Health and Safety

Preventing Heat Stress

It's that time of the year when nursery workers are exposed to long hours in the sun. and are therefore at risk to a number of heat-related illnesses **(Table 5).** Heat stress is a function of environmental conditions and personal condition. There are four environmental factors that contribute to heat stress: air temperature, humidity, wind velocity, and radiant heat. People vary in susceptibility to heat with age, gender, weight. physical condition, medical history, and degree of acclimation.

Controlling heat stress is the common responsibility of the nursery manager and the workers. A comprehensive heat safety program should consist of eight steps:

1. **Assign responsibility—Make** sure that someone takes the lead in the program. Ideally, one field worker should be appointed a safety coordinator and receive special training, but everyone should he taught to look out for each other.

2. **Hold seasonal** training—All new workers, and especially supervisors, should be trained in the recognition, prevention, and treatment of heat-related problems. Refresher courses should be given at the beginning of each season and work crews should be reminded with periodic tail-gate sessions and posters.

3. **Acclimatize workers—** The human body need time to adapt to working in the sun and heat, and this is particularly important for new hires. Acclimatization is a physiological process where the body adapts to the type of work and ambient heat levels, improving the circulation system and salt balance. It usually takes about two weeks, although individuals acclimatize at different rates. Everyone, regardless of their age or physical condition needs time to acclimate to heat, so don't assume that someone in good physical shape will naturally he more heat tolerant.

4. **Adjust for weather conditions and type of** work—Work assignments should take into account weather, workload. the physical condition of the worker, and if special protective clothing will be worn. Watch weather forecasts and monitor conditions at the work site. and then adjust the job accordingly. Assign tasks based on ability, acclimatization, and general health. Adjust work times to cooler hours and postpone strenuous jobs during unseasonably hot weather. Schedule or modify pesticide application methods to account for high temperatures. Schedule frequent water and rest breaks and provide shade.

5. **Establish a drinking water program—** Dehydration is the primary cause of heat-related illnesses, so replacing water loss through sweating is the single most important factor of a heat safety program. Water is physiologically important for two reasons. We all know that sweating is an evaporative process which cools the skin, but dehydration also strains the circulation system. The human body contains about 5 quarts (4.7 1) of blood (mostly water), which helps cool the body by conducting heat produced by the muscles to the skin surface. The amount of water that is needed to prevent dehydration varies between individuals, and is affected by temperature, humidity, and the type of work. An average person requires 6 to 10 quarts of water on a hot summer day. Thirst is not a good indication of when or how much to drink because the sensation of thirst always lags behind the physiological demand for water. Workers should he trained to drink some extra water before starting the job and then drink "by the clock"—at least one cup of water every 30 minutes under average conditions **(Figure 14).** Water temperature should be cool but not cold, and plain water is generally preferable to other types of liquid, including sports drinks.

6. **Make proper clothing a condition of employment—**Encourage workers to wear light-colored. loose weave cotton garments and especially to wear hats or visors. Provide special cooling clothing if necessary. Special cooling vests and sweat bands are now available and are particularly effective when chemical resistant suits must be worn. The Cool Clothes™ company manufactures a line of clothing that contains water-absorbing copolymer gels that help keep you cool through evaporation **(Figure 15).** If the garments are soaked in water for 10 to 30 minutes, they will provide cooling relief for hours or even days (For more information. contact the company at Tel: 757/496-9050; Fax: 757/496-9061).

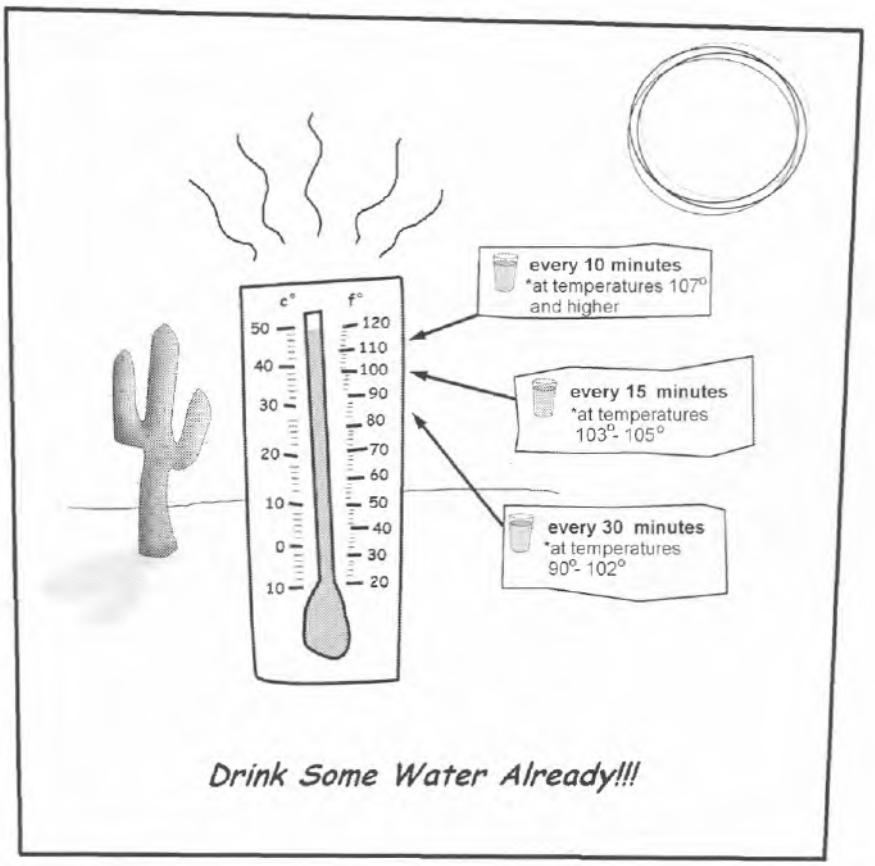

Figure 14. Humans cannot be acclimatized to need less water when working under hot conditions, and the average worker requires 6 to 10 quarts of water on a hot summer day. The rate of water consumption should increase with temperature.

7. **Give first aid quickly—All** workers should be trained to recognize the first symptoms of heat stress in themselves and their fellow employees **(Table 5).** Under hazardous conditions, nobody should work alone and employees should utilize a buddy system to look out for each other. Supervisors or safety officers must take quick action whenever symptoms are noticed and document all incidents, however minor, in writing. Workers must understand that asking for aid is encouraged and that they will not be penalized.

Safety Posters—The US Environmental Protection Agency has developed an informative poster called "Controlling Heat Stress Made Simple" that provides basic instructions for prevention as well as signs, symptoms, and treatments for heat-related illnesses. They can be purchased through the Government Printing Office for only $1.25. Contact them at Tel: 202/512-1800 or Fax: 202/512-2250, and request document #055-000-00544-3.

The "Horticultural Health—Heat Stress" poster contains much of the same information but is printed on tear-resistant, water-repellent Tyvek paper that will hold-up well around the nursery. They are available for $9.95 + 4.95 (S&H) through Blue Crab Press (Tel: 757/496-9050; Fax: 757/496-9061)

Figure 15. New types of clothing, such as these head bands, are now available to help keep you cool when working under hot conditions (courtesy of Cool Clothes, Inc.)

Source:

Appleton, B.L. 1996. Dealing with heat stress in the nursery industry. Nursery Management & Production 12(7):59-60, 63-65.

OSHA. 1993. A guide to heat stress in agriculture. Pub. No. EPA-750-b-92-001. Washington, DC: U.S. Environmental Protection Agency. 44 p.

Table 5. Types of heat-related illnesses, their diagnosis and treatment.

Type of Illness	Signs and Symptoms	Cause and Problem	Treatment
Mild Heat Stress	+Dizziness, fatigue, or irritability with decreased concentration and impaired judgement	Reduced blood flow to the brain	* Loosen clothing * Rest in shade * Drink water
Heat Rash ("prickly heat")	+Tiny, blister-like red spots on the skin with prickling or itching. +Common on clothed areas.	Plugged sweat glands become inflamed	" Wash skin and apply lotion or corn starch A See physician if rash persists.
Heat Cramps	+Heavy sweating; painful spasms of legs, arms, or abdominal muscles; can occur after strenuous work	Loss of electrolytes during heavy perspiration	* Loosen clothing * Drink lightly salted liquids or sports drinks * Massage affected muscles
Heat Exhaustion	+Profuse sweating, fatigue, headache, dizziness, nausea, chills, fainting +Pale, cool skin; excessive thirst, dry mouth; dark yellow urine. +Fast pulse, with body temperature from 99.5 to 101.3 °F (38 to 39 °C)	Dehydration, especially without proper acclimatization. Reduced blood flow to brain. *May lead to heat stroke*	Move patient to shade and make them recline and rest * Loosen and moisten clothing, and fan to cool body * Encourage patient to drink water, *but do not give salt* *A If patient becomes unconscious, treat for heat stroke*
Heat Stroke ** Life-threatening Emergency "*	+ Often develops suddenly. +Headache, dizziness, confusion, incoherent speech, irrational or aggressive behavior. +Sweating may decrease or even stop. +Body temperature of over 104 °F (40 "C)	Sustained exertion in heat, especially without proper acclimatization. Temperature-regulation system of body fails. Risk of permanent damage to internal organs	" Move patient to shade and wrap body with wet cloth and fan to cool. * Treat for shock by elevating legs * Transport immediately to medical treatment facility * Encourage patient to drink water, *but do not give salt*

Helping Hands

Nursery work means hand labor. The hands of you or your crew are in frequent contact with soil, growing media, fertilizers and other chemicals that suck the moisture right out the skin. Long hours in the sun and wind accelerate the problem as does the need to frequently wash your hands after exposure to fertilizers and pesticides or before breaks and lunch. Our skin contains natural oils that keep it moist and pliable but this natural protection is quickly lost during routine nursery tasks. The result is a condition called eczema with symptoms of inflamed skin which itches and often develops small spits and cracks, especially around the nails. These cracks only get worse with time and can become very painful and annoying; in extreme cases, your hands can become infected.

Many people think that rough, dry hands are an unavoidable hazard of working in a nursery but that's not true. A few simple precautions and treatments can protect the skin on your hands and make nursery work even more enjoyable:

* ***Wear gloves—the*** best treatment is prevention, so get in the habit of wearing gloves whenever you do hand labor. Yeah, I know—you don't like wearing gloves because you lose dexterity and the "feel" that makes many tasks quicker and easier. Good habits must be learned and so, as the commercial goes —"just do it". There are several types of gloves available so select the most appropriate kind. Cotton gloves are cheap and good for general purpose work, and special gloves without fingertips aid dexterity for sensitive tasks. Many workers prefer leather gloves when operating equipment or during repetitive use of hand tools because they offer greater protection and last longer. And, of course, use the recommended rubber or plastic gloves whenever handling chemicals, especially pesticides.

* *Use moisturizers—You* need to rehydrate your skin frequently when working in the nursery, especially after you wash them. Hand creams or ointments are better than lighter weight lotions and oils. Moisturizers containing petrolatum, glycerin, or lanolin are best and some brands are specially formulated with humectants that give maximum protection against drying. Be sure to work moisturizers into the area around the nails. If your hands are already badly damaged, soak your hands in warm water and apply petroleum jelly or bag balm and cover with light cotton gloves before going to bed.

Figure 16. Dry skin splits and small cuts heal quickly and do not become infected when fused together with a small amount of epoxy (courtesy of NM Pro Magazine and Bonnie Appleton).

* *Repair skin cracks—Those* annoying small splits that develop around your nails or any small cut can be easily and quickly healed by fusing them together with epoxy glue **(Figure 16).** Clean the area first and remove any rough areas with an emory board. Apply a small amount of epoxy and hold the two sides together for a few minutes until they are joined. A little final buffing with the emory board and even the most stubborn skin cracks will be healed within a few days.

Source:

Selden. S.; Appleton, B. 1997. Hand and foot care for nurserymen. Nursery Management and Protection 13(3):36-38, 40-41.