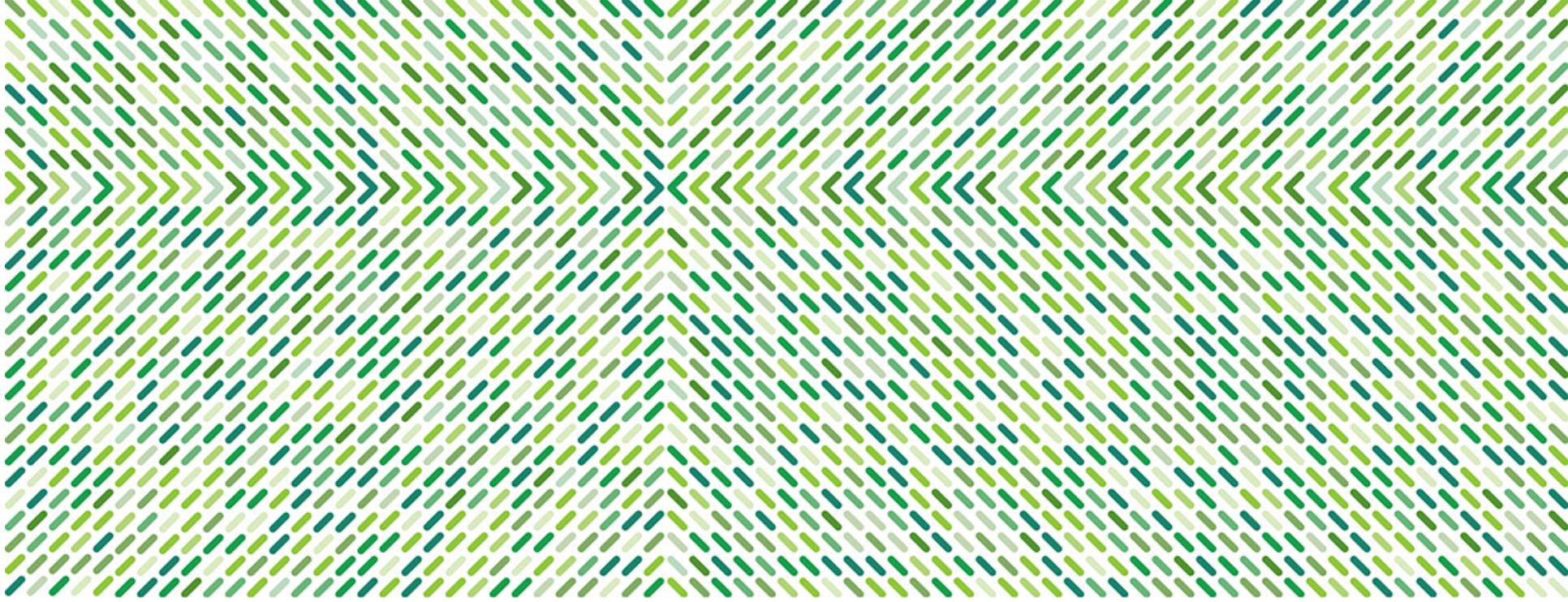




NATIONAL
ASSOCIATION OF
**LANDSCAPE
PROFESSIONALS**

Understanding Heat Stress Hazards Among Landscape & Lawn Care Workers



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Don't Allow Hot and Humid Weather to Take Its Toll on Your Employees!

Remember: "Water-Rest-Shade"

This presentation will deliver important information on:

- Introduction to occupational heat exposure
- Heat illness and heat stress defined
- Recognizing heat stress symptoms
- Tools for predicting the onset of heat stress conditions
- Weather conditions causing heat stress
- Other factors contributing to the onset of heat stress
- Preventing heat stress among your workers

INTRODUCTION

Many workers in both indoor and outdoor environments are exposed to heat while working. Work involving high air temperatures, radiant heat, high humidity, direct contact with hot surfaces or objects, and strenuous physical activity can result in heat-related illnesses.

All of the above factors (and other circumstances) are potential exposure factors for landscape workers!

During this presentation we will carefully examine these contributors to heat stress and suggest methods for preventing or limiting their impact on the safety and health of workers.

Defining terms related to heat illness and heat stress

THERMOREGULATION

Thermoregulation is the ability of the human body to adjust to excessively cold, or excessively hot environmental conditions.

Further, when exposed to hot working conditions, the body must be able to get rid of excess heat to maintain a stable internal temperature, in a normal range around 98.6 degrees F.. If the body can not “regulate” normally, the body core temperature will rise to dangerous levels and result in progressively more severe heat-related illnesses.

ACCLIMATIZATION

This term refers to the gradual ability of the human body to adapt to increasingly more strenuous physical activity that takes place in a work environment with higher temperatures and humidity.

Essentially, new hires in the landscape industry may be asked to do outdoor work for which their bodies are not prepared (or acclimatized). New hires represent a reported 70 percent of heat-related fatalities during their first week.

Acclimatization may take a well-planned week or two of increasingly more strenuous work each day. Acclimatization can be undone in 3-5 days if no strenuous work is experienced.

Heat Illness and Heat Stress

A sequence of heat-related illnesses from this list is typically less serious to those that are “life-threatening” and would include:

- Heat Fatigue
- Heat Rashes
- Heat Collapse (aka “fainting”)
- Heat Cramps
- Heat Exhaustion
- Heat Stroke

Here is a brief description of symptoms for each illness above in order of severity.

Heat Fatigue

Under most work conditions, new or replacement workers who are not used to warm work environments (have not been acclimatized) are prone to this ailment.

Symptoms include impaired sensorimotor skills, and impaired mental or vigilant decision-making. Since many landscape workers may be using powerful machinery, what are the potential risks when heat fatigue sets in? Could an operator make an unsafe choice of taking a short cut, or use the machine carelessly to get the job done quicker?

Ensure that your employees are well rested and acclimatized to the working conditions they will be exposed to each day.

Heat Rash

Heat rash or prickly heat, is a very common problem in hot work environments.

Body areas exposed to restrictive clothing often become covered with red papules that cause a prickly sensation.

Profuse sweating that keeps the skin continually wet under warm conditions can result in a skin infection.

Heat rash usually cures itself when the victim returns to a cooler, drier environment.

Heat Collapse (aka “fainting”)

Heat collapse is usually the result of blood pooling in the body’s extremities and not carrying enough oxygen to the brain. This can result in a lack of consciousness very quickly and unexpectedly.

Workers who are not used to, or prepared for, strenuous work during warm and humid weather are most prone to this level of heat stress.

Heat Cramps

Heat cramps are attributed to an electrolyte imbalance related to sweating during hard physical work. Health practitioners suggest that the symptoms result from both too much, or too little salt.

The water lost by excess sweating while working must be replenished in order to minimize heat cramp conditions.

Please don't use "thirst" as a guide to water replenishment! Water should be taken every 15-20 minutes while doing physically demanding landscape work under hot weather conditions.

Heat Exhaustion

Don't be confused about the symptoms of heat exhaustion. It could mimic as an upset stomach, but during hot weather work, headaches, nausea, vertigo, muscle weakness, thirst, and giddiness may indicate the onset of this serious ailment.

Do not ignore the serious implications related to exhaustion and fainting while operating machinery and as a precursor to a heat stroke.

Coming to work tired to begin a new work day may increase the risk for heat exhaustion.

Heat Stroke

Heat stroke is a **MEDICAL EMERGENCY** that needs immediate treatment. It occurs when the body's temperature regulation system is unable to maintain a normal body temperature at or near 98.6 degrees F.

Symptoms include confusion, irrational behavior, loss of consciousness, convulsions, lack of sweating, hot-dry skin, and an abnormally high body temperature – at or above 105.8 degrees F.

Some medications critically increase the onset of heat stroke. Workers should carefully check medicinal labels for warnings.

Organs will shut down making recovery very difficult.

Heat Stroke

NIOSH FACE Report review from Michigan (2002)

Type of Work – Residential lawn care, including mowing, edging, trimming and back-pack debris blowing.

Work Crew – Two-member residential crew, victim was laborer

Weather Conditions – Maximum temp during this workday was 81 degrees F. during the afternoon.

Symptoms – Reported illness to crew supervisor at 3 pm as being light-headed and short-of-breath. Refused assistance at that time. Collapsed at 5 pm and was taken to emergency care facility where rectal temperature was determined to be 107.6 degrees F.

Death of worker attributed to organ shutdown due to extremely high body core temperature and multi-drug intoxication.

Methods for treating heat stress conditions

Call for EMS assistance immediately and remove the victim from direct sunlight to a cooler and shady location.

Don't be fooled by an apparent quick recovery! Heat exhaustion is just one step removed from a potentially fatal heat stroke.



Defining NON-EXERTIONAL HEAT STROKE - NEHS

This type of heat stroke resulting from abnormally high body temperature (>105.1 degrees F.) is caused by excessive environmental heat and impaired bodily heat loss.

This hot environment illness typically affects: the elderly; individuals who have consumed alcohol or have taken certain medications or stimulants; and victims exposed to very hot conditions in an environment with no cooling or ventilation.

Defining EXERTIONAL HEAT STROKE - EHS

This type of heat stroke is more common among outdoor workers exposed to strenuous physical activity in a hot, humid environment.

It is not limited to just older individuals and can severely impact your young and healthy workers, even those who have not taken any medications.

New, replacement, and other workers who have not been acclimatized to hot work environments are especially at risk.

- Comparing hypothermia verses hyperthermia
- Normal human body temperature is +/-98.6 degrees F.
- Notice that the difference between too cold and too hot is only 6.7 degrees F.
- WARNING: NIOSH FACE Report on a heat-related workplace death of a landscape worker documented an emergency room rectal temperature reading of 107.6 degrees F. (See previous slide)

HYPERTHERMIA

Elevated body core temp
▶ 101.7 F

HYPOTHERMIA

Reduced body core temp
◀ 95.0 F



OSHA recommendations take into account the following occupational heat exposure factors:

- Rising temperature
- High humidity
- Intense sun exposure
- Lack of air movement
- Machines radiating heat
- Strenuous work
- Requirements for PPE

OSHA General Duty Clause – Employers are required to provide their workers with a place of employment that “is free from recognizable hazards that are causing or likely to cause death or serious harm to employees.”

OSHA Personal Protective Equipment (PPE) Standard 29 CFR 1910.132(d) for determining the appropriate PPE (based on occupational heat exposure) to be used for protecting employees from hazards identified during worksite assessments.

Be aware that 28 states have a “state OSHA plan” that may include more specific occupational heat exposure regulations.

California is one of the 28 states with a “state OSHA plan” that may include more specific occupational heat exposure regulations.

In 2015 it was necessary for Cal/OSHA to clarify the wording and requirements on heat illness prevention. Here are just two of the 2015 revisions.

1. Provision for water – Water must be fresh, pure, suitably cool and provided “free of charge”.
2. Access to shade – Employees taking a preventative cool-down rest “shall be monitored and asked if he or she is experiencing symptoms of heat illness”. Cool down rest areas must be readily accessible.



EPA's Worker Protection Standard

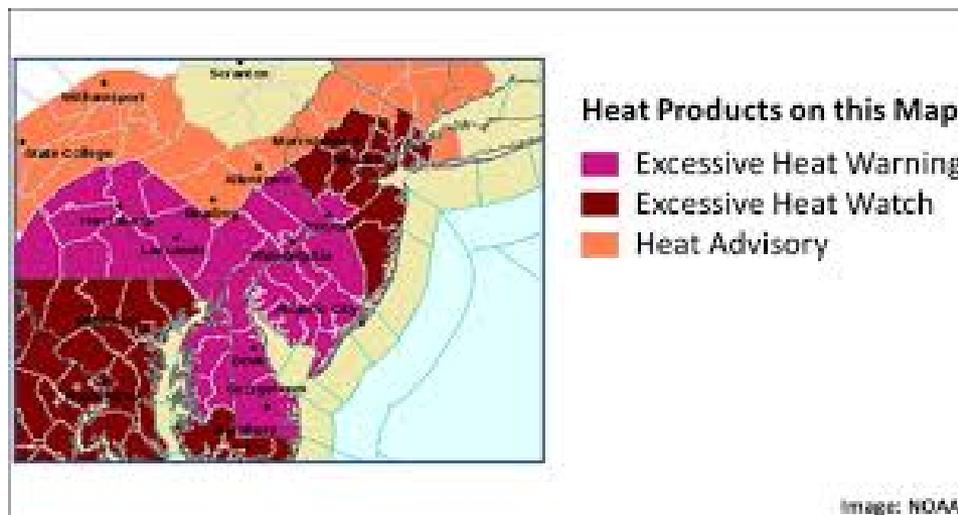
The EPA Worker Protection Standard was promulgated to protect workers from exposure to agricultural pesticides. The revised EPA WPS published in 1992 included provisions for heat stress management. This was necessitated because of the impermeability of PPE during application work and its required use during re-entry into treated areas before the REI's had expired.

Find additional guidance at www.epa.gov/

Tools for predicting heat stress conditions

NOAA weather maps can assist employers in preparing for hot weather work. Some extremely strenuous work may need to be delayed due to dangerously high temperature extremes and excessive relative humidity.

NOAA – National Oceanic and Atmospheric Admin.



Other contributors to occupational heat stress:

- Age
- Medication
- Alcohol/Stimulants

AGE

The factors that contribute to an increased risk of heat stress among older workers are:

- Older workers are not able to adjust as quickly to sudden increases in temperatures.
- Older workers are more likely to have medical conditions that inhibit the body's normal ability to respond to hot and humid work environments
- Older workers are more likely to be taking prescription drugs that negatively impact the body's core temperature regulation, including the cooling effects of perspiration with evaporation.

MEDICATION

Medications including prescription and over-the-counter drugs like antihistamines for easing the symptoms of a runny nose from allergies, will also inhibit normal sweating. This impacts the body's ability to cool itself.

Beta blocker meds for high blood pressure are also problematic. Heat stress normally increases heart rate or the pumping of blood in vessels under the skin where convection can rid the body of some heat.

Beta blocker heat stress symptoms are difficult to assess at the worksite because fellow workers will not recognize the magnitude of the medical emergency until its too late, especially when a heat stroke has reached a critical stage with an extremely high body core temperature.

ALCOHOL/STIMULANTS

Alcohol is a diuretic, meaning that it promotes dehydration in the body. This condition interferes with the body's ability to regulate its own temperature and may support the onset of heat stress. Fluids that would normally cool the body through perspiration are more often excreted as urine when the body dehydrates.

One of the heat stress stages, namely heat exhaustion, is characterized by dehydration. If left unrecognized and untreated, the more serious heat stroke stage may follow with tragic consequences, including extremely high rectal temperature readings above 105 degrees F., organ failure, and death.

Stimulants are products that increase body activity and may be taken for weight loss, depression, and other conditions. Check product labels for health warnings related to hot/humid work conditions.

Preventing and reducing the potential for heat stress among your employees

- Carefully monitor workplace temp & humidity
- Schedule physically demanding work during cooler hours
- Acclimatize your workforce in phases – 5-10 days is a typical acclimatization period
- Encourage crew supervisors to observe and interact with each crew member on a regular basis – more so on hot days!
- Provide shade, rest breaks, and liquids!
- Halt work under extreme temperatures
- Train your workers on recognizing heat stress – a buddy system is critical!

Things to Remember

- Thirst is not a good indicator of the need for drinking water on the worksite.
- Occupational heat stress has side effects that may not be apparent to the worker or supervisor.
- Acclimatization takes 5-10 days to achieve for most workers and can be undone in 4-5 days.
- It doesn't take extremely high air temperatures for the onset of heat stress – medication can be a factor.
- Even the mildest types of heat stress can seriously affect the ability of workers to operate machinery.
- Firms where air temperatures can be extreme need a “hot weather work” training program.

OSHA's Heat Illness Prevention campaign, launched in 2011, educates employers and workers on the dangers of working in the heat. Through training sessions, outreach events, informational sessions, publications, social media messaging and media appearances, millions of workers and employers have learned how to protect workers from heat. Our safety message comes down to three key words: **Water. Rest. Shade.**

Dangers of Working in the Heat

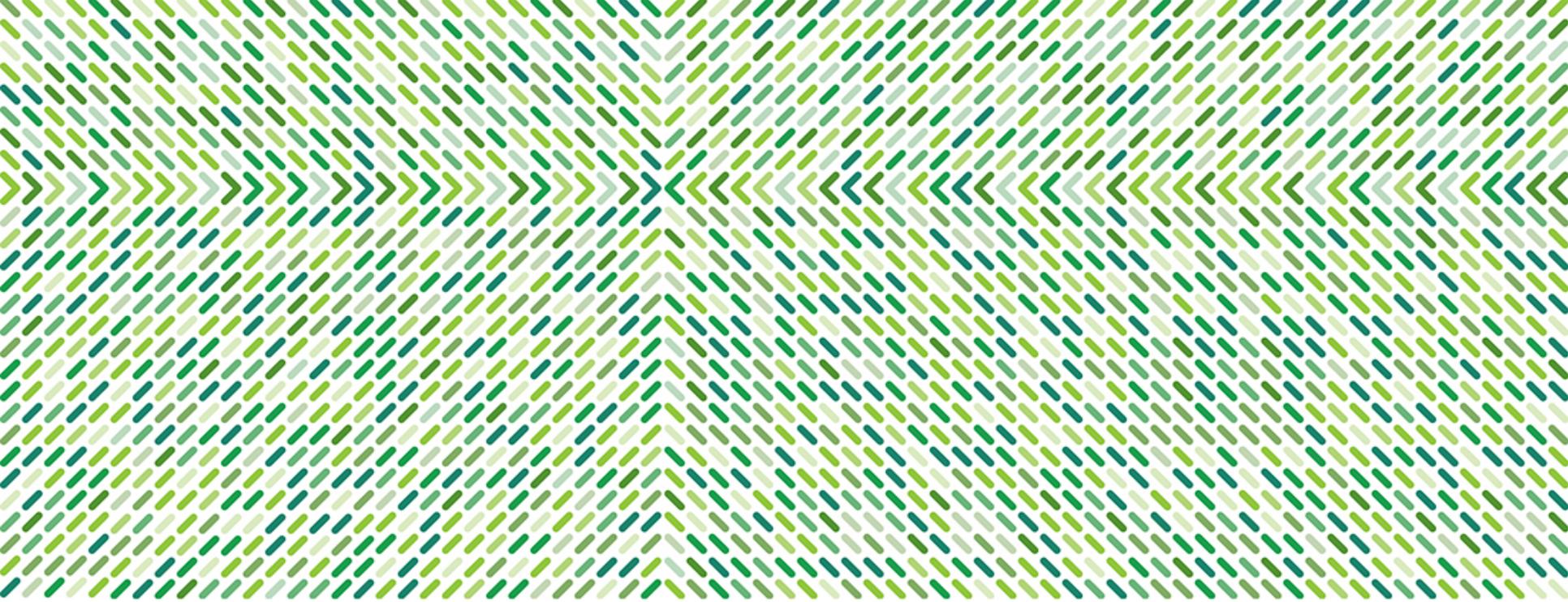
Every year, dozens of workers die and thousands more become ill while working in extreme heat or humid conditions. More than 40 percent of heat-related worker deaths occur in the construction industry, but workers in every field are susceptible. There are a range of heat illnesses and they can affect anyone, regardless of age or physical condition.

Employer Responsibility to Protect Workers

Under OSHA law, employers are responsible for providing workplaces free of known safety hazards. This includes protecting workers from extreme heat. An employer with workers exposed to high temperatures should establish a complete heat illness prevention program.

- Provide workers with water, rest and shade.
- Allow new or returning workers to gradually increase workloads and take more frequent breaks as they acclimatize, or build a tolerance for working in the heat.
- Plan for emergencies and train workers on prevention.
- Monitor workers for signs of illness.

[OSHA's Occupational Exposure to Heat page](#) explains what employers can do to keep workers safe and what workers need to know - including factors for heat illness, adapting to working in indoor and outdoor heat, protecting workers, recognizing symptoms, and first aid training. The page also includes resources for specific industries and OSHA workplace standards. Also look for heat illness educational and training materials on our OSHA website at www.osha.gov.



www.landscapeprofessionals.org