132.

SELF-REPORTED MUSCULOSKELETAL SYMPTOMS AMONG OPERATORS OF FARMING EQUIPMENT. N. Kittusamy, NIOSH, Spokane, WA; A. Mayton, D. Ambrose, NIOSH, Pittsburgh, PA.

Farm workers are often afflicted with musculoskeletal symptoms that compromise their health and well-being. However, there have been few formal studies of the nature and potentially preventable causes of these symptoms. The purpose of this study is to determine the percentage of musculoskeletal symptoms among these workers. A questionnaire was designed to assess demographics, work information, job history, and musculoskeletal symptoms in operators of heavy construction equipment. Information concerning equipment included design of the seat/chair, levers, and pedals; bothersome vibration; quality of egress from the equipment; proper preventative maintenance and repairs; and age of equipment. The data were collected through focused group meetings with the farm workers. The body regions that were evaluated included the neck, middle/upper back, low back, shoulder/upper arm, elbow/forearm, wrist/hand, hip, knee, and ankle/foot. Fifty workers out of 60 (83%) completed the questionnaire. The operators averaged 48 years of age and 33 years of experience. Majority of the operators indicated that the cab (i.e., seat/chair, levers, and pedals) was adequately designed for their job. The operators reported that they were sometimes bothered by vibration and that the quality of egress from the equipment was good. Most of the operators indicated that proper maintenance and repairs were performed on their equipment. The classification of equipment as being old or new was almost identical. Seventy percent of the farm operators experienced musculoskeletal symptoms of one or more body parts. These results indicate that these workers are at risk for developing musculoskeletal disorders; there is a need to perform a larger survey to further substantiate the outcome; and there is a need to quantify risk factors (i.e., whole-body vibration and static sitting postures).

Podium 118. Lead

Papers 133–138

133.

THE SUCCESSFUL USE OF SANDBLASTING TO REMOVE LEAD-BASED PAINT IN THE INTERIOR OF A HISTORICAL BUILDING. S. Sperber, University of Delaware, Newark, DE.

This presentation will discuss the occupational health and safety challenges of removing several layers of lead-based paint from a historic, century old building that is being adapted for use as an art gallery.

This facility, Mechanical Hall, located on the University of Delaware Campus in Newark, was built in 1898 to house the Mechanical and Electrical Engineering Departments and, later, the campus's Army ROTC. In 2001, the University decided to renovate the building as the permanent home of the Paul R. Jones Collection of African-American Art. The building will also provide research and office spaces for the gallery staff members.

One of the chief elements of the architect's vision for the renovation involved revealing and restoring the building's original heavy timber support structure, wooden deck, and brick walls to their original condition. Unfortunately, the interior painted surfaces contained many layers of paint with high percentages of lead. The University's Department of Occupational Health and Safety was challenged with preparing specifications for the safe removal of the lead-based paint—one that would guarantee minimal damage to the wooden surfaces.

The traditional paint removal technique (chemical paint strippers) was not effective in removing all of the layers of paint, and its use would have been too time consuming to meet time constraints for the project. The University's OHS Department determined that this would be the perfect opportunity to be unorthodox and sandblast the interior painted surfaces of the building. The building was unoccupied due to the renovation, so the entire building could be sealed and maintained under negative pressure. Through sample testing it was determined that sandblasting off the paint would meet the stringent restoration requirements of the project.

This presentation will discuss the criteria used in contractor selection, health and safety measures, area/personal air sampling, and management of waste during the project.

134.

HANDWIPE DISCLOSING METHOD FOR THE PRESENCE OF LEAD. K. Ashley, M. Boeniger, CDC/NIOSH, Cincinnati, OH; E. Esswein, CDC/NIOSH, Denver, CO.

A new National Institute for Occupational Safety and Health method for detecting lead contamination on surfaces is described. A wetted wipe is used to collect dust on surfaces that potentially contain lead. Lead in dust collected on the wipe is extracted using an aqueous acidic solution, such as diluted acetic acid (vinegar) or highly diluted nitric acid. The wipe is then treated with an aqueous solution of rhodizonic acid in order to test for the presence of lead. A characteristic color of pink or red is indicative of a positive test for lead. The procedure is best performed using spray bottles containing extraction solution and indicator solution, respectively; a fine spray is preferred. The estimated identification limit of the method, when using vinegar for extraction, is about 10–15 micrograms of lead per wipe sample. Matrix effects and potential interferences must be taken into consideration when using the procedure. As a screening technique, the method is suitable for testing surfaces such as floors, walls, window sills, car interiors, and skin. The method is especially useful for detecting the presence of lead on skin and assessing the effectiveness of hand washing in removing lead from the hands of exposed individuals. Also, the method is particularly useful in field evaluation for the presence of lead in dust, and the effectiveness of its subsequent removal in the workplace, home, school, or other environments.

135.

ULTRASONIC EXTRACTION/ANODIC STRIPPING VOLTAMMETRY FOR DETERMINING LEAD IN DUST: SUMMARY OF A LABORATORY STUDY. W. Rossiter, Jr., B. Toman, M. McKnight, I. Emenanjo, M. Baghai Anaraki, NIST, Gaithersburg, MD.

Results of previously published laboratory studies have suggested that ultrasonic extraction/anodic stripping voltammetry (UE/ASV) may be a suitable method for on-site lead extraction and quantitative lead analysis of dust wipe samples. Nevertheless, such on-site extraction and analysis using UE/ASV are not currently incorporated in federal programs for controlling and abating lead hazards in housing. A reservation to adopting UE/ASV is that the effect of the field operator (i.e., the analyst) is unknown. The availability of a reliable operator-independent field test procedure for determining the amount of lead in dust could allow for on-site extraction and analysis. This paper reports on a HUD-sponsored study to evaluate the effect of an operator when certified lead risk assessors or inspectors trained to conduct UE/ASV analyses performed such analyses of laboratory-prepared dust wipe specimens using field-portable apparatus. Four operators each analyzed 160 dust wipe specimens (640 specimens total) following a test protocol that was developed in accordance with the instructions for field use of the UE/ASV apparatus. The dust wipe specimens were prepared using four commercial wipes spiked with one of six lead-containing certified reference materials. The amounts of lead spiked onto the wipes ranged from 40 ug to 2000 ug. After UE extraction, the resultant solutions were either filtered or not filtered before conducting the ASV analyses. The presentation reports the results of the analyses. Among the key findings was that an operator effect was observed. This effect was essentially associated with three of the operators determining higher lead recoveries than the fourth. Possible reasons for the operator effect are discussed.

136.

MEASURING CONTAMINATION OF SURFACE METALS IN A RADIATION ONCOLOGY FABRICATION LAB. M. Tortora, Hartford Hospital, Hartford, CT.

Many different metal parts are fabricated in an RO fabrication lab. This manufacturing process involves the melting, drilling, and

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