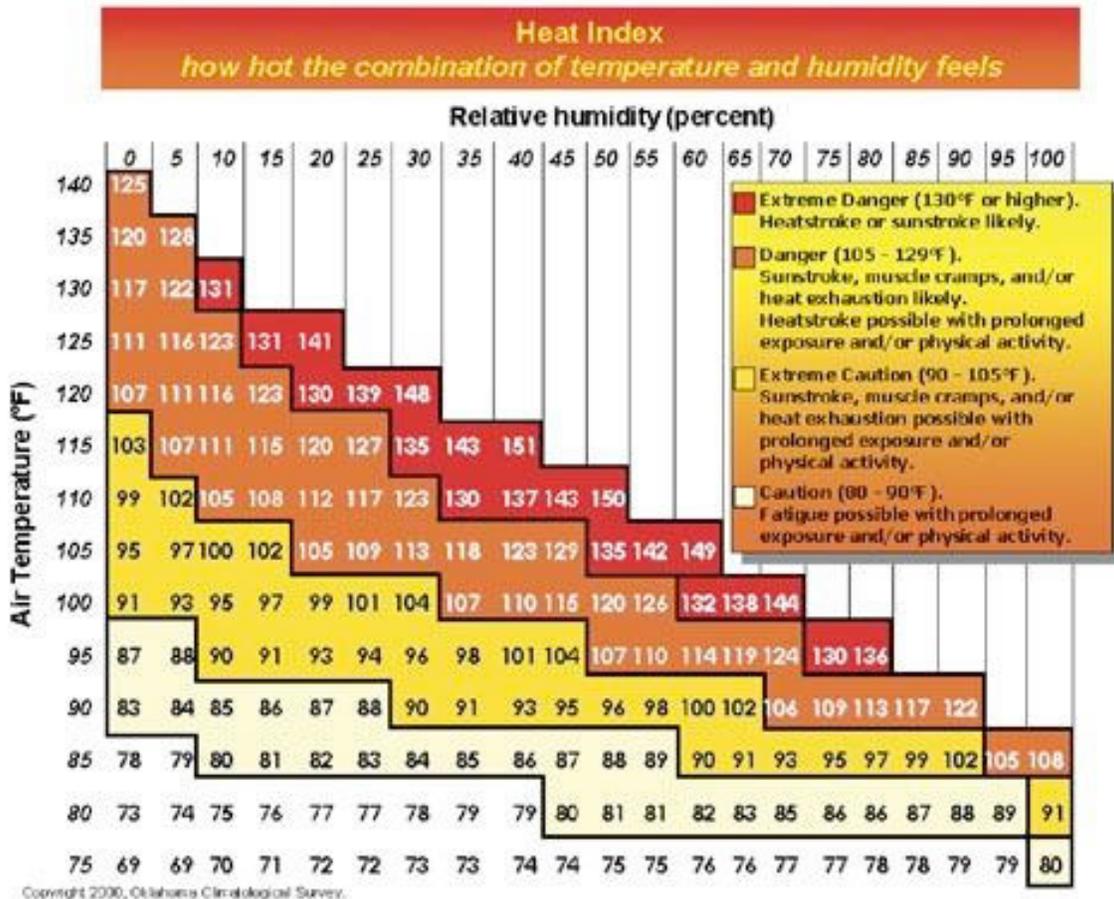


# GOOD FRUIT GROWER

July 1st, 2007  
Vol. 58 No. 12



## HOT TIPS on heat stress

*They can save a life.*

By Helen Murphy, Pacific Northwest Agricultural Safety & Health Center

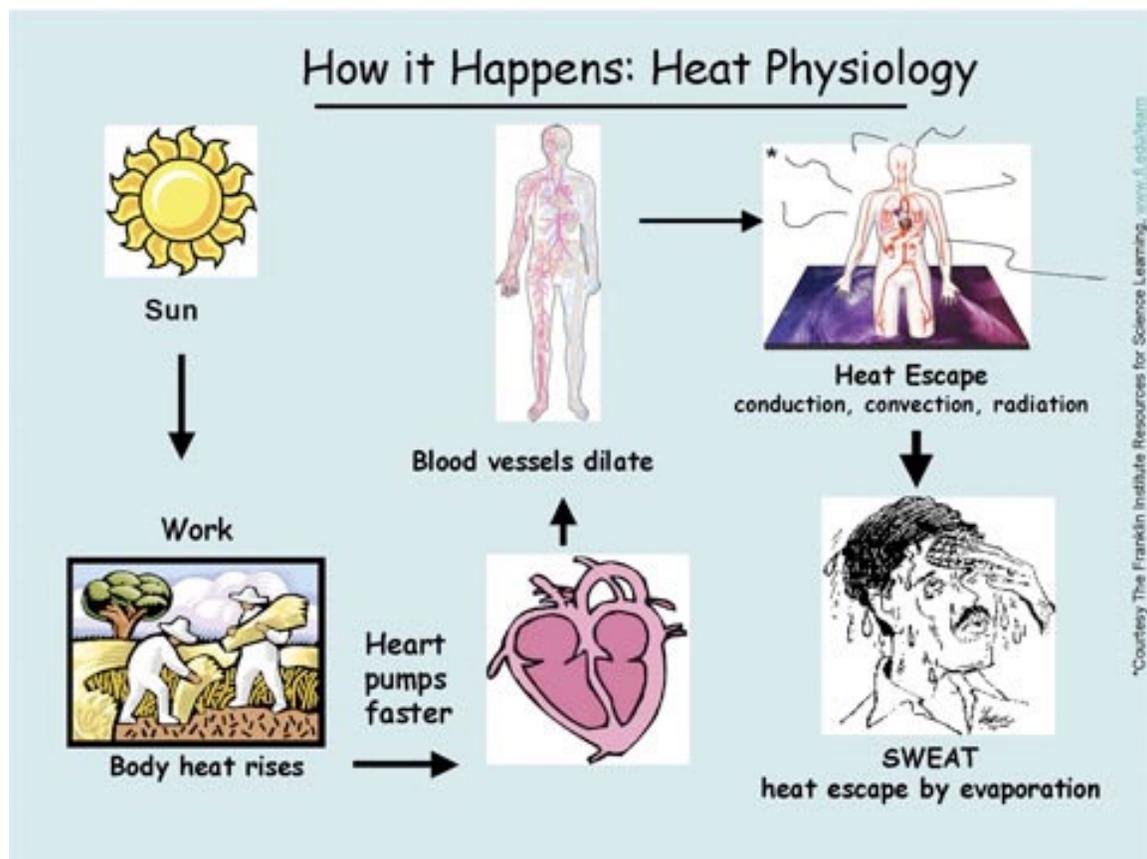
Two Washington State agricultural workers have died of heat stress in the past decade.

In one case, it was mid-May and about 78°F in Yakima. A 35-year-old worker started his job at 9 a.m. By early afternoon, he complained of feeling tired. As he went to lie down, he suddenly collapsed, became delirious, and had a seizure. His recorded temperature in the emergency room was 111°F. The cause of death was heat stroke.

Chances of survival are pretty good if the body temperature is lowered to at least 102°F within 30 to 60 minutes. The worker described above probably died because of the intensity of his temperature.

Many cases of heat illness are misdiagnosed. By the time workers reach an emergency room, their temperature may have fallen enough that heat illnesses aren't suspected. Symptoms may be misclassified as those of a heart attack. Less severe cases may never get reported because workers don't recognize heat-related illnesses or don't want to let their teammates or employer down.

Heat stress is a build-up of heat from the body's own work plus external (environmental) sources. If more heat is generated than can be released, you become heat stressed. A heat-related illness results when the body can no longer cope. The body's physical and mental functions break down. The heart responds to a rise in body temperature by pumping more blood to peripheral vessels, which enlarge or dilate to release heat. If that isn't enough, you will start sweating to cool down by evaporation.



#### Four illnesses

- Heat cramps. Athletes are familiar with this syndrome, caused by salt depletion. It is easily treated with rest and electrolyte-balanced fluids such as sports drinks. You could also drink plain water and eat salty chips or nuts. Avoid salt tablets because of the risks of overdosing.

- Heat syncope (fainting) happens when blood pools in the legs, often after standing too long. It is temporary. Being horizontal usually prompts a return to consciousness. The biggest risk is an injury from falling. To help blood return to the heart, elevate the person's legs and cool his or her body with wet compresses and vigorous fanning. Turn the unconscious person on his or her side to prevent choking. However, if the person has been working hard, consider it heat stroke, call 911, and check the airway, breathing, and circulation, and start CPR accordingly. Cool victim down immediately by any method. Anyone who faints should be medically evaluated and not returned to work.

- Heat exhaustion is more serious and is caused by severe dehydration. Symptoms can include fatigue, dizziness, nausea, and vomiting, plus early neurological signs such as headache, impaired judgment, and anxiety.

Classically, exhaustion causes profuse sweat and cool, clammy skin. Move such a person out of the heat, provide fluids as tolerated (sips of a sports drink if available), strip off any extra clothing, and cool the person by wetting clothing and fanning him or her. Medically evaluate the victim.

- Heat stroke is a medical emergency. It can look like exhaustion except that the body temperature is 104°F (40°C) or higher, and the brain is seriously affected. Neurological effects can include confusion, irrational or aggressive behavior, incoherent speech, collapse, convulsion, and coma. When the body's heat coping mechanisms have failed, sweating stops, and the skin becomes red, dry, and hot to the touch. Call 9-1-1, then use any means possible to lower the body temperature and do it quickly. Ice baths are safe and the most effective means. Otherwise, strip off extra clothing, soak, and vigorously fan as described above.

### Environmental conditions

There are three ingredients: temperature, high humidity, and the absence of air movement. Humidity was a factor in the case above, because the worker was in an irrigated area. High humidity reduces the body's ability to get rid of excess heat by sweating and so increases the apparent temperature (see figure "Heat Index" on facing page).

Machinery can add to the sun's heat.

### **Seven steps for prevention**

1. Assess your own risks: You and your workers must educate yourselves on the risk factors so you can proceed with greater caution when the heat index is high. Any illness or medications that dehydrate you can set you up for a heat illness. You should make yourself and your workers aware of the drugs, diet, medications, and illnesses that can make you susceptible. Especially, look out for elderly workers on those hot days.

2. Assess the environmental conditions: When the heat index is high, shift your work hours to the cooler times of day.

3. Ensure acclimatization: New employees or those off work for two weeks or more should follow a five-day period of acclimatization.
4. Drink enough: Good hydration is the key to prevention. Workers may not want to stop work for water or toilet breaks, either because they are working piece rate or do not want to let their team members down. Remember the half-half-rule: one half liter or one half quart (that's one pint) every one half hour. How do you know if your fluid intake is adequate? If you stop urinating or your urine is dark, you're not drinking enough.
5. Rest in the shade: Good managers should insist on breaks not only for cool-down periods but also to encourage a culture of rehydration and toilet use.
6. Wear light, breathable clothing and hats: Some workers may wear excess clothing to protect themselves from the sun. In the summer of 2004, a person working in hops who was found dead from heat stroke was wearing dark leather-like personal protective equipment over layers of clothing. Changing this concept will take some creative education, but this worker could serve as an example.
7. Learn to recognize heat-related illnesses: If you can spot those early symptoms, you can respond quickly enough to save lives. Encourage a buddy system for remote work locations.

For more information and illustrations, including a chart explaining the signs and dangers of heat illness, which can be printed out as an educational tool, go to the Good Fruit Grower Web site at [www.goodfruit.com/gfgpdfs/Heat\\_Illness\\_Table.pdf](http://www.goodfruit.com/gfgpdfs/Heat_Illness_Table.pdf).

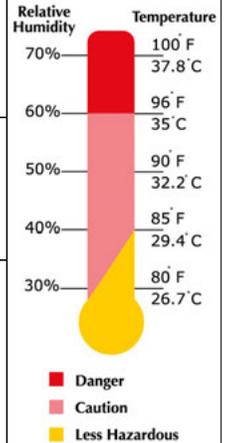
# Heat Illness - Know the Signs and Dangers

## What are the Dangers of Heat Stress?

	Heat Cramps	Heat Syncope (Fainting)	Heat Exhaustion	Heat Stroke
<b>Description</b>	A temporary fluid and electrolyte imbalance- salt depletion in conditions of heavy physical exertion	Pooling of the blood in the lower extremities in unacclimatized workers who are required to stand in the heat for long periods of time.	A reduction of body water content or blood volume. It occurs when the amount of water lost (as sweat) exceeds the volume of water taken in during the heat exposure.	Body fails to regulate core temperature. Sweating slows or stops completely preventing the body from releasing the excess heat.
<b>Symptoms</b>	Painful muscle spasms in the arms, legs, and abdomen	A brief loss of consciousness. <b><i>In a worker who is performing any substantial labor, consider it HEAT STROKE, call 911, and cool down immediately by any method.</i></b>	Profuse <b>excessive sweating, cool clammy pale skin,</b> weakness and fatigue, dizziness, nausea and vomiting, <b>weak rapid pulse</b> and early neurological symptoms (e.g. headache, anxiety, or impaired judgment)	Same as heat exhaustion + core body temperature >104°, <b>altered mental status</b> (irrational behavior, psychosis, aggressive behavior, incoherent speech), the skin can be hot, flushed, pulse may be bounding and rapid.
<b>Consequences if Untreated</b>	May be accompanied by heavy sweating and thirst, heralding impending heat exhaustion.	Loss of consciousness regained once the person falls to the ground. Watch for injuries secondary to falling.	If left untreated may rapidly progress to HEAT STROKE and subsequent death.	Loss of consciousness, coma, organ failure and death.
<b>Treatment</b>	Rest in a cool environment. Give fluids and salty foods or an electrolyte solution such as sports drinks. Salt tablets are not recommended due to the risks of overdosing.	Keep the individual lying down with feet raised, cool with wet cloths and ventilation, provide fluids and then move to a cooler location. Do not return to work and refer for medical evaluation.	Transfer to a cool shaded place. Cool body with wet clothes and ventilation. Replace water and salts; a good source for both are sports drinks. Transfer to a medical facility for evaluation.	<b>Call 911!</b> Cool down the body immediately with every available means- most effective is a ice water bath or wet down entire body with copious amounts of water and vigorously fan.



High Temperature  
+ High Humidity  
+ Physical Work  
= Heat Stress



## Combat these dangers with three steps:

### 1.

#### Hydrate

Adequate hydration is the most important step to combating heat stress. When the heat index is high, workers should drink copious amounts (1 quart every hour) frequently throughout the work shift: they should consume at least one cup every 15 minutes or a pint every half hour - in order to stay properly hydrated. Workers should be trained not to wait until they feel thirsty to drink; if they are thirsty they may already have lost 2% of their body's water. The onset of heat exhaustion can begin after losing 3% of the body's water and heat stroke occurs once 8% is lost. The bottom line is, if a worker is not regularly urinating or has dark urine, they are dehydrated and at risk for heat illnesses!

### 2.

#### Assess

Assess the relative danger of the worksite. Be aware that high heat, high humidity, low air circulation all create a more dangerous working environment. Any time more than one of these variables is present, the danger is compounded. Wearing occlusive non-breathable clothing in combination with heavy exertion compounds these worksite risks and can alone lead to heat illness.

### 3.

#### Acclimate

If an employee is new to a job or is returning after time away: ease them back into full-time work over the course of 5 days. Starting at half time (50% effort) and increasing to full time (increase by 10% each day) can greatly reduce the employee's susceptibility to heat stress.

#### Heat Stress Resources

- WA Labor and Industries:  
<http://www.lni.wa.gov/safety/topics/AtoZ/heatstress/>
- OR OSHA:  
[http://www.cbs.state.or.us/external/osh/subjects/heat\\_stress.htm](http://www.cbs.state.or.us/external/osh/subjects/heat_stress.htm)
- OSHA:  
<http://www.osha.gov/SLTC/heatstress/>
- CDC:  
<http://www.bt.cdc.gov/disasters/extremeheat/>
- WA SHARP Program:  
<http://www.lni.wa.gov/Safety/Research/Focus/default.asp>