

# Cold-Related Conditions and Agriculture eXtension

(<http://articles.extension.org/pages/66813/cold-related-conditions-and-agriculture> )

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Winter Scene

(Source: Wyoming AgrAbility)

Farmers and ranchers complete tasks in all types of weather conditions. Extreme weather conditions put agricultural producers at risk for heat-related and cold-related illnesses and injuries. (Click [here](#) to view an article about heat-related illnesses)

Individuals working in extremely cold or wet weather can experience such occupational health conditions as **hypothermia**, **frostbite**, **trench foot**, and **chilblains**.

The four environmental factors that cause cold-related illnesses are

- low temperature,
- strong and/or cool winds,
- dampness, and
- cold water.

The most dangerous factor in winter weather is **wind chill**, a measure of the rate at which skin exposed to the combined effects of wind and cold loses heat. When wind increases, the body loses heat at a faster rate, which causes body temperature to decrease.

Individuals generate body heat from food and through muscular activity and lose heat through convection, conduction, radiation, and sweating. In general, the processes of generating and losing body heat are balanced, resulting in a constant body temperature. When a person's body temperature drops below the normal temperature of 98.6°F, he or she may experience blood vessel constriction and decreased peripheral blood flow, putting the person at risk for adverse cold-related conditions.

## **Cold-Related Conditions**

### **Hypothermia**

Hypothermia occurs when a person's body is unable to produce heat and has used all its stored energy or is losing body heat faster than it can be produced. As a result, a person's body temperature decreases. When a person's body temperature drops below 95°F degrees, the heart, nervous system, and other organs can be adversely affected. The most common causes of hypothermia are exposure to cold weather and immersion in cold water.

### **Early Symptoms**

- Shivering
- Decreased energy
- Fatigue
- Loss of coordination

### **Symptoms after Prolonged Exposure to Cold**

- Dilated pupils
- Decreased pulse

- Shallow breathing
- Loss of consciousness

### **First Aid Response**

- Call 911 or emergency medical personnel.
- Find a warm room or shelter and remove any wet clothing.
- Drink a warm (nonalcoholic or caffeine-free) beverage if one is available.
- Stay dry and warm by wrapping up in a blanket.
- If you are assisting a person with hypothermia, and he or she does not have a pulse, begin **cardio-pulmonary resuscitation (CPR)**. (Click [here](#) to be directed to the article "Basic CPR.")

### **Frostbite**

Frostbite occurs when skin tissue freezes and loses water, leading to the potential for cell damage. Skin can freeze at temperatures of 30°F and below, and wind chill can also cause frostbite. Fingers, toes, cheeks, nose, and ears are the areas of the body most typically affected by frostbite. Frostbitten skin may look white or grayish yellow and may feel cold, hard, and possibly waxy to the touch.

### **Symptoms**

- Numbness
- Aching
- Tingling
- Stinging

### **First Aid Response**

- Find a warm room or shelter.
- Avoid walking if your feet or toes are frostbitten.
- Soak affected areas in warm (not hot) water.
- Avoid rubbing the affected area because rubbing could cause tissue damage.
- Wrap affected area in a soft cloth.
- **Do not** use a heating pad, fireplace, or radiator for warming.
- **Do not** warm the area if there is a risk of refreezing.

### **Trench Foot**

Trench foot occurs when a person's feet have prolonged exposure to cold (60°F or less) and wet conditions. This condition is similar to frostbite but is typically less severe.

### **Symptoms**

- Reddening of the skin
- Numbness
- Leg cramps
- Swelling
- Tingling pain
- Blisters or ulcers
- Bleeding under the skin
- Gangrene

### **First Aid Response**

- Remove shoes or boots and wet socks.
- Dry the feet.
- Avoid walking to reduce the risk of damage to foot tissue.

### **Chilblains**

Chilblains are painful inflammations in small blood vessels in the skin that result from exposure to cold temperatures. The areas most commonly subject to chilblains include the toes, fingers, ears, and nose.

### **Symptoms**

- Redness
- Blistering
- Itching
- Inflammation
- Ulceration (in severe cases)

### **First Aid Response**

- Avoid scratching the affected skin.
- Slowly warm the skin.
- Use corticosteroid creams to relieve itching and swelling.
- Keep blisters and ulcers clean and covered.

## **Preventing Cold-Related Conditions**

There are several actions you can take to maintain a normal body temperature in cold and/or wet weather.

### **Clothing**

- Wear a minimum of three layers of clothing: an outer layer that breaks the wind, a middle layer that retains insulation, and an inner layer that allows for ventilation.
- Have a change of clothes readily available in case your garments become wet.
- Always protect your head and face because you can lose up to 40% of your body heat through your head.
- Protect your feet from cold and dampness by wearing layered socks inside comfortable, insulated footwear.
- Protect your hands with insulated gloves (dexterity can be affected at temperatures below 59°F).

### **Environment**

- Use on-site sources of heat, such as air jets and radiant heaters, to provide warmth.
- Make sure that a heated shelter or vehicle is available for anyone who has experienced prolonged exposure to wind chill temperatures below 20°F.
- Reduce drafty or windy areas within buildings to shield work areas.
- If the temperature drops below 30°F, use thermal insulating material on the handles of your equipment.
- Avoid sitting or kneeling on cold, unprotected surfaces.

### **Personal Safety**

- If you suffer from a medical condition such as diabetes, atherosclerosis, spinal cord injury, arthritis, and so on, you may need to take special precautions when working in cold environments because you could be especially susceptible to cold-related illness and injury.
- If you take prescription medication (heart medication, sedatives, and so on), check with your physician to determine whether you need to take any special precautions when working in the cold.
- Never use alcohol or drugs when working in a cold environment because such substances increase heat loss and can impair judgment.
- Know the signs and symptoms of cold-induced conditions and how to respond appropriately with first aid.
- Seek warm shelter if you experience symptoms (heavy shivering, severe fatigue, drowsiness, and so on) of cold-induced illnesses.
- Avoid tasks that may cause excessive sweating.
- Maintain energy and hydration by drinking warm caffeine-free, nonalcoholic beverages.
- Stay in good physical condition.

## **Farm and Ranch Managers' Responsibilities**

If you are a farm or ranch manager, take the following precautions to keep your workers safe in cold and/or wet weather:

- Allow workers to complete tasks at a comfortable pace and take extra breaks if needed.
- In cold environments, be sure that workers always work in teams of two or more.
- If a job needs to be completed outside, schedule the job for the warmest part of the day.
- When possible, move outdoor jobs to an enclosed area.
- Discourage workers from sitting or standing for prolonged periods during cold weather.
- Allow workers to acclimate themselves to the cold before they begin a task.

## **Resources**

For more information about injuries in cold weather, click [here](#) to watch a webinar by the National AgrAbility Project titled Cold Work Injuries in Agriculture - Strategies for Prevention and Rehabilitation.

*Linda M. Fetzer, Pennsylvania State University – [lmf8@psu.edu](mailto:lmf8@psu.edu)*

*Reviewers:*

*Karen Funkenbusch, University of Missouri – [FunkenbuschK@missouri.edu](mailto:FunkenbuschK@missouri.edu)*

*Dennis J. Murphy, Pennsylvania State University – [djm13@psu.edu](mailto:djm13@psu.edu)*

*Ron Odell, Cactus Feeders – [ron.odell@cactusfeeders.com](mailto:ron.odell@cactusfeeders.com)*

*Aaron M. Yoder, University of Nebraska Medical Center - [aaron.yoder@unmc.edu](mailto:aaron.yoder@unmc.edu)*

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