

It's no secret that farmers and agricultural workers are very vulnerable to the consequences of heat and sun exposure.

Heat stroke, the most serious heat illness, can be fatal. Exposure to heat can also lead to heat exhaustion, heat cramps and heat rash.

Dr. Chandran Achutan, Associate Professor, Department of Environmental, Agricultural and Occupational Health at the College of Public Health, University of Nebraska Medical Center (UNMC), says recognizing the potential for heat stress is an important step in helping to prevent it.

"It's important to evaluate your work environment," Achutan says. "Some environments are hot and dry, others are hot and wet. Hot, dry environments include those with radiant heat sources or high temperatures, with little water vapor in the environment. In this type of environment, the body cools itself through perspiration."

Hot, wet environments have significant amounts of water vapor, which doesn't allow the body to cool by sweating. Heatstroke can result in body temperatures of between 104 and 106 degrees. Nerve cell tissues are most vulnerable to heat. The brain is comprised almost entirely of nerve cells, which means cognitive mental impairment may be an initial sign of heat stroke.

"When body temperature exceeds 104 degrees, a person is likely to become unconscious or experience convulsions," Achutan says. "They're also likely to stop sweating."

The high body temperature causes increased blood flow to the skin, putting a strain on the heart. If the person is heavily sweating, that further stresses the heart.

Symptoms of rising internal body temperatures include

- • hot, dry skin
- • profuse sweating
- • chills
- • throbbing headache
- • poor coordination
- • slurred speech
- • vomiting
- • hallucinations
- • fainting or collapse

"The person experiencing heat stroke may exhibit irrational behavior, poor judgement or confusion," Achutan says. "Heat stroke is a medical emergency and you should seek medical attention immediately."

Heat stroke victims need to cool their body core any way possible, as quickly as possible. Cold packs on the neck, armpits and groin, along with use of wet towels or sheets to cover the body will assist in reducing body temperature. Along with damage to the brain, kidneys can be damaged by the occurrence of heat stroke. Left unattended, a heat stroke victim can experience permanent disability or death.

“Move them to a cool area and, if they are conscious, give them electrolyte replacement drinks,” Achutan says. “You must also immediately seek medical help.”

In cases of heat exhaustion, body temperatures are slightly elevated, up to 102 degrees. The victim may experience headache, nausea, dizziness and extreme fatigue.

“Heat exhaustion can be caused by salt or water depletion,” Achutan says. “The condition can be reversed by allowing the body to cool and be hydrated. It’s best to seek medical attention for

heat exhaustion as a victim needs to be acclimatized over a period of 5 to 7 days.”

If heat exhaustion occurs, the victim should get out of the heat, remove any excessive clothing, especially around the head and neck, slowly drink a liter of water. Lying down with the feet elevated and using a fan to aid in cooling will help until medical assistance is available.

Heat cramps can occur when the same muscles are used repeatedly while working in the heat. Severe muscle spasms can occur under these conditions.

“Heat cramps can occur when someone is sweating and large amounts of water are consumed without replacing salts,” Achutan says. “The condition can be treated with rest and electrolyte replacement with a product like Gatorade.”

Heat fatigue and heat rash are less serious conditions, but they indicate over exposure to heat.

Weather conditions that can set the stage for heat-related illness include high temperature and humidity in combination with limited air movement.

Workers who are directly exposed to the sun, have low fluid intake and are not accustomed to working in hot environments are at high risk for heat-related illness.

“Workers with heavy, protective clothing are also at risk for heat-related illness,” Achutan says.

Preventing any form of heat stress is the best approach to managing this illness. Wearing light clothing made of natural fibers and staying hydrated are among the key steps to avoid over-heating.

“Drink lots of fluids if you’re working in high temperatures,” Achutan says. “Depending on the type of work being done, long sleeves may be necessary. Take breaks in a shady area, and whenever possible, rest in an air conditioned environment.”

Four steps can help workers “beat the heat.”

1. Before work begins, drink up to 16 ounces of water.
2. While you’re working, don’t wait until you’re thirsty; drink water every 15 minutes, consuming a quart of water every hour. Caffeinated and sweetened beverages are less helpful than “sport” drinks that contain electrolytes. Never drink alcohol as it dehydrates the body.
3. Take adequate rest breaks to allow your body to recover from heat and give your body a chance to cool down.
4. Find a shaded or air conditioned area for rest breaks. When working in a field, a tent can provide the necessary shade.
5. If you’re not accustomed to working in hot conditions, take several days to acclimate yourself to the high heat. If you’re away from a hot work area for more than four days, it will be helpful to take time to rebuild heat tolerance.
6. Whenever possible, avoid exposure to the sun between 10 a.m. and 4 p.m. During the hottest hours of the day, avoid working in confined spaces. Schedule those types of activities early in the morning or later in the evening when temperatures begin to cool.
7. If personal protective equipment is uncomfortable, frequent breaks will help cool the body.

The OSHA-NIOSH Heat Safety Tool is an app that can assist in planning outdoor work activities based on how hot it feels throughout the day. The free app, available through either the App Store or Google

Play, features a real-time heat index and hourly forecasts.

Other features of the app include:

- Visual indicator of the user’s current heat index and associated risk levels specific to the user’s geographical location
- Precautionary recommendations specific to heat index-associated risk levels

- An interactive, hourly forecast of heat index values, risk level, and recommendations for planning outdoor work activities
- Editable location, temperature and humidity controls for calculation of variable conditions
- Signs and symptoms and first aid information for heat-related illnesses