

# Winter Storms

## Winter Storms

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## Winter Storms

Winter storms can strike any area. Even areas that normally experience mild winters can be hit with a major snowstorm or extreme cold. The results can be isolation from power outages, blocked roads and cars trying to maneuver ice-covered highways. Everyone needs to be prepared to protect themselves from the hazards of winter weather-blizzards, heavy snow, freezing rain and sleet.

## Preparing for Winter Storms

1. Being familiar with terminology used by the Weather Service will help you know what to expect when weather warnings are issued. The following terms are used frequently in winter weather releases:

**Freezing rain** occurs when temperatures are below 32°F and rain freezes on impact. This causes an ice coating on all exposed surfaces. If the coating is heavy, falling trees or wires can be additional hazards.

**Freezing rain or drizzle** is called an ice storm when a substantial glaze layer accumulates. In some parts of the country, ice storms are called "silver thaws" or "silver frosts."

**Sleet** is frozen rain drops (ice pellets) which bounce on surface impact. Sleet does not stick to objects, but sufficient accumulation can cause dangerous driving conditions.

**Travelers' advisory** means that falling snow and/or drifting snow, strong winds, freezing rain or drizzle will make driving hazardous.

**Heavy snow warnings** are issued when 4 or more inches are expected during a 12-hour period, or when 6 inches or more are expected during a 24-hour period.

**Blowing and drifting snow** result from strong winds. Blowing, falling snow or loose snow on the ground can produce sizeable drifts. Blizzard warnings are issued when wind speeds of 35 miles per hour or more are expected with blowing or drifting snow.

**Snow squalls** are brief, intense snowfalls accompanied by gusty surface winds.

**Wind chill factor** is the combined effect of wind and cold. A very strong wind combined with a temperature below freezing can have the same chilling effect as a temperature almost 50 degrees lower with no wind. Anyone who is outdoors and exposed to low temperatures and strong winds will be more easily exhausted and more subject to frostbite or death.

Temp.	Wind 15 mph	30 mph	40 mph
30°F	11°F	- 2°F	-4°F
20°F	- 5°F	- 18°F	- 22°F
10°F	- 18°F	- 33°F	- 36°F
0°F	- 33°F	- 49°F	- 54°F
-10°F	- 45°F	- 63°F	- 69°F
-20°F	- 60°F	- 78°F	- 87°F
-30°F	- 70°F	- 94°F	-101°F
-40°F	- 85°F	-109°F	-116°F

2. Pay attention to weather forecasts and other winter weather releases on radio and television.

3. Check battery powered equipment, emergency cooking facilities and flashlights so you won't be without heat or light during a storm.

4. Check your supply of heating fuel. Fuel carriers may not be able to deliver during heavy snow.
5. Stock extra food. Include food that needs no cooking in case of power failure.
6. If power is out, keep your refrigerator and freezer doors closed as much as possible.
7. Prevent fires by not overheating your stove, heater or furnace. Don't leave fireplaces unattended.
8. Stay indoors during cold snaps and storms unless you are in top physical condition. If you must go out, don't overexert.

Be particularly careful when shoveling snow.

Heart attack is a common cause of death during and after winter storms. Remember that cold winds and temperatures put extra stress on your body even if you are in good condition.

9. Wear several layers of loose-fitting, lightweight, warm clothing. Layers of clothing trap warm air close to your body.

You can remove clothing to prevent perspiring and subsequent chill. Outer clothes should be tightly woven, water repellent and hooded if possible.

Cover your mouth to protect your lungs from extreme cold.

10. Get your car winterized before the cold season.

Use snow tires or chains.

Keep the fuel tank filled to prevent water from getting into the fuel and causing the engine to stall.

11. If you must travel when bad weather is forecast, be sure someone knows where you are going and the time you expect to arrive. Travel with someone else if at all possible.

12. Blizzards may require long periods of isolation. If you need outside help during this time, you should know the following emergency distress signals to signal aircraft:

Need doctor . . . . .I

Need medical supplies . . . . . II

Need food and water . . . . .F

Need fuel . . . . .L

International distress signal . . . . .SOS

Make these signals on the ground where they will be clearly visible from the air. The letters should be at least 10 feet tall.

Use black cloth or plastic, hay, boards or other material readily visible on the white snow. If no materials are available, tramp the letters into the snow, deep enough to create as much shadow as possible.

## Special Considerations for Travelers

When traveling any distance by car during the winter, observe these safety precautions:

1. Before you leave, have your car checked. A thorough winterizing check should include:

Ignition system Battery Lights Snow tires installed Cooling system  
Fuel system Exhaust system Heater Brakes Wiper blades Defroster  
Tire chains and tow chains Antifreeze Winter-grade oil

2. Select alternate routes before you leave, in case your preferred route isn't passable.
3. Listen to the radio as you travel and heed latest weather information.
4. Seek shelter immediately if the storm seems severe.
5. Try not to travel alone during a storm. Two or three people are better than one because they can help each other. Travel with another car if possible.
6. Make sure someone knows where you are going, when you leave, the time you expect to arrive and your expected route.
7. Always fill your gas tank before entering open country, even for short distances. You will be less likely to be stranded from running out of gas. In case you are stranded by the storm, you will have enough fuel to run the motor and heat the car.
8. Drive defensively.
9. Carry a winter storm car kit. This should include:

Blankets or sleeping bags to keep you warm, or a box of newspaper to use as insulation Matches and candles for light Empty coffee can with plastic cover to use as a toilet Facial tissues and paper towels, Extra clothing, especially caps, mittens and overshoes, High-calorie nonperishable food, Compass and road maps, Knife, First aid kit, Shovel, Sack of sand, Flashlight or signal light with extra batteries, Windshield scraper, Booster cables, Two tow chains, Fire extinguisher, Catalytic heater, Axe, Plastic scraper, Transistor radio with extra battery, Tools - pliers, screwdriver, adjustable wrench, Flares

## Winterizing Mobile Homes

1. Inspect the roof for leaks and cracks. Water can seep through to damage ceilings, interior panels or furnishings.

When making inspections or repairs, do not walk on the roof unless it is absolutely necessary.

Most repair work can be done from an extension ladder. Be careful not to lean to the side of the ladder when making repairs. Instead, move the ladder to the work area.

2. Check locked or lapped roof seams for loose screws, spreading, parting or buckling. Add new screws if necessary, and cover all seams with roof coating or asphalt-base paint.
3. Check stacks and vents for cracks, and make sure they are free of debris.
4. Check the flashing for loose screws and separation from the roof.

Water can freeze between loose flashing and the roof, causing damage when it melts.

If necessary, attach flashing to roof area with a liberal coat of caulking and extra sheet metal screws. Then coat screws and flashing area with roof coating or paint.

5. Check to see that molding is secure where roof meets exterior walls.
6. Check total roof surface for cracks, breaks, rust or oxidation. Scrape or wire brush rusted seams and recoat entire roof.
7. Provide at least one front and rear circulation vent and two side circulation vents when installing skirting.

Keep vents free from obstructions.

Allow for frost and ground expansion. Do not apply skirting tight against the ground or tight against the bottom of the unit.

Without expansion room, frozen ground can heave the skirting against interior panels, causing wall to buckle.

8. Clean or change furnace filters as recommended by manufacturer. Collected dust can be pulled into the motor, causing it to overheat.

Some filters can be cleaned with a vacuum cleaner; some should be washed in a detergent solution; and others require replacement.

Follow manufacturer's instructions for cleaning, oiling and replacing parts.

9. During the summer months when the heater is not used, keep the fuel tank full to prevent condensation and rusting.

Use only No. 1 fuel oil or kerosene in the outside fuel tank.

No. 2 fuel oil can be used in underground tanks.

Never add gasoline or naphtha to the fuel oil.

10. If the mobile home is not positioned on concrete pads, frozen ground may cause it to heave or rise. This could make the doors stick. To correct this, turn the jack handle on the front hitch, raising the front as needed. Reverse the jack handle when the ground thaws in the spring and the unit settles again.

11. During sub-freezing temperatures give extra protection to water systems, especially if the unit is not set on a permanent sub-surface heated basement.

Skirting will help reduce some possibility of freezing damage, but will probably not eliminate the problem.

On most modern units, pipes leading from the underground pipe connection to the faucets are protected within the floor system. You will need to protect only the exposed pipes.

Use electric heat tape equipped with a thermostat. This material is available at most hardware or plumbing stores.

Tapes with built-in thermostats at the cord end are more easily accessible.

Tape the thermostat securely to the pipe where it leaves the floor of the unit. Be sure the thermostat is held firmly against the pipe for accurate temperature sensing and correct operation of the tape. Wrap the heat tape in spirals down the pipe, keeping it snug against the pipe. In general, three turns per foot of pipe (a spacing of about 4 inches between spirals) is adequate.

Apply friction tape at 12- to 16-inch intervals to hold the heat tape in place.

Wrap heat tape over the full length of the water pipe from the floor to below frost level. The heat tape should not touch itself at any point because hot spots could develop, causing failure of the tape.

Place insulation around the pipe to save electricity. Inch-thick, pre-foamed pipe insulation with a waterproof coating is recommended. Tape all joints with a waterproof tape or seal them with adhesive. Be sure the thermostat is also covered with insulation.

Plug the heat tape cord into an electrical outlet when cold weather arrives.

12. Freezing problems sometimes occur in mobile home drainage systems, especially when drain pipes below the floor are installed with very little slope. To help prevent damage from freezing:

Fix leaky faucets. When water flow in drain pipes is very slow (as from a dripping faucet) the water in the pipeline may freeze. This is especially true if faucets drip overnight.

Check toilet tanks. Water running or dripping in the toilet tank could cause sewer lines to freeze.

Install electric heating tape on the drain line. Drain pipes are less susceptible to freezing than pipes in a potable water system, so a single strand of heat tape taped to the bottom of the drain line usually will prevent freezing problems. Install insulation over the heat tape. Hold the eave in place with friction tape at 12-inch intervals. Be sure the thermostat is held securely to the pipe and is covered with insulation. Use preformed pipe insulation with a waterproof cover. Tape all joints in the insulation with waterproof tape.

## **Winterizing Residential Buildings**

When winterizing your house, check each of the following items. Repair as necessary.

### **Roof**

1. Check for broken, damaged or loose shingles; small holes; and loose nails.
2. Check flashing around all dormers, vent pipes, chimneys and any other projections where the roof covering meets an adjoining surface.

### **Gutters and downspouts**

1. Clean out leaves, dirt and debris.
2. Paint any rusty gutters.
3. Check supports.

### **Exterior**

1. Repair cracks in stucco or masonry walls.
2. Spot repair and paint any defective areas to prevent damage from freezing and thawing.

### **Windows and doors**

1. Check weather-stripping around windows, doors and between foundation and siding. Replace where needed.
2. Check metal weather-stripping for dents, bends, breaks, loss of tension or other damage that could make it less effective.
3. Repair and paint storm windows if necessary.

### **Heating system**

1. Have a qualified serviceman clean and check your furnace, replacing necessary parts. Furnace check should include:

Fan belts check for proper tension, cracks or wear.

Motors and bearings oil units equipped with oil parts.

Filters clean or install new filters. Fiberglass filters will need to be replaced because they lose their effectiveness if cleaned and re-used.

Hot and cold air registers vacuum if necessary.

Humidifier (if part of furnace) remove scale, lime deposits and corrosion. Check float valve and evaporator plate.

2. Remove air conditioner for winter storage. Cover with dust-proof cover. If air conditioner is left in the window, install a weather proof cover and seal the space around the unit.

### **Driveways and sidewalks**

1. Clean and repair cracks, fissures and joints in concrete surfaces.
2. Upgrade gravel driveways.
3. Repair cracks or fissures in asphalt drives. Seal with asphalt topcoating.

## Preparations to Reduce Heat Loss from Buildings

1. Install overhead and sidewall insulation.

Adequate insulation is one of the most important factors in reducing heat loss and will increase the comfort of your home in both summer and winter.

Under most conditions you need the equivalent of 6 inches of fiberglass thermal insulation over your top floor ceiling; 3" or 4 inches of sidewall insulation is also recommended.

2. Weatherstrip and caulk around all joints and frames of windows and doors.

3. Install storm windows and doors or insulating glass. Storm windows can result in a 10 to 20 percent reduction in heating costs. If buying storm windows is not practical (as when renting), tape clear plastic to the window frame.

4. Clean and change furnace filters regularly. Have furnaces checked and cleaned by a qualified repairman once a year. Clean and replace air filters when they become loaded with dust or lint.

5. Close window draperies at night. Regular draperies reduce heat loss slightly; insulated draperies cut down heat loss even more.

6. Seal as tightly as possible any openings which may permit cold air leakage from the attic.

Leakage is likely to occur around attic stairway doors, pulldown stairways, electric light fixtures, ceiling fans, air ducts and plumbing vents or pipes.

Air leakage from the attic not only increases heat loss but also increases the possibility of moisture condensation in the attic. Condensation can wet insulation and building materials, eventually causing structural damage and reducing the effectiveness of the insulation.

7. If your basement is heated, close off upper wall construction that is open to the attic. However, be sure to provide exterior vents into the wall cavity.

8. Repair leaking hot water faucets. Leaky faucets waste both heat and water.

9. Close fireplace dampers when they are not in use. This will keep heated air from escaping up the chimney.

## What To Do During a Home Power Failure

During severe winter storms, your home heating system could be inoperative for as long as several days. To minimize discomfort and possible health problems during this time, take the following steps:

1. Conserve body heat.
2. Put on extra clothing. If cold is severe, your bed may be the warmest place.

Extra blankets and coverings will trap body heat. This is a good way to keep children warm.

Farm families might consider taking refuge in the relative warmth of the livestock barn.

3. Find or improvise an alternative heat source. You may have alternative heating resources around your home. Possibilities include:

Fireplace

Wood, coal, gas or oil stove or space heater

Catalytic camp stove

Electric or gas oven and surface units

Portable electric heater

Gas-fired hot water heater

4. Provide fuel. Common fuel materials include:

Furnace coal

Canned heat Furnace oil

Wood chips

Campstove fuel

Alcohol

Newspapers, magazines

Charcoal lighter fluid

Kerosene, gasoline

Straw

Firewood

Corncobs

You can burn coal in a fireplace or stove if you make a grate to hold it, allowing air to circulate underneath. "Hardware cloth" screening placed on a standard wood grate will keep coal from falling through.

Tightly rolled newspapers or magazines can be used for paper "logs." Before burning the "logs," stack them properly to allow for air circulation.

Consider burning wood, including lumber or furniture, if the situation becomes critical.

**CAUTION:** Do not store fuels in the heated area because of fire danger, especially if you have highly combustible materials such as gasoline or kerosene.

5. Select a room to be heated. To increase efficiency of available heat, close off all rooms except the one to be heated. When selecting a room or area to be heated, consider the following:

If using a vented stove or space heater, select a room with a stove or chimney flue.

Confine emergency heat to a small area.

Try to select a room on the "warm" side of the house, away from prevailing winds. Avoid rooms with large windows or uninsulated walls. Interior bathrooms probably have the lowest air leakage and heat loss. Your basement may be a warm place in cold weather because the earth acts as insulation and minimizes heat loss.

Isolate the room from the rest of the house by keeping doors closed, hanging bedding or heavy drapes over entry ways, or by erecting temporary partitions of cardboard or plywood.

Hang drapes, bedding or shower curtains over doors and windows, especially at night.

6. Provide adequate safety measures. Safety is of prime importance in a heating emergency. Your chances of freezing to death in your home are small. Fire, asphyxiation from lack of oxygen, or carbon monoxide poisoning are much greater dangers unless you take adequate safety precautions. Do not burn anything larger than candles inside your home without providing adequate ventilation to the outside.

Any type of heater (except electric) should be vented. Connect the stove pipe to a chimney flue if at all possible. (Many older homes have capped pipe thimbles in rooms once heated by stoves.) Or hook up your stove to the flue entrance of the nonfunctioning furnace pipe (after removing the pipe).

Sometimes a stovepipe can be extended through a window if no other alternative exists. Replace the window glass with a metal sheet, and run the temporary stovepipe through the metal.

Do not run emergency stove piping close to flammable materials. Be particularly careful with window-mounted flues. The wood sash, curtains and shades are especially flammable.

If you use a catalytic or unvented heater, provide plenty of ventilation in the room. Whenever the device is in use, cross ventilate by opening a window an inch on each side of the room. It is better to let in some cold air than to run the risk of carbon monoxide poisoning.

Do not burn outdoor barbecue materials such as charcoal briquettes inside even in a fireplace.

Do not try to use bottled gas in natural gas appliances unless you have converted the appliances for such use. Also, flues and piping suitable for gas burning appliances may be unsafe for use with higher temperature oil, coal or wood smoke. Have one person as a firewatch whenever alternative heat sources are used. One person should stay awake to watch for fire and to make sure ventilation is adequate. If the firewatch feels drowsy, it may be a sign of inadequate ventilation.

Keep fire fighting materials on hand.

## Responses to Other Heat Loss Problems

During a power failure, keeping warm will be a major problem. However, several other related heat loss problems also should be considered.

1. If it seems likely that the heat will be off for several hours in below freezing temperatures, protect exposed plumbing.

Drain all pipes (including hot water heating pipes) in any rooms where temperature falls below 40°F. You may need to drain only portions of your system.

Drain the sink, tub and shower traps, toilet tanks and bowls, hot water heater, dish and clothes washers, water pumps and furnace boiler.

2. If your water pump is electrically powered, a power outage could restrict your water use.

Save as much water as possible when you drain the system.

Store the water in closed or covered containers, preferably where it will not freeze.

You may use water from your hot water heater and toilet tanks (not the bowls) for drinking and household use. Water from the heating system will be unfit for drinking or other household use.

3. Keep on hand a good supply of candles, matches and at least one kerosene or gas lantern with ample fuel. Also have a dependable flashlight with spare bulbs and batteries.

4. If your water supply is shut off, sanitation will become a problem.

Flush the toilet only often enough to prevent clogging. (Disconnect the chain or lever attached to the toilet handle to prevent children from flushing.)

Provide covered containers for disposing of toilet paper. A portable camper's toilet might be useful.

5. Camp stoves or fireplaces may be used for cook stoves in an emergency.

Meal-in-a-can foods such as stews, soups, canned meats, beans or spaghetti require little heat for cooking, and some can be eaten without cooking.

Cereals, breads, dried meats and cheese are other "no cook" possibilities. Freeze-dried meals used by campers and backpackers can be prepared with a minimum of heat.

## Protecting Your Hot Water System During A Winter Storm Power Failure

1. If you think the heat will be off several hours or more during below freezing temperatures, you will need to keep exposed heating pipes from freezing. This can be done by circulating water through the pipes or adding antifreeze to the system.
2. If electrical power is available, keep the circulator pump going. Moving water does not freeze readily. However, if the room temperature drops to below 40°F, you probably should begin to drain the pipes.
3. Most hot water heating systems are not easily drained. Pipes may have to be disconnected to drain low points. Open the vents on radiators to release air so pipes can drain.
4. Consult a heating contractor about adding antifreeze to your system.

Antifreeze is poisonous and must not be allowed to get into the drinking water system. Make sure the house water system and the boiler water system are not connected.

Use only antifreeze containing ethylene glycol. Do not use antifreeze containing methanol. (Methanol vaporizes readily when heated, and could cause excessive pressure in the system.)

Make sure the antifreeze does not contain leak-stopping additives. These may foul pumps, valves, air vents and other parts.

## Protecting Your Plumbing System During A Winter Storm Power Failure

1. Shut off the water at the main valve, or turn off the well pump if it is in the house.
2. Drain the pressure tank.
3. Open all faucets until they drain completely! Some valves will open only when there is water pressure. If so, remove the valve from the faucet.
4. Drain the entire system by disconnecting pipe unions or joints as close to the main valve as possible. You may use compressed air to blow water from pipes.
5. Insulate undrainable pipes around their main valves. Use newspaper, blankets or housing insulation.
6. Drain toilet flush tanks and spray hoses.
7. Disconnect the water softening unit so water can drain from the hard and soft water pipes and from the controls. Lay the softener tank on its side to drain as much water as possible. Also drain controls and tubing on brine (salt) tank. A brine tank itself will not be harmed by freezing.

## **Protecting Your Sewage System During A Winter Storm Power Failure**

1. Empty all drain traps by carefully removing drain plugs or by disconnecting traps.
2. Blow out inaccessible traps with compressed air or add ethylene-glycol base antifreeze in an amount equal to the water in the trap (1 pint to 1 quart is sufficient, depending on the size of the trap).
3. Check kitchen sinks, bathroom sinks, bathtub drains, toilets, washtubs, showers, floor drains and sump pumps.

## **Protecting Appliances During A Winter Storm Power Failure**

1. Disconnect the electric power or shut off the fuel to all water-using units.
2. Shut off the water supply and disconnect the hoses if possible.
3. Drain all water-using appliances.
4. Check the water heater, humidifiers, ice-making unit of the refrigerator, washing machine and the dishwasher. Do not put antifreeze in these appliances. Close valves to the furnace, water heater and dryer.

## Preventing Ice Dams on Eaves

Ice dams along eaves may cause considerable damage to the roof and inside walls of a house. Poorly insulated roofs are the chief cause of ice build-up on eaves. Ice forms when the snow melts off a warm roof, runs down to the eave line, and refreezes there. Ice in the eave trough prevents water from running off freely. If water backs up high enough, it may seep under shingles and down into the house. Sometimes it leaks through plaster walls and ceiling.

Ice dams are usually a problem only on cold days when the roof is warmer than the eave overhang. On warm days the snow melts at the same rate on the eaves and water runs off freely.

To prevent ice dams:

1. Insulate between the top floor ceiling and the attic, or along the underside of the eaves if the attic is used as living space. Insulation also will help cut fuel bills.
2. Ventilate the attic through windows and louvers when insulation is added to the attic floor. This will help reduce moisture condensation in the attic.
3. Use electric heating cables along the eaves if insulation or ventilation is not possible.

Cables can be strung out along the edge of eaves. When plugged in, they will heat the area, melt any ice already formed and prevent further freezing when water drips off the roof.

Be sure cables are approved for the intended use by the Underwriters Laboratory. Check with your electrician for correct installation.

4. Do not use salt to melt snow or ice from roof. Salt will rust nails, damage gutters and downspouts, and ruin next year's lawn.

## Responses to Take When Caught Outdoors During A Winter Storm

Hunters, sportsmen or snowmobile riders occasionally become lost or injured in severe winter weather. Be sure someone knows where you are going and when you plan to return. Don't travel alone. Dress properly. If you do become stranded:

1. Remain calm. Don't rush to get out immediately. You can easily become disoriented and lose your way during a snowstorm.
2. Build a shelter for the night, preferably on the leeward side of brush or timber.

In timber country a lean-to gives good protection. Construct one by using two "Y" poles for corners and a sturdy cross shaft.

Place poles from cross shaft to the ground and cover with evergreen boughs.

In open country where snow is shallow and the temperature isn't too cold, a snow trench can provide adequate shelter.

"Snow caves" (in snow at least 4 feet deep) provide the warmest shelter during cold weather. Dig your cave on the leeward side of the drift. Be sure that you don't locate the opening under an overhanging drift or in a possible avalanche path.

Cover the bottom of your shelter with boughs, grass or sticks if they are available. Soft, springy boughs are good for a mattress.

3. Gather a fuel supply that will last throughout the night.

Gather fuel while it is still daylight.

Build a fire approximately 2 feet from the shelter, using a log or piled rocks to reflect the heat. When daylight comes again, be prepared to increase the size of the fire. Try to produce as much smoke as possible to signal rescue parties.

4. Remain at your shelter area unless you are positive that you can walk out safely. It is better to wait for rescue than to become disoriented and further lost.

In some areas snowmobile clubs and other groups are organized for rescue operations.

## Responses If Trapped By a Blizzard While Traveling

1. Avoid overexertion and overexposure. Strenuous acts such as pushing your car or shoveling snow can cause a heart attack in cold weather conditions.

2. Stay in your car where you are sheltered and more likely to be found. You can become quickly disoriented when trying to walk around in blowing snow.

3. Stay calm.

4. Keep fresh air in your car.

Freezing wet and wind-driven snow can seal the passenger compartment and suffocate you.

Keep the downwind window open about an inch when you run the motor and heater. Be sure snow has not blocked the exhaust pipe.

5. Exercise from time to time by clapping hands and moving arms and legs vigorously. Don't stay in one position long.

6. Keep the dome light on at night to make the car visible to snow plows or rescue crews.

7. Have one person keep watch. Don't allow everyone in the car to sleep at once.

8. In a snowstorm, automobile parts can sometimes be used for emergency tools:

A hubcap or sun visor can be used as a shovel.

Seat covers can serve as blankets.

Floor mats will help shut out wind and cold. Place them against windows on the upwind side to help reduce drafts.

Engine oil burned in a hub cap creates a smoke signal visible for miles. To light the oil, prime with a little gasoline or use paper for starter fuel.

Signal with the horn. An automobile horn can be heard as far as a mile downwind.

## Special Considerations for Agricultural Producers

In addition to the precautions and responses covered in the previous pages, the agricultural producer will want to consider the following measures.

### Preparing for a Winter Storm

1. Be aware of winter storm terminology. Stockman advisories are issued with combinations of cold, wet and windy weather, specifically, cold rain and/or snow with temperatures of 45°F or colder and winds of 25 miles per hour or higher. If the temperatures are in the mid-30s or lower the wind speed criteria are lowered to 15 miles per hour.
2. Stockmen also should consider the effect of the wind chill factor on livestock.

### Providing Windbreaks for Livestock Protection

1. Simple shelters, sheds or windbreaks are necessary to protect livestock from winter storms.

Usually, severe cold alone will not affect the performance of animals on full feed. Wind, however, can be a serious stress factor. A strong wind has about the same effect on animals as exposure to a sudden drop in temperature.

In general, a 20 mph wind is approximately equivalent to a 30°F drop in temperature. Under extreme conditions, simple wind and snow protection devices will not be 100 percent effective.

2. Consider wind and snow as a joint problem when deciding the kinds of livestock protection you need.
3. Simple windbreaks, shelters or sheds are essential for livestock protection from wind and snow.
4. The effectiveness of a windbreak depends on its height and density. Windbreaks may be natural (trees) or manmade (fences).
5. Cottonwood or poplar trees are relatively ineffective as windbreaks because of their low branch density. Supplement these trees with thick-growing trees such as red pines, or with fences.
6. Snow fences can be good substitutes for tree windbreaks which take time to grow and are not practical under all conditions.
7. Porous fences of 80 percent density offer the best wind protection.
8. Snow will drift through a porous fence. A solid fence keeps most of the snow outside a yard and provides the best snow barrier, but may direct snow to other parts of the farmstead. Porous fences can give good snow control if you locate the fences to allow for the resulting drifts.

9. Swirling and relocation of snow within a farmstead is often the main cause of drifting problems.

10. Shallow open-front sheds provide excellent shelters for livestock. Such shelters should have slot openings along the eaves on the back side of the shelter. These openings will provide ventilation and prevent snow from swirling into the front of the shed.

Plan slot size according to building width.

You should have a 1- to 2-inch opening per 10 feet of building width. Ridge ventilators also are recommended.

11. Do not attach windbreak fences directly to the front corner of an open-front shed. Instead, use a swirl chamber arrangement.

Attach a separate short fence to the building.

Start the longer fence behind it and away from the building.

12. Divide long open-front sheds into 20- to 40-foot sections to reduce drafts and possible snow build-ups.

13. Locate shelters so that adjacent buildings will not deflect wind and snow into a shed.

## Creating Windbreaks On Your Property

1. On some farms a windbreak may be necessary for protection from strong winds and blowing snow. A windbreak will:

Protect livestock and reduce winter feed requirements.

Help protect homes and reduce fuel use.

Help eliminate snow drifting around farmstead buildings and work areas.

2. Plan the windbreak before you plant. In designing the windbreak you should consider size and location, tree species, tree spacing and soil preparation.

3. To give the best protection from wind and snow a windbreak should be:

Located to the northwest of the farmstead

L-, U- or E-shaped, with the ends extending about 50 feet beyond each corner of the area to be protected

At least 50 feet and preferably 100 feet from farm buildings and feedlots on level land (If your land slopes steeply to the north or west, plant trees closer to the farmstead, but no closer than 60 feet from the main buildings or drives.)

4. Avoid planting windbreaks across old feedlots, near manure pits or across barnyard drainage ways. Many trees, especially evergreens, are susceptible to "nitrogen burning." If any section of the windbreak is likely to be saturated by barnyard seepage, plan to construct a ditch or use drainage tile to carry the seepage away from trees.

5. Do not plant windbreaks where they could cause visibility hazards at intersections.

6. If it is necessary to cross fields, driveways or large ditches with a windbreak planting, try to make the crossing at oblique angles. This will prevent direct wind tunnels through the planting.

7. Windbreaks should contain several tree species.

A mixture of species offers protection against disease, insects and weather damage, and takes advantage of differences in growth rates.

Both deciduous and evergreen species should be included, but all trees must have adequate space.

Select low, dense growing shrub for outside rows. Plant medium sized trees next, and tall growing trees in center rows.

Your choice of species will depends on your needs, climate and type of soil. Contact your county Extension agent for information about appropriate windbreak species for your area.

8. Sod, loosely powdered soil or field soil is best for tree planting. In late summer or early fall, plow heavy soil and soil covered with sod. If the soil has been deeply plowed and is relatively loose, roll or cultipack it.

During winter months cover light or sandy soils with organic material such as well-rotted manure. This will increase soil fertility and reduce the possibility of erosion and moisture losses during winter and early spring.

In dry regions summer fallow the land during the year prior to planting. Cultivate frequently enough to prevent any weed or plant growth and to keep the soil in suitable condition for absorbing moisture.

If the soil is sandy and subject to blowing, plant a cultivated row crop such as corn instead of summer fallowing.

Thoroughly disc and harrow the soil just before planting.

9. Do not overcrowd trees. Trees must have adequate space, especially when deciduous and evergreen species are mixed.

Allow at least 20 feet between deciduous and evergreen species.

A five-row planting is recommended for the most efficient windbreak but if space is limited use fewer rows rather than overcrowd trees.

Properly spaced trees will have increased growth and vigor.

Stagger trees in adjacent rows to offset wide spaces between young trees. Be sure to allow enough space for operating any necessary maintenance equipment.

10. Plant trees as soon as possible after receiving them. If you must hold trees for a few days before planting them, unpack them and heel them in until they are to be planted.

Keep roots moist at all times during planting.

Plant in rows according to predetermined plan.

For specific planting instructions, contact a local nursery or your county agricultural Extension agent.

11. Provide protection and care for young seedlings.

Protect trees permanently from poultry and livestock.

Protect trees from rodents. Use screen wire, tree wrap materials or commercial repellents.

Inspect trees periodically for disease or insect damage.

To eliminate competition from grass or weeds, cultivate until crowns of trees have grown together and shade the ground, preventing growth of competitive vegetation.

Be sure cultivation is shallow to avoid damaging the roots.

For fire protection cultivate a strip on all sides of the windbreak.

## Protecting Livestock During Winter Storms

Large numbers of livestock may be killed in winter storms. Wind coupled with severe or prolonged cold weather causes additional stress on livestock, increasing their need for food, water and shelter. To minimize livestock loss during winter storms, stockmen should:

1. Move stock, especially the young, into sheltered areas.

Windbreaks, properly oriented and laid out, or timber-covered lowlands are better protection for range cattle than most shed-type shelters which may overcrowd and overheat cattle, causing subsequent respiratory disorders.

Never close indoor shelters tightly because stock can suffocate from lack of oxygen.

Extremities that become wet or are normally wet are particularly subject to frostbite and freezing during sub-zero weather. The loss of ears or tails may be of little economic significance, but damage to male reproductive organs can impair the animals' fertility or ability to breed.

2. During severe or prolonged cold weather, animals need extra feed to provide body heat and to maintain production weight gains.

A grain ration that maintains an animal during the summer may not carry it through the stress of prolonged or severe cold. Haul extra grain to feeding areas before the storm arrives.

If the storm lasts for more than over 48 hours, emergency feeding methods may be required. Pelleted cake or cake concentrates make good emergency feed.

Mechanized feeders may be inoperable during power failures unless you have a source of emergency power.

3. Use heaters in water tanks to provide livestock with enough water. Cattle cannot lick enough snow to satisfy their water requirements.

## Caring for Livestock After a Blizzard

1. Following a blizzard, water will be a crucial need for livestock. Cattle will not be able to satisfy all of their water requirements by eating snow.

In pastures with severe drifting, water in shallow streams may be absorbed by snow in the stream bed. Very little, if any, running water may be available for several days. You may need to haul water to cattle. If water is limited, keep cattle off salt. Cattle which have been away from feed and water for several days may overeat salt, causing salt poisoning.

2. When stock cannot be reached by roads, use planes, helicopters or snowmobiles to provide emergency rations.

## Feeding Cattle After a Blizzard

1. Feedlot cattle that have gone through a severe storm or stress period should be put back on feed carefully.

Change the ration gradually from a low to a high proportion of concentrate. Watch your herd carefully for several weeks following prolonged exposure.

Isolate cattle showing signs of scouring or labored breathing. Keep these animals in a dry, draft-free place and contact a veterinarian.

2. Cattle which have not been fed for several days or are unaccustomed to grain should be limited to 2 to 4 pounds per head of whole grain in one feeding, or a total of 5 pounds per head the first day.

Increase the amount of feed by 2 lb/head/day for large cows. Make any additional increases slowly.

3. Add hay, even poor quality roughage, to the ration as soon as possible. Feeding 3 pounds per head of hay daily will greatly reduce the possibility of founder (acute indigestion). Cattle can use hay to better advantage than grains when they must be fed on the ground. Even moisture-saturated hay can be used until suitable feed is available. Do not use mildewed hay.

4. Grind whole grains to increase their value to cattle. Half of some whole grains may pass through cattle undigested.

5. Watch cattle for signs of founder.

Founder is caused by cattle eating large amounts of green corn or other easily fermentable feeds to which they are unaccustomed.

Founder occurs suddenly. Body temperature is usually normal. Symptoms include poor appetite and depression, followed by colic and diarrhea.

Animals may die in a few days. Some survivors may develop acute lameness. Prompt treatment can reduce deaths, crippling and recurring digestive disturbances.

## **Feeding Sheep After a Blizzard**

1. If sheep, especially pregnant ewes, are withheld from feed heavy losses may occur.
2. Ewes in good flesh late in pregnancy may incur pregnancy disease if they are without feed for even a short time. Early symptoms of pregnancy disease include listlessness and depression. As intoxication advances, ewes develop a wobbly gait, become uncoordinated and die.
3. Sheep can eat 1 to 3 pounds of whole grain per day. A small amount of roughage will prevent digestive trouble. Drying feed before giving it to sheep can reduce the possibility of digestive problems.

## **Feeding Horses After a Blizzard**

1. Horses fed a maintenance ration adequate for summer conditions may need additional energy in their winter feed.
2. They can tolerate reduced rations for a few weeks unless they are mares nursing foals.

## **Feeding Swine After a Blizzard**

1. Swine present few problems during periods of feed shortage.

If you are substituting other feed, such as dairy feed, for regular swine feed, be sure swine have adequate fresh water available at all times. The salt content of cattle feed will produce salt poisoning in swine unless they have constant access to water.

## Protecting Poultry and Livestock During a Winter Storm Power Failure

1. Ventilate shelter. Do not close buildings tight to conserve heat because animals could suffocate from lack of oxygen. Because oxygen eventually will be used up in mechanically ventilated production facilities, clear ice and snow from all vents. Then open vents to facilitate natural air flow.
2. Poultry facilities should be equipped with knock-out panels for emergency ventilation.
3. In dairy facilities, open door or turn cows outside.
4. Provide water. All animals, especially cattle, need plenty of water during cold weather. It may be possible to drive your water pump with a small gasoline engine and a belt. Otherwise, you will need to haul water.

If you have an outside source of water, cattle can be turned out to it. Be sure to place sand or other gritty material on icy feedlots to provide good footing.

Whatever the source of water, watch that it remains unfrozen so animals can drink it. If no water is available, dairymen can feed cows their own milk as a last resort.

5. Provide heat. Use camp stoves and heaters as emergency heat sources for brooders. Plan ahead to have this equipment ready when needed.
6. Provide feed. Animals need extra energy for body heat during severe or prolonged cold weather, especially if they are outside without shelter. Mechanical feeders will be inoperable during a power failure. Provide for emergency feeding procedures. Pelleted cake or cake concentrate may be used for emergency feed.

## **Protecting Equipment During A Winter Storm Power Failure**

1. Unplug or turn off all electric equipment to prevent damage when power is restored.
2. If you use portable space heaters for supplemental heat, close off the fuel valve as soon as possible after power is interrupted. On models not equipped with safety shut-offs, and especially on some models with gravity feed fuel systems, fuel continues to flow even when the burner is inoperative. An explosion or fire can result when power is restored.

## **Storing Milk and Cream During A Winter Storm Power Failure**

1. You can use the intake manifold on the tractor engine as a source of vacuum to operate milkers that do not have a magnetic pulsator.
2. Ask the dairy to pick up milk as soon as possible.
3. Consider adding a standby power generator to handle vital electric equipment on the dairy.
4. Even if you are short of extra milk storage facilities, do not store milk in stock tanks or other containers such as bathtubs. Dairy plants may not accept milk that has been stored in anything other than regular milk storage containers. Check with your local dairy about policy regarding emergency storage of milk and cream.
5. Check your tank for souring each time you add milk to it if you are unable to cool your milk or have it picked up. This check could mean the difference between losing all or only part of your milk supply.

## Repairing Ice and Snow Damage to Shrubs and Trees

1. To prevent ice damage to trees or shrubs, try to remove ice before winds cause major damage. Do not try to break ice off branches. Connect a garden hose to the hot water faucet to melt the ice. If branches have been badly damaged, remove or repair them as suggested below.

2. Heavy accumulations of wet snow can cause damage to trees and shrubs. Evergreens and weak-wooded trees are more susceptible to snow damage than deciduous and hard-wood trees.

Snow damage is more common to shrubs than to trees because snow depth often equals or exceeds shrub height. Evergreen shrubs are more easily damaged than deciduous shrubs because there is more foliage surface for snow accumulation.

To remove heavy snow accumulations:

Tap the branches lightly with a broom soon after the snow falls or as it accumulates.

If snow has melted and refrozen, do not use this procedure because you could break the branches.

To remove frozen snow, spray the shrubs with a hose connected to the hot water faucet.

Shrubs also may be damaged when snow from walks or drives is piled onto them, or when salt is used for snow removal along drives, walks and streets. With a hose, wash off shrubs that have been splashed with salt from streets. Often snow damage to evergreens is not apparent until the following spring as a broken branch will retain its green color until warm weather.

3. Determine whether the tree can be repaired, or if it should be removed completely. If the main trunk is completely broken or if the tree is uprooted, it should be removed. Most broken branches can be either repaired or pruned. Some branches broken at a crotch can be lifted into place and then bolted and cabled.

Remove broken branch to the nearest branch or to the tree trunk. Never leave a ragged stub.

Remove large branches with three cuts. This will prevent splintering and peeling.

Make the first cut upward from the bottom of the branch about 12 inches from the next branch.

Cut about halfway through the branch, or until the saw begins to pitch.

Make the second cut 5 or 6 inches further out, and continue cutting until the branch falls.

With a third cut remove the stub cleanly without peeling.

Treat wound.

Information in this document was compiled by the Texas Agricultural Extension Service  
and Hazard Reduction and Recovery Center