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surveillance protocol they routinely use. During a 24-month period beginning September 2007, three pre-formatted questions were incorporated into PCC screen-based data-entry forms used during telephone consultations. These questions systematically solicited documentation of links between reported exposures and production agriculture. Six PCCs serving four southeastern states (Alabama, Kentucky, Virginia, and West Virginia) modified their Toxicall® data collection software to include three new questions to ask during a pesticide exposure's initial report. The modified software recognized 39 predetermined agriculture-related TESS database pesticide codes. Entry of these codes triggered a text box prompting specialists to ask additional study questions. Questions and corresponding answers became part of the permanent medical record. Preliminary results for the first 19 months (Sept. 1, 2007 – April 31, 2009) indicate that the software modification increased pesticide exposure documentation precision and detail. Of 5,414 calls received involving study pesticides, the enhanced protocol solicited additional information for 185 cases (3.4%). Of cases that asked the study questions, 12.97 % (n = 24) had exposures linked to agricultural activities. In conclusion, the software modification developed for this study enhanced information routinely collected by PCCs and identified pesticide exposures that occurred during agricultural work. Prevention strategies to protect agricultural populations from pesticide exposures can be developed with improved information about exposure circumstances.

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Reducing Pesticide Exposures: The Oregon OSHA Experience

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In a concerted effort to reduce pesticide exposures in Oregon, Oregon OSHA launched the Pesticide Emphasis Program (PEP) in FY 2000. Oregon OSHA is a state-plan state and has promulgated its own regulations for Agriculture under Oregon Administrative Rules 437, Division 4. Oregon OSHA is unique as an OSHA state plan in that it also has full enforcement authority of the EPA's Worker Protection Standard and enforces pesticide issues in the agricultural setting. This enforcement authority was coordinated through Memorandums of Understanding with the Oregon Department of Agriculture. EPA Region 10, Pesticides Division has oversight authority over the pesticide program through an unfunded agreement with Oregon OSHA. Oregon OSHA's PEP applies the following regulations which encompass the various ways in which pesticide exposures can occur: the Worker Protection Standard, Hazard Communication, Respiratory Protection, personal protective equipment, pesticide storage, emergency eyewash, fumigation requirements, Thiram requirements, and supervision. From enforcement activities to consultation interventions, to stopping by Oregon OSHA's booth at the various trade shows, agricultural employers receive the necessary information to protect not only their workers, but the farm owner as well. The PEP includes an annual report which summarizes not only the enforcement activities, but the agency wide efforts to provide education, training, outreach through consultations, speaking engagements, conference booths, publications and AV distribution. This report allows the agency to develop publications to address frequently cited areas, and to devote focused training in those areas. As a result, the allocation of resources is effectively targeted.

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Provider Survey of Reporting Laws for Pesticide Exposure in Texas

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Since 1987, DSHS Pesticide Exposure Surveillance in Texas program (PEST) has received funding from the National Institute for Occupational Safety and Health (NIOSH) under SENSOR cooperative agreements to conduct surveillance of occupational pesticide exposures. In 2004, PEST started including disinfectant exposures in its surveillance and acquires most of these data from reports to Texas Poison Centers. While reports of disinfectant exposures have risen dramatically, reports of agricultural exposures have diminished. Underreporting is likely the case, so PEST decided to conduct a pilot survey of providers to gauge their knowledge of reporting laws in Texas. DSHS PEST acquired mailing addresses for 2,500 emergency room and occupational health providers from the Texas Center for Health Statistics and mailed letters asking if they would take a short informational survey about their knowledge of pesticide poisoning and the reporting laws for occupational pesticide exposures. They were asked to take the survey online; however, for their convenience, a copy of the survey also was included in the letter so that the survey could be faxed back to DSHS PEST. The survey included five questions that required either or a yes or no answer: 1) Do you and your staff know that Texas law requires you to report a suspected pesticide exposure to the state health department (800-458-7269)? 2) Do you and your staff know that you can also report that exposure to the Texas Poison Center Network (800-222-1222)? 3) Do you and your staff know that a disinfectant (including chlorine) is legally considered a pesticide? 4) Do you and your staff know how to identify a possible pesticide exposure? 5) Do you or your staff ever run tests on patients with possible pesticide exposures (e.g., cholinesterase or urinary metabolite tests)? Only 78 (3 people) percent responded to the survey. Eighteen percent of the surveys were completed online, 10 percent were mailed to DSHS PEST, and 72 percent were returned by fax. Of those providers who responded, 28 percent were aware that they were required by law to report occupational pesticide exposures; 54 percent were aware that they could use the Texas Poison Centers for reporting a pesticide exposure; 15 percent knew that disinfectants were considered a

pesticide; 77 percent felt confident that they knew how to identify a pesticide exposure; and 38 percent had run diagnostic tests to identify type of exposure. These data, while limited, indicate that providers in Texas are not aware that disinfectants are considered pesticides or that pesticide exposure is a reportable condition. DSHS PEST conducts educational campaigns in at hospitals and in the community, but these data suggest that alternative forms of interaction and education may be necessary to inform providers of pesticide exposure reporting requirements in Texas.

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Violations of Federal and State Pesticide & Pesticide-Related Personal Protective Equipment Standards among Agricultural Employers in Oregon

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The objectives of this study are to quantify and characterize violations of federal and state pesticide-related personal protective equipment (PPE) standards among randomly selected Agricultural workplaces in Oregon from 1999 to 2008. We analyzed data from the Oregon OSHA Pesticide Emphasis Program in over 500 pesticide-related inspections in Oregon from 1999–2008. All inspections were conducted randomly within major groups of the industry as targeted by the Pesticide Emphasis Program. Violations included non-compliance with specific standards of both the EPA Worker Protection Standard (WPS), including respiratory and non-respiratory PPE requirements, and the Oregon OSHA PPE standards. The following items will be analyzed and reported: 1) trends in the number and rate of EPA WPS violations and separately in Oregon OSHA PPE violations over time, controlling for the types of Agricultural Industry included which varies from year to year-violation rates will be calculated as the number of violations divided by the number of inspections; 2) a description of the types of violations and their seriousness and any changes in their prevalence over time; and 3) rates of violation recurrence within a workplace. All analyses will be presented in the poster. By addressing the study objectives, we will better understand the extent to which Agricultural workplaces in Oregon comply with state and federal pesticide-related PPE standards and the types of non-compliance that occur. The study addresses the Personal Protective Technology Program's PPE Surveillance in Agriculture effort to characterize PPE use among agricultural workers in order to better address their occupational safety and health needs.

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Practical Solutions for Minimizing Agricultural Worker and Family Exposure to Pesticides

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The purpose of this study is to promote practical and proven solutions for minimizing pesticide exposure in agriculture. The objectives are to identify, document, and evaluate unique solutions for pesticide safety measures developed and used in Washington tree fruit orchards. These orchard-developed interventions are relevant to the user and encourage adoption by other orchards. This project is part of a larger investigation that is developing, evaluating, and distributing pesticide safety measures that will minimize agricultural worker and family exposure to pesticides. Key to the overall project is collaboration of the research team with the Expert Working Group (EWG). This group, comprised of orchard managers, pesticide handlers, and specialists in agricultural safety, brings the knowledge of orchard practices and production to the project. Potential practical solutions were identified by contacting: orchards recommended by the EWG and colleagues in the agricultural community; as well as recipients of agricultural safety awards. The solutions were documented by observation, photographs, and interviews with managers and pesticide handlers. The solutions are being evaluated for uniqueness (not in common use); practicality (compatible with work practices, affordable, and convenient); and safety (does not create another hazard or increase pesticide exposure). Summaries of each solution are being evaluated by pesticide handlers and crew foreman, the EWG, orchard managers, and agricultural safety professionals. The pesticide handler and crew foremen evaluation takes place through an interactive presentation/survey in Spanish language sections of agricultural conferences. Proposed solutions are presented in Power Point and participants respond to the questions using a direct audience response system. The other target groups are completing an evaluation survey. Twenty-two practical solutions have been documented. Results from crew manager and pesticide handler evaluation are presented. Evaluation results are used to inform the selection of practical solutions and safety measures to be included in a manual and website.

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Pesticide Interactions and Risk to Agricultural Workers

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Human health risk assessment and the subsequent risk communication to end users are based largely on studies on surrogate animals. With regard to worker protection in agriculture such studies are deficient in several respects.