. Practice (Needs, Challenges, Opportunities)

There was repeated emphasis, in each of the sector discussion groups, on the importance of finding ways to get a new generation of tools, equipment, and facilities that have been designed with prevention in mind, into the hands of the agriculture, forestry and fishing workforce. Some of the new ways to accomplish this include: enlisting market forces through the creative use of checklists, offering comparative ratings of the safety and production features of different equipment manufacturers, and including more safety, human factors, and ergonomics in design guidelines and standards. The general idea in all these cases is to increase available information to the buyers, so they can more easily compare products and buy the safest, most productive, equipment items and tools. If buyers become aware of, and demand more, safety features, the tool and equipment manufacturers will be forced to consider and compete on human factors, ergonomics, maintainability, and safety features, as well as the more traditional production performance-related features. There was also recognition that, by definition, performance and production gains would accompany greater attention to human factors and ergonomics. The immediate need is to identify appropriate independent groups and sources of funding for comparative ratings of major tool and equipment items, especially items with typically long service lives. Some interest was expressed in investigating ways to expand the purview of the Nebraska Tractor Tests, which now include noise exposures for the equipment operator and bystanders, along with standard machinery performance and efficiency measures.

4. Policy (Needs, Challenges, Opportunities)

In the sector discussion groups, there was a sense that policy level deliberations and decision making tended to exclude effective participation by workers, as well as owners and managers from small- to mid-sized operations. To overcome these barriers we suggest: information dissemination through worker and industry organizations and training for employees and others from smaller enterprises so they can be empowered to become part of the decision making process. The goal is to modify the process so the small holders can interact on a more equal level with the larger stakeholders (see [Note #1](#)).

One specific policy idea demonstrated an innovative way to encourage both improved forestry workforce safety and better forestry management of public lands by state and federal land managers. The Sustainable Forestry Initiative, a green program intended to encourage conservation, requires private sector

forest managers to prepare certified logging plans, and to attend training courses on developing the plans. These training courses already include some occupational injury PtD concepts. The effort seems to be starting to work in the private sector, but there is less incentive for public sector land managers to either prepare plans or participate in the training. This can change if a new policy, instituted as part of the Sustainable Forestry Initiative, required (or gave incentives to) state and federal land managers to participate in the training and plan preparation. The result can benefit forestry worker safety and health, forestry sustainability associated with logging on state and federal lands, and simultaneously benefit the taxpayer with better managed and more productive public forest land (see [Note #2](#)).

5. Research (Needs, Challenges, Opportunities)

Our discussion group felt that there are already many ideas and a good amount of research available about possible new products designed with prevention in mind. The bottleneck appears to be obstacles associated with moving research to practice. Efforts to commercialize possible product ideas are often difficult and poorly done. Our Agriculture, Forestry, and Fishing discussion group urged increased partnering with private industry to facilitate better commercialization of ideas, encourage more research, and produce results with prevention built in. Sources for potential partners include university-based academics and research cooperatives, government agencies, nongovernmental organizations, industry trade organizations, unions, and end users.

One potential barrier when partnering with private industry is protecting against the perception, and sometimes the reality of, a conflict of interest. This can be an obstacle when government researchers and officials work directly with individual firms from private industry. One idea to avoid the problem is to develop evaluation tools and new methods that are then made publicly available. Another idea is finding ways to partner with independent groups, so no single firm, or group of firms, within an industry, would gain unfair advantage. A practical way to organize and fund the research cooperatives would be to use manufacturer trade organizations to levy voluntary commodity taxes. These taxes can be paid by the firms which benefit from the research results (see [Note #3](#)).

6. Education (Needs, Challenges, Opportunities)

One innovative suggestion with considerable promise is to encourage the development of easy to “embed” single lessons, or short modules, on forestry job layout and work practices, which combine prevention and work efficiency. The modules can be offered during continuing education training courses that are currently run by logging councils for logging crew foremen. At present, these crew foremen, as well as the individual loggers in each crew, actually design and carry out work on a day-to-day basis. Unlike traditional safety training, these lessons can help loggers better design tasks, and become more knowledgeable about the safest, most productive ways to accomplish their work (see [Note #4](#)).

7. Conclusions

There were a number of remarkable features to the Agriculture, Forestry, and Fishing session. Among them was how quickly the participants rediscovered both their breadth and diversity, and shortly afterwards, their common interests. At the opening, there were clear divisions denoting what portions of this large economic sector the various participants represented — some from forestry, some with more expertise in fishing, others most familiar with production agriculture. But participants also noted great similarities in the structure within each sub-sector (i.e. operations ranging in scale from the lone operator to 1,000 employees, dangerous work, and poor enforcement of protective health regulations). These, and other realizations about commonalities, were quickly recognized and encouraged the participants to unite to work through ideas that could have widespread potential and benefits.

The session ended with a shared sense that PtD could prove to be more than just a useful concept. In addition, all the group's participants agreed to work on further problem solving, as is realistically possible in light of their current duties.

References

- Donham, K., & Thelin, A. (2006). *Agricultural medicine: occupational and environmental health in agriculture for the health professions*. Iowa City: Iowa State University Press.
- Executive Office of the President, Office of Management and Budget (2002). *North American Industry Classification System, United States*. Baton Rouge, LA: Claitor's Publishing Division.
- Fleming, L. E., Gomez-Marin, O., Zheng, D., Ma, F., & Lee, D. (2003). National Health Interview Survey mortality among US farmers and pesticide applicators. *American Journal of Industrial Medicine*, 43(2), 227–233.
- Gadomski, A., Ackerman, S., Burdick, P., & Jenkins, P. (2006). Efficacy of the North American guidelines for children's agricultural tasks in reducing childhood agricultural injuries. *American Journal of Public Health*, 96(4), 722–727.
- Hartling, L., Brison, R., Crumley, E., Klassen, T., & Pickett, W. (2004). A systematic review of interventions to prevent childhood farm injuries. *Pediatrics*, 114(4), e483–e496. doi:10.1542/peds.2003-1038-L.
- National Institute for Occupational Safety and Health (2006). *Executive Summary: NIOSH Agriculture, Forestry and Fishing Safety and Health Program prepared for the National Academies Review*. <http://www.cdc.gov/niosh/nas/agforfish/pdfs/AFFfrontMatterNAS12-06.pdf>
- National Safety Council (2007). *Plain Facts About the Agricultural Industry*. <http://www.nsc.org/issues/agri/indus.htm>. accessed August 10, 2007.
- Saarni, S. I., Saarni, E. S., & Saarni, H. (2007). Quality of life, work ability, and self employment: a population survey of entrepreneurs, farmers and salary earners. *Occupational and Environmental Health* (Electronic publication ahead of press PMID: 17666452).
- United States Department of Labor (2007). *Bureau of Labor Statistics*. <http://www.bls.gov/oco/cg/cgs001.htm>. accessed August 10, 2007.

Notes

- Note #1. Further details and examples about new practices that couple safety and performance: Brad Husberg (bjh9@cdc.gov) for fishing, and Giulia Earle-Richardson (gearlerichardson@nycamh.com) for agriculture.
- Note #2. For details building on the Sustainable Forestry Initiative, consult with John Garland (garlandp@peak.org) and Bob Rummer (rummer@fs.fed.us).
- Note #3. Contact John Garland (garlandp@peak.org) for further information on research cooperatives.
- Note #4. For details about logging council crew foreman training, contact Bob Rummer (rummer@fs.fed.us).