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

Methyl bromide alternatives toward a fumigation-independent future

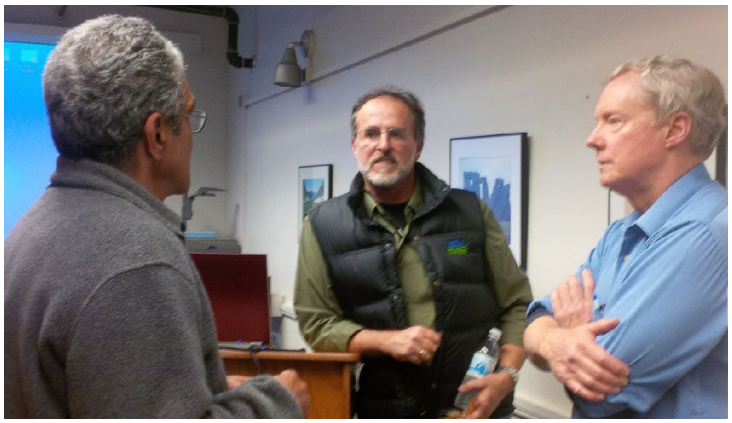
When a WCAHS seminar topic centers around methyl bromide and the guest speaker is an expert on the subject, attendance peaks. In March, Daniel Kluepfel, Ph.D., a research plant pathologist and research leader of the USDA Agricultural Research Service (ARS) at the University of California, Davis, joined us to discuss "The case of methyl bromide alternatives: Progress towards a fumigation-independent future."

Methyl bromide (MeBr) is an odorless, colorless gas that has been used as a soil fumigant and structural fumigant to control pests across a wide range of agricultural sectors. While MeBr was technically phased out of use in 2005 by the EPA, some California strawberry fields can still be treated with it under the critical use exemption. However, MeBr costs have been increasing (est. $3,000-$4000 an acre), and its use in strawberry production has been decreasing (CADPR 2011), but its use in California, the nation's leading producer of strawberries, has been a controversial topic for decades.

Currently about 68 percent of the California strawberry acreage is fumigated with alternatives to methyl bromide, primarily drip-applied mixtures of 1,3-D plus chloropicrin (InLine, Pic-Clor 60) or chloropicrin emulsified formulation (Pic-EC) (CADPR 2011). Drip fumigation with these products cost less than broadcast shank fumigation with methyl bromide plus chloropicrin. However, there are limits to how much of the remaining 32 percent of the strawberry acreage can be converted from methyl bromide to alternative fumigants. Fumigants are difficult to apply evenly by chemigation on hilly fields where beds are not formed along contour lines. Also, all fumigant applications are restricted or not allowed within one-quarter mile of a sensitive site, such as a hospital, jail, school or day-care facility (VCAC 2011).

The public has shown less and less tolerance toward agricultural fumigant use, and regulators have been forced to look for solutions that meet the demands of the public, yet allow growers to farm. One strategy to reduce the potential for fumigant exposure from

Methyl bromide *continued on page 3*



Josh Johnson, CalDPR environmental research scientist (left), March seminar guest speaker Daniel Kluepfel, Ph.D. (center), and Chuck Salocks, CalEPA-OEHHA.

RURAL AMERICA
California Drought 2014

Rural Migration News http://migration.ucdavis.edu/rmn/ summarizes and analyzes the most important migration-related issues affecting immigrant farm workers in California and the United States during the preceding quarter. Topics are grouped by category: Rural America, Farm Workers, Immigration, Other, and Resources. The following article, by Philip Martin, is excerpted from the April 2014 issue:

The 2014 drought aggravated poor air quality in the San Joaquin Valley, giving Fresno its worst winter air ever as storms failed to clear out pollution and left residents breathing fine PM-2.5 particles. Despite significant improvements in air quality over the past decade, the California Air Resources Board estimated that only three-fourths of the four million San Joaquin Valley residents live in areas whose air meets federal health standards for ozone.

Drought 2014 *continued on page 2*

Employment. Projections of how many farm jobs may be lost due to reduced water supplies are made by estimating how much farm revenue is likely to fall and how many farm jobs are associated with each $1 million in reduced farm revenue. When the amount of water falls, farmers normally switch scarce and expensive water from lower-to-higher value crops, as from hay and pasture to perennial trees, vines and vegetables. These higher value crops tend to be more labor intensive.

Farmers said that farm revenues could fall by up to $3.5 billion in 2014 due to the drought. Other estimates foresee a smaller reduction in farm revenues, but all expect some reduction in farm revenue and employment.

Housing. California Rural Legal Assistance (CRLA) released a study in March 2014 that found many farm workers live in overcrowded and substandard housing. The study concluded that local authorities sometimes do not enforce housing regulations for fear of displacing workers and their families. Most farm workers live in cities, but some live in disadvantaged, unincorporated communities (DUCs) that often lack water and sewer connections.

Some of the roots of poor farm worker housing today lie in efforts to improve on-farm housing in the 1970s and 1980s. Unions and activists decried on-farm housing, saying that it gave farm employers "control" over their employees, since workers who went on strike could lose their jobs and their housing. Instead of improving housing, many farmers eliminated on-farm housing as standards rose and enforcement increased, pushing farm workers into nearby cities and forcing them to incur travel costs to get to work.

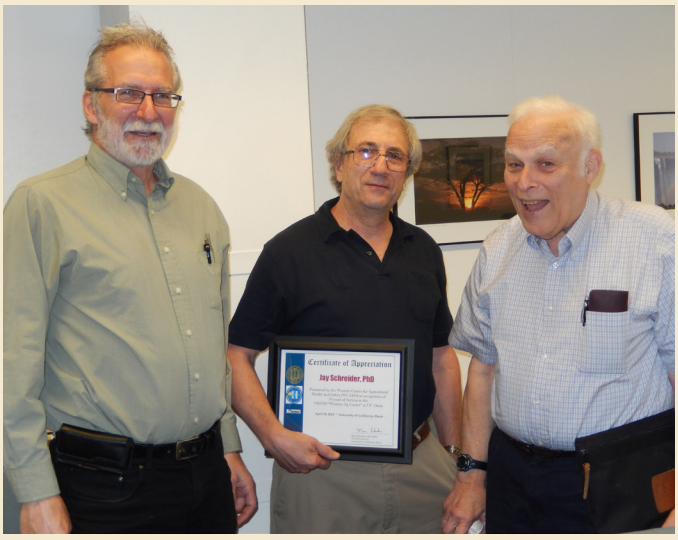
Napa County has three farm worker centers, Calistoga, River Ranch and Mondavi, each with 60 beds for solo men that offer room and board for $13 a day. Napa vineyard owners who do not provide housing to farm workers pay a $10 per-planted acre tax, or almost $450,000 a year to cover the $13 a day deficit for each worker at the centers. The centers have a budget of $1.2 million for 2014-15.

Santino Garcia of the California Human Development Corporation, which manages the centers for the Housing Authority, notes that FLCs sometimes direct groups of men to seek housing in the Napa centers. CHDC, which does not allow FLCs to reserve beds and accepts workers on a first-come, first-served basis, said that the three centers were mostly full in 2013. CHDC believes that many of the workers at Calistoga and Mondavi are from San Joaquin Valley counties as far away as Fresno, while many River Ranch workers are from nearby Napa and Sonoma.

USDA is subsidizing an $18 million housing development in Calistoga that will include 47 farm worker units. Farm workers will pay up to 30 percent of their incomes in rent.

California, with an estimated 2.5 million unauthorized foreigners, will begin issuing special driver's licenses to them by January 2015. Some 1.4 million unauthorized foreigners are expected to apply by providing official identification to prove their identity. Migrant advocates want the Department of Motor Vehicles to accept identification cards from day laborers' associations, immigration rights groups and other local groups, but critics say that these cards are easily obtained and could invite fraud.

Phillip Martin is a professor of agricultural and resource economics at UC Davis, and editor of Rural Migration News.



Jay Schreider, newly retired primary state toxicologist, center, is presented with a Certificate of Appreciation for his valuable contributions over many years serving on the WCAHS' Steering Committee. The award was presented by Dr. Marc Schenker (left) and Jerry Last, during WCAHS' quarterly "Investigators, Students and Staff" meeting on April 29, 2014.

Jay Schreider recalls, "I started working with the center in 2001 as a liaison from the California Department of Pesticide Regulation. One of my goals was to foster more scientific interaction between the center and the department. Over that time, I have appreciated the commitment of Marc Schenker and the other center investigators to furthering the safety and general well-being of people involved in agriculture. That is why I will remain involved with the center, though in a different capacity, following my recent retirement from state service."

Some California strawberry fields can still be treated with methyl bromide under the critical use exemption.

off-site movement of volatile fumigants is the use of barrier films, which trap the fumigant in the field (Fennimore et al. 2013).

Daniel Kluepfel and his colleagues are developing alternative solutions to soil fumigants, and working to modify the natural microbiology in the soil to suppress disease-causing agents. Bioinformatics is key to understanding the complex microbial communities involved in this process. Dan Kluepfel also is working with the USDA-ARS National Clonal Germplasm Repository to screen the walnut germplasm collection for disease-resistant host genotypes. Breeding new disease-resistant strains rootstocks could drastically reduce the need for chemical agents in the growing process, but will take time to successfully implement as a growing practice. Kluepfel is hopeful about the impact this project will have on reducing the need for preplant fumigation in the future.

The response he has seen from growers to new information and practices is one of the best aspects of doing agricultural work in California. Kluepfel is pleased that growers are so quick to pick up new practices when proven effective.

For more information, Daniel Kluepfel can be reached at dakluepfel@ucdavis.edu.

References

[CADPR] California Department of Pesticide Regulation. 2010 Annual Pesticide Use Report. 2011. www.cdpr.ca.gov/docs/pur/pur10rep/comrpt10.pdf (accessed May 1, 2012).

Fennimore, et al. (2013) California Agriculture TIF film, substrates and nonfumigant soil disinfestation maintain fruit yields 67(3):139-146. DOI: 10.3733/ca.v067n03p139. July-September 2013.

[VCAC] Ventura County Agricultural Commissioner. Fumigant Use Regulations 2011. http://ceventura.ucdavis.edu/Com_Ag/comveg/Strawberry/Recent_Meetings/Fumigants_4_11/ (accessed May 1, 2012).

Health effects of particulate matter discussed at April seminar

Co-Investigators Kent Pinkerton and Keith Bein, presented preliminary findings and future goals of the research project titled, "Health Effects of California Agricultural Particulate Matter (PM)" on April 7.

In addition to sampling particles in real-time, seasonal sampling (summer and winter) allowed them to demonstrate differences between biomass burning, vehicular emissions and metals for both respiratory and cardiovascular endpoints in laboratory studies. Future goals include identifying sources of agricultural PM producing the greatest health impact and determining the importance of particle size on observed allergic response. In regard to EPA regulations, Keith Bein noted that risks are not all the same, but they are regulated as if they are. A favorable outcome of their study could be to lower regulations on the least toxic and raise them on the most.

The Pinkerton-Bein April 7, 2014, Power Point can be viewed at: http://agcenter.ucdavis.edu//seminar/webcast.php

From left, Kent Pinkerton, Keith Bein, and WCAHS Seminar Program Chair James Seiber, professor emeritus of environmental toxicology.

In Memoriam

Barry William Wilson

Since the era of environmental awareness dawned in the early 1960s, ecotoxicologist Barry Wilson has been at the forefront of new discoveries and understandings as a prominent member of the faculty of the UC Davis College of Agricultural and Environmental Sciences. When he died at age 82 on March 28, he left a remarkable legacy of scientific accomplishment with a strong imprint in crop management, and food and farm worker safety.

Professor Barry Wilson was one of the first research project investigators for the "Ag Center" at UC Davis. He is credited with developing standardized clinical cholinesterase testing while studying the negative impact of pesticides on the environment and in the development of cells.

"I was saddened to hear about Barry's death," said Marc Schenker, M.D., MPH. "He was one of the original faculty investigators of the Ag Center. He made very important contributions to the center and, more importantly, to improving the health of agricultural workers. His work epitomized translational research, going from the bench top to the field, to regulatory agencies. He was also a colorful person who kept perspective, not to mention a sense of humor, about him."

Wilson earned a bachelor's degree in liberal arts from the University of Chicago in 1950, and around this same time he learned how to play jazz piano, a passion he carried throughout his life. Although he was torn regarding potential careers as a reporter or jazz pianist, he ultimately decided to pursue a life of science.

He received his doctoral degree in 1962 and was hired into the Department of Poultry Husbandry at UC Davis. He remained at UC Davis for his entire career and was just planning to retire from animal science and environmental toxicology. A memorial service is planned for June 14, 2014, at the Unitarian Church of Davis.

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Calendar

Please join us for a special seminar event on

Monday, June 2, 2014, 4:00 – 5:00 p.m., C.H.E. Board Room on Old Davis Road

Bruce Goldstein, President of Farmworker Justice Organization, Washington, DC, a national advocacy, litigation and education organization for migrant and seasonal farmworkers, will present "Federal policy impacts on farm workers' wages, working conditions and immigration status."

Goldstein has been a leader in advocating for immigration legislation, reforming the agricultural guestworker program and improving enforcement of labor protections.

WCAHS Seminars will resume in October

Join the AgHealth e-mail listserver

The Western Center for Agricultural Health and Safety's AgHealth e-mail discussion group is open to anyone interested in agricultural health and safety. We welcome and encourage participation by posting comments or questions about agricultural health and safety. Subscribe at the WCAHS homepage: http://agcenter.ucdavis.edu, click on "AgHealth email List."

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