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Western Center for Agricultural Health and Safety • University of California, Davis

Integrating occupational and health promotion in the ag workplace

By Marc Schenker, M.D., MPH, director of WCAHS

For many years, agriculture has maintained an exception to many occupational health and safety efforts in the workplace. Today many distinctions still exist between agricultural and non-agricultural workplaces.

The agricultural workplace focuses on agrochemicals, respiratory hazards, infectious agents and ergonomic stresses. However, the overall health of ag workers is influenced by factors inside and outside the workplace. For example, stresses faced by low-income immigrant workers may have an influence on their overall health. Unhealthy diets and limited exercise may contribute to many adverse conditions, including obesity, diabetes and cardiovascular disease. Poor living environments may also affect the health of agricultural workers. Finally, poor healthcare access and limited education can further exacerbate the overall health of agricultural workers.

Over the past few years, occupational health professionals have recognized that a new, more integrated approach is necessary to improve worker health. This effort considers the health of workers from an occupational and non-occupational perspective. The overall benefits are potentially enormous in reduced health-care costs, increased worker satisfaction and reduced worker turnover. This new approach has been primarily developed in traditional workplaces, but it is time to expand it to the agricultural setting.

Challenges include the hiring of farm workers by labor contractor intermediaries, mobility of the farm worker population, cultural and language differences, poverty of farm worker families, and suspicion of any interventions in populations that can include undocumented workers.

Nevertheless, it is possible to develop integrative approaches to work in healthcare among farm workers. For example, we are currently working with one large grower to evaluate an intervention that has been developed to reduce the risk of obesity and diabetes. The material was developed for use by urban dwellers, but they have been converted for use by rural, farm worker populations. This effort is a collaboration between the grower and the University of California, and involves multidisciplinary approaches to improving the health of the workforce. It specifically addresses approaches to improve nutrition and increase exercise among farm workers.

Companies outside the agricultural world have come to realize the benefits of health promotion activities in their workforce. It is time for agricultural employers to similarly recognize these benefits. This may be particularly critical at a time when reduced immigration is putting a stress on agricultural employers to find adequate numbers of experienced workers.

An integrated approach to occupational health and health promotion is a classic win–win situation. Employers win because of a healthier, more satisfied and effective workforce, and improved health translates into improved quality of life. It makes no sense to reduce respiratory toxins in the workplace and do nothing about cigarette smoking at home. Improving the health of workers should address both of these exposures, and success will benefit everyone involved.

Ergonomic winegrape picking tub: 10-year analysis

By Theresa Kiehn, Program Manager, AgSafe

In the months of August and September, AgSafe, in partnership with the National Institute for Occupational Safety and Health (NIOSH), conducted a survey of winegrape growers and farm labor contractors regarding the use of a smaller, 46-pound winegrape picking tub.

Theresa Kiehn was guest speaker in Oct. at WCAHS' monthly seminar.

This project builds upon the work initially conducted by the University of California Agricultural Ergonomics Research Center – *Vineyard Ergonomics Project*. The smaller winegrape tub was introduced 10 years ago and is meant for a 46-pound load, as opposed to conventional tubs that carry a 57-pound load. Today, NIOSH is interested in learning how widespread bin usage has been, the employee safety and economic benefits to using the bin, and how the bin could be improved in the future.

AgSafe distributed surveys to all its members, all registered Farm Labor Contractors in California,

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Health effects of airborne particulate matter in the Central Valley

By Francesca Perrone

For those who live in California's Central Valley, "Spare the Air Days" has meant free bus rides in the summer, no fires in the fireplace in the winter and staying indoors. However, many people do not realize that these days of predictably bad air quality are brought on by weather inversions that cause stagnation events. These events cause a buildup of tiny particulate matter that floats around in the atmosphere and can cause potential health problems. Of particular concern are particles smaller than 2.5 micrometers in diameter, known as "fine" particles which are so small that they can be inhaled deep into the lungs. Kent Pinkerton, director of the Center for Health and the Environment and associate director of WCAHS, has been studying the effects of particulate matter and pollutants on the lungs for many years. Pinkerton has been investigating the consequences of inhaling fine and ultrafine particles of less than 100 nanometers (3,000-4,000 of these can fit across a single strand of hair) in agricultural settings, and has ventured into the world of nanotechnology to determine potential respiratory health concerns.

Particulate matter sampling equipment

Sampling in a residential location of Fresno, CA.

The Central Valley not only supplies a large proportion of the food across the United States, but it's also home to many residents in the surrounding communities. Agricultural activities create an extraordinary amount of dust, and particulates from diesel engines, wood smoke, smelting of metals and pesticide application further contribute to the high levels of particulate matter in the air. One of Pinkerton's recent studies involved exposing rats to high concentrations of particulate matter (at two different times during the year) in Parlier, a town in the southern portion of the Central Valley near Fresno. The study found that atmospheric particles affect the respiratory system, and they may also negatively impact other parts of the body,

Continued at right

Ergonomic winegrape picking tub *from page 1*

all regional and statewide winegrape-growing trade associations, all county Farm Bureaus and other interested groups, including members of the Wine Industry Officers of Safety (WINOS) and the Agricultural Safety Resource Alliance (ASRA). A sampling of results from those who participated follows:

- 45% of survey participants are using the 46-pound picking tub
- 60% have been using the picking tub for 3 to 10 years
- 85% reported providing the tub for employees the following harvest season after learning about the benefits of employee safety
- 43% modified the tub. The majority of modifications included adding PVC piping to the handle for comfort and ease of lifting
- 53% reported the tub was a positive investment while 47% were not certain if it was a positive investment

During her "Smaller Grape Harvest Tubs – A Survey 10 Years Later" seminar presentation on Oct. 4, AgSafe Manager Theresa Kiehn began by introducing from the audience the project originator John Miles (center). She invited him to give the group a little background, and he obliged. Seated on his right is Professor Gang Sun of the UC Davis Department of Textiles, and on his left, grad student Dvera Saxton, who is currently working in Watsonville.

The next phase of the project will focus on developing business cases for underutilized and successfully adopted design solutions. In order to accomplish this, NIOSH will be conducting interviews with the original tub study participants and current tub users to collect data on employee health improvements, cost benefits and tub modifications to improve the tub for broader use. Additional steps will include coordinating efforts with manufacturers to improve design and developing marketing efforts on benefits for improved usage by the winegrape industry.

For additional information, please contact AgSafe at 209-526-4400 or e-mail safeinfo@agsafe.org

Particulate matter *from page 2*

such as the brain. These findings are significant, particularly because of the potential of particles to travel from the nose to the brain. If pesticide particulates are able to adhere to fine dust and become airborne, it is possible that farm workers and members of local communities may inhale these particles.

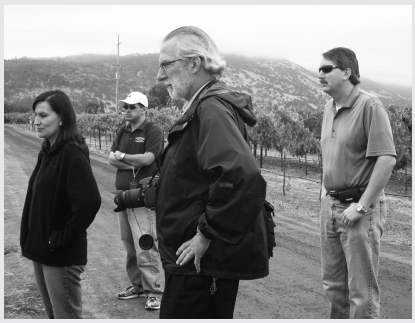
In light of this finding, Pinkerton also conducted a study in cooperation with the Kearney Agricultural Center in Fresno to further measure the potential of particles to affect the brain. Although the results have not displayed specific adverse effects from the inhalation of particles, significant increases have been found in the number of certain molecules involved in stress or damage. Pinkerton notes that these factors may be especially serious in people whose health has already been compromised, such as those with respiratory or cardiovascular problems. Also, young children and the elderly should take precaution, particularly on "Spare the Air" days.

Laurel Plummer, a pharmacology and toxicology graduate student with Pinkerton, has been examining the health effects of airborne particulate matter in the southern portion of the Central Valley for her dissertation research. Plummer's research focuses on examining the consequence of inhaling particles over time, depending on season, particle composition, size and location (orchards, vineyards, dairies, and rural and urban communities).

In her study, mice were exposed to different levels of concentrated ambient air at the different locations to reproduce "bad air" days. Interestingly, the concentration of particles did not seem to have any potentially negative health effects, but differences in season produced an effect. Typically, one would think that the time of year with the highest production of agricultural dust, therefore having the most significant effect on the lungs, would be during harvesting in the summer months. However, these studies found that winter exposure created the greatest indication of damage and stress to the lungs. This suggests that the driving environmental factor could either be the source or the chemical composition of certain particles, or both. For example, during winter months, particle generation from wood smoke is much higher than in summer months – a different source as well as a different composition. To further understand why the winter months caused these results, current and future research revolves around determining the chemical composition of the ambient air and investigating the age and sources of the particles.

Discovering the sources of potentially harmful particulate matter could be beneficial toward reducing emissions. Even though it's nice to have free public transportation on "Spare the Air" days, it would be even nicer if we could spare our lungs instead of hiding inside all day.

NORA AgFF meets in Davis



On August 3-5 WCAHS hosted the NIOSH National Occupational Research Agenda's (NORA) Agriculture Fishing and Forestry (AgFF) Sector Council meetings at the Hyatt Place, UC Davis. Two days of meetings led by Co-chair George Conway, M.D., MPH, CDC/NIOSH AgFF program manager and chief of the Alaska Field Station, were followed by an ag safety tour in the Napa Valley. In the vineyard on the left: Host Stan Zervas, viticulturist and Silverado Farming Company (SFC) vice president, talks to Claudia Castello/SFC HR manager; Chad Sanborn, intern in Alaska from Project UMHOTE, Hawaii; Dr. Schenker; and Mike DeSpain, John Deere Co. At right, Trish Danby, safety director for Diageo Estates facilities provided a tram ride and tour of Sterling Winery and explained their successful employee safety program.

Schenker receives award for excellence in scientific writing

Marc B. Schenker, M.D., MPH, received the Jean Spencer Felton Award for Excellence in Scientific Writing from the Western Occupational Medical Association.

Schenker received the award at the association's annual conference on Oct. 1 in Newport Beach, Calif. The association bestows the award annually to the author of a book, journal article or other written work important to the field of occupational health.

The articles by Schenker noted by the association included:

- "Reproductive and Other Health Effects of Semiconductor Work: The Semiconductor Health Study," *American Journal of Industrial Medicine*
- "Residential Proximity to Naturally Occurring Asbestos and Mesothelioma Risk in California," *American Journal of Respiratory and Critical Care Medicine, and*
- "A Global Perspective of Migration and Occupational Health," *American Journal of Industrial Medicine.*

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Calendar of Events

December 6

Pam Tau Lee, Public Programs, Berkeley School of Public Health, will present "Participatory Community-based Research: Immigrant Worker," at WCAHS Seminar Series, 4–5 p.m., Hart Hall, UC Davis Campus

January 10

WCAHS Graduate Student Presentations: Hong Xiao, Epidemiology; Johnny Garcia, Ag & Environmental Chemistry; and Chris Carosino, Environmental Toxicology will speak during WCAHS' Seminar Series, 4–5 p.m., Hart Hall, UC Davis Campus

February 7

George Conway, M.D., MPH, director of the CDC/NIOSH Agriculture, Forestry and Fishing Program and the CDC/NIOSH Alaska Pacific Regional Office, will give a presentation at WCAHS' Seminar Series, 4–5 p.m., Hart Hall, UC Davis Campus

The 2010 WCAHS seminar series is available via video webcast at http://agcenter.ucdavis.edu/seminar/webcast_2009.php

WCAHS is co-sponsor of: