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Heat 2007: Dealing with Old Risks and New Law

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As agricultural activity gets into full swing in most parts of the country, California growers and workers will be facing a familiar problem in a changed legal context. A permanent state regulation designed to reduce risks from excess heat in outdoor workplaces took effect mid-summer last year. While people in agriculture have long coped with heat in various ways, the new rule requires that employers take some specific measures to help workers control heat stress and get timely care when showing signs of heat-related illness.



So besides their and employees' exposure to the old risks of heat build-up causing discomfort, illness, injury, and operational disruption, agricultural employers are now subject to penalties for not meeting terms of the new standard. They soon may be joined in this respect by all other California employers. A bill moving through the Legislature this year, AB 1045, would require the state Occupational Safety and Health Standards Board to adopt a similar regulation applicable to indoor workplaces by July 2008.

Heat that accumulates in the body raises internal temperature, threatens normal functioning, and triggers natural processes to release the excess. Both the heat itself and the body's cooling mechanisms can eventually cause symptoms recognized as a "heat illness," a condition that impairs physical or mental functioning. Heat stroke, the most serious such illness, is a medical emergency. Although less critical ailments -- heat exhaustion, heat syncope (fainting), heat cramps, and heat rash -- are not immediately life-threatening, they reduce well-being and performance, and they can progress to stroke.

Even pre-illness effects of excess body heat and the loss of fluid through sweating to get rid of it may cause serious damage. Relatively subtle discomfort, weakness, blurry vision, slowed reactions, diverted attention, lapses of



concentration or judgment, reduced coordination, and irritability add to chances of workers doing things that not only hurt themselves but also translate into higher production costs. Heat stress is under-credited as a causal factor to such incidents as falling off a ladder, cutting a

finger, driving a tractor into a ditch, mis-calibrating a chemical solution, or picking a fight.

Basics of the Heat Illness Prevention Standard

The new rule formally entered the California Code of Regulations on July 27, 2006, as section 3395 of Title 8, Chapter 4, Subchapter 7, Group 2, Article 10. The Heat Illness Prevention (HIP) standard applies to all outdoor workplaces, all the time. In brief, it requires employers of people who work outside to provide four things: (1) one quart of drinking water per person-hour for the entire work shift, (2) a shaded rest area and the opportunity to use it for 5 minutes or more, (3) training on a specific set of topics for all employees, and on an additional two for supervisors, and (4) written documentation of procedures to be followed in complying with the regulation.

Definitions in the regulation text itself and interpretations in a Q&A document from Cal/OSHA explain these requirements and are guiding enforcement personnel. Regarding the drinking water, unless a plumbed or other continuous supply is readily available to workers, the whole amount is to be provided in portable containers either at the beginning of the shift or in stages through a reliable system of replenishment that allows all employees to drink at least one quart per hour. Employers are considered out of compliance if at any time no drinking water is available, or if the replenishment practice is to wait until either the container is empty or employees request more water. Cal/OSHA sees a replenishment system as unreliable if employees feel pressured to reduce their water consumption in order to conserve for later in the day.



Shade, according to the regulation, is blockage of direct sunlight. It can be made by buildings, canopies, awnings, “pop-up” or other temporary structures, and even trees.

One indicator of blockage adequacy is that “objects do not cast a shadow in the area of blocked sunlight,” but a shaded area that is too hot to allow the body to cool does not meet Cal/OSHA’s standard. Access to the shade is to be permitted at all times to any employee “suffering from heat illness or believing a preventative recovery period is needed” (including before the onset of any symptoms).

Required topics for training content are listed in the standard. While training methods are not, Cal/OSHA guidance says that evaluation of compliance will also depend on manner of presentation, and that enforcement personnel will quiz employees in assessing whether an employer has made a good faith effort to convey essential content.

The topics specified for coverage in training for all employees are:

- Environmental and personal risk factors for heat illness
- Importance of frequent water consumption, especially when weather is hot and sweating is more than usual
- The importance of acclimatization
- Common signs and symptoms of different heat illnesses
- Importance of immediately reporting to employer, directly or through a supervisor, signs of heat illness in self or in co-workers
- Employer’s procedures for responding to symptoms
- Employer’s procedures for contacting and transporting to emergency medical care
- Employer’s procedures for clearly directing emergency responders to the worksite
- Employer’s other procedures for complying with this standard

Two more to cover with supervisory employees are:

- Procedures to follow in implementing the heat illness prevention plan
- Procedures to follow in responding to employee symptoms of possible heat illness

Finally, the documentation of compliance and response procedures is to be made available to employees and to enforcement personnel upon request. It may be kept as a stand-alone policy but probably is best integrated into the employer’s overall written injury and illness prevention program.

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The permanent standard and the temporary regulation that preceded it were enforced last year through both Cal/OSHA inspections, most of which were driven by complaints and reported accidents, and area-industry sweeps by the state Economic and Enforcement Employment Coalition (EEEC). Inspections in 2006 yielded a total 108 citations for violations of section 3395, including 55 serious. The most commonly cited violation (more than 60%) by far was failure to train employees. Second most common was lack of a written compliance plan. Stepped up enforcement this year is expected to target areas in which heat waves are forecast.

Meeting Challenges on the Ground

Like most law, the HIP standard applies to people in a broad range of circumstances. It is not tuned to differences across agricultural sectors, geography, and time. The measures it prescribes are based on sound principles, but their utility varies quite a bit with workplace conditions. The North Coast vine trainer in April – to say nothing of the outdoor ski-lift operator in January – does not have the same needs to drink, cool, and know about heat stress as the Central Valley melon harvester in August.

Section 3395 explicitly spells out obligations presenting legal risks that employers can stay clear of by making reasonable efforts. Achieving the real purpose of the regulation, however, is another matter. Complying with rules of the state by no means assures success in battle with physiological processes. Even dutifully following HIP requirements where they address actual needs cannot eliminate the chance of workers being harmed. The regulation leaves to the employer many choices that largely determine how well the old (non-legal) risks are controlled.

There is no substitute for informed, careful decisions within the legal bounds, and many agricultural managers have been making them with eyes on both the purpose and the letter of the HIP standard. I have heard about and personally seen several creative adjustments in provision of water, shade, and education that help protect employees and effectively equip them to make and act on their own risk-reducing decisions.

A vineyard operator, for example, has modified the metal "igloo" cradle that normally attaches to a gondola during harvest so that it can be removed easily and placed to free-stand in the row and serve workers when the filled gondola departs. While awaiting the next gondola, workers have continuous ready access to the igloo, and they take good advantage of it. A row-crop labor contractor has similarly reduced workers' "cost of access" to drinking water without any such bar bending or welding. He simply instructed crew foremen to frequently drive the igloo-carrying pickup truck close to the ever-moving center of work activity throughout the day, and he explained why.

Many growers and contractors have purchased pop-up canopies, umbrellas, and camp awnings to provide portable shade. Some have fashioned awnings that attach to trucks or other equipment. The principal of a large labor contracting firm based in the Southern California desert region has literally raised shade to a new level by designing a one-axle trailer that integrates two large fold-up shade screens, a table, igloo frames, and a stack of plastic chairs. Nearly all of his crews are outfitted with one of these portable structures, and on warm days crew members usually spend all their break time in the shade it creates. Even more important, some crews spend their work time in the shade of a tarp stretched over the full width of a the field packing machine at the center of their melon harvest.

The most consequential element of the HIP standard, in my view, is the training requirement. And despite its specificity about content topics, it is also the element



presenting the most questions about how to comply. By what method(s) is training to be provided? By whom? Where? When? To what depth? Using what materials? None of these has a universally right answer, of course, and each could be the subject of an entire article. In concluding this one, I want only to make a brief pitch for more depth. The array of references and instructional aids supporting workplace education about heat stress physiology has expanded in recent years. And, as numerous agricultural safety professionals have found, there is much to be gained by drawing from it to present workers and supervisors with explanations beyond the usual litany of cautions, commands, and assorted mantras.

Controlling heat stress is a team sport. Managers, front-line supervisors, and workers themselves all make decisions that affect exposures to heat-related risks. Knowledge of some basic underlying physiology is key to their making good ones. If hard working production employees do not drink as much water as they need, it is typically because they do not appreciate the value of replacing lost body fluid and because they experience relatively high physical, social, and/or economic costs in getting to water that is provided. Without knowing the “why” behind exhortations to drink water frequently, workers are neither as equipped nor as motivated as they could be to do their part in combating heat stress, and supervisors are less apt to assist them with logistical support, information, and personal example.

So managers can effectively promote better hydration and other self-care measures by helping workers as well as supervisors learn how the body generates and copes with excess heat. In the accompanying box is a list of ten key points that I suggest trying to convey by whatever means possible. They can be delivered and discussed in orientations, tailgate meetings, and company handbooks. A large collection of other references is available online at <http://tinyurl.com/27czuv>.

Key Points about Heat Stress

1. Functions of the human body depend on blood circulation and chemical reactions that best occur at about 98.6 degrees F. Your body has natural ways of gaining or losing heat to maintain that “normal” temperature.
2. The main source of heat that may stress you is your own body. In using its stored energy for physical work, about three-fourths of the energy turns into heat, only one-fourth into motion. An active body usually generates more heat than it needs and therefore has to release some.
3. The harder you work, the faster you generate heat, and the more your body has to get rid of. Hot weather, high humidity, and insulating clothes increase your risks of stress mainly by slowing the transfer of excess body heat to your surroundings.
4. When you produce heat that raises internal temperature, your heart rate quickens and vessels expand to bring more blood to the outer layers of skin, from which heat it carries can gradually flow to the environment.
5. If excess heat is not released fast enough this way, your sweat glands become more active. They draw water from the bloodstream to make sweat that carries heat through pores and onto your skin surface, where it evaporates and releases the heat.
6. When more blood flows toward your body surface for cooling, less is available to serve your muscles, brain, and other internal organs. And as prolonged sweating draws water out of the bloodstream, it further reduces capacity to deliver nutrients, clear out wastes, lubricate joints, and cool you later. You can expect to sweat out one quart of water or more during an hour of heavy work in hot weather, 3/4 quart during moderately strenuous work.
7. Continual loss of water makes you increasingly likely to experience symptoms of “heat illness” – general discomfort, loss of coordination and stamina, weakness, poor concentration, irritability, muscle pain and cramping, fatigue, blurry vision, headache, dizziness, nausea, confusion, and unconsciousness. These and even milder effects of heat stress also increase your chance of accidental injury.
8. The single most important way to reduce heat stress risks while working is to steadily replenish the water you lose as sweat. Drinking small amounts frequently, such as 6-8 ounces every 15 minutes, is more effective than taking large amounts less often.
9. Relying on thirst as the signal to drink is dangerous. Most people do not feel thirsty until their fluid loss reaches 2% of body weight and is already affecting them.
10. If you notice heat illness symptoms, rest to stop generating heat, get fluids, and tell a supervisor as soon as possible. A person whose fluid loss is 8% of body weight is likely to have a core temperature above 104 degrees and serious risk of heat stroke – a life-threatening emergency in which the brain is deprived of oxygen and the body can no longer cool itself. Please don’t let yourself or a co-worker get to this condition. But if you do, call for medical help right away.

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