

tornadoes



Tornado Preparedness and Response

STRATEGIES FOR FAMILIES

BE PREPARED

Tornadoes are common in Wisconsin and worth taking seriously. The most violent tornadoes are capable of tremendous destruction with wind speeds of 250 miles per hour or more. Damage paths can be in excess of a mile wide and 50 miles long. When a tornado is coming, you have only a short amount of time to make life-or-death decisions. Advance planning and quick response are the keys to surviving a tornado.

A tornado is defined as a violently rotating column of air extending from a thunderstorm to the ground. It usually forms when weather is warm, humid and unsettled, and often in conjunction with severe thunderstorms. Direction of movement usually is from the southwest to the northeast, but a tornado's path may be erratic. Likewise, tornadoes tend to occur between 3 and 8 p.m., but they may occur any time.

- ◆ *Conduct tornado drills each tornado season.* Designate an area in your home as a shelter and practice having everyone in the family go there in response to a tornado threat. A basement, storm cellar or lowest level of your home is best. If there is no basement, use an inner hallway or a small inner room without a window, such as a bathroom or a closet.
- ◆ *If you live in a mobile home, plan to take shelter in another building with a strong foundation.* Some mobile home parks provide shelter for residents. If your park does not have a community shelter, consult with the management and request that one be provided.
- ◆ *Know the difference between a “tornado watch” and a “tornado warning.”*
 - a) A tornado watch is issued by the National Weather Service when weather conditions are such that tornadoes are likely to develop. When a watch is announced, you should listen to the radio or television for further developments; keep a battery-powered radio on hand in case electrical power is lost; and tie down loose objects outside or bring them inside.
 - b) A tornado warning is issued when a tornado has been sighted or indicated by radar. At this point, the danger is very serious and everyone should go to a safe place, turn on a battery-operated radio or television and wait for the “all clear” by the authorities.
- ◆ *Have emergency supplies on hand.*
 - a) Flashlights and extra batteries
 - b) Portable battery-operated radio and extra batteries
 - c) First-aid kit and manual; essential medicines
 - d) Emergency food, water, cooking equipment, can opener
 - e) Cash and credit cards
 - f) Sturdy shoes
- ◆ *Develop an emergency communication plan.* In case family members are separated during a disaster because of work or school, choose a long-distance relative or friend to serve as the “family contact.” After a disaster, it is often easier to call long-distance than to make a local call. Make sure everyone in the family knows the name, address and phone number of the contact person.

AFTER A TORNADO

◆ Gas leaks. If you smell the putrid odor of leaking gas, leave your home immediately and call the gas company. Lanterns, torches, electrical sparks and cigarettes could cause an explosive fire if there is a leak. Do not turn on any light switches.

◆ Electrocution. Check utility lines and appliances for damage. If electrical wiring appears damaged, turn off the current at the main fuse box or circuit breaker.

◆ Structural damage. Watch for falling debris and the possibility of collapse.

◆ Water. If water pipes are damaged, do not use water from the tap; it may be contaminated. Damaged sewage systems should be serviced as soon as possible – they are health hazards.

Additional resources:

Your local emergency government office, the American Red Cross, your county Extension office, the Wisconsin Division of Emergency Government, the Federal Emergency Management Agency

Related publications:

"Tornado Awareness," Wisconsin Division of Emergency Government, 1991.

DURING A TORNADO

If you are at home during a tornado:

- ◆ *Go at once to the basement, storm cellar or the lowest level of the building.* If there is no basement, go to an inner hallway or a small inner room without a window, such as a bathroom or a closet.
- ◆ *Get away from windows.*
- ◆ *Go to the center of the room.* Stay away from corners because they tend to attract debris.
- ◆ *Get under a piece of sturdy furniture such as a workbench or heavy table.*
- ◆ *Use your arms to protect your head and neck.*

If at work or school:

- ◆ *Go to the basement or to an inside hallway at the lowest level.*
- ◆ *Avoid wide rooms such as auditoriums, cafeterias or large hallways.*
- ◆ *Get under a piece of sturdy furniture such as a workbench, heavy table or desk.*
- ◆ *Use your arms to protect your head and neck.*

If outdoors:

- ◆ *If possible, get inside a building.*
- ◆ *If shelter is not available or there is no time to get indoors, lie in a ditch or low-lying area or crouch near a strong building.*
- ◆ *Use your arms to protect your head and neck.*

If in a car or truck:

- ◆ *Never try to outdrive a tornado.* Tornadoes can change direction quickly and can lift up a car or truck and toss it through the air.
- ◆ *Get out of the car immediately and take shelter in a nearby building, ditch or low-lying area away from the vehicle.*

Protecting Homes From Lightning

WHAT TO DO BEFORE LIGHTNING STRIKES

Three protective measures will help safeguard your home from lightning: a lightning-rod and ground system, a grounded TV antenna and grounded appliances. These devices are particularly important if you live in an area subject to frequent or severe thunderstorms. Unless you have the expertise, have only licensed electrical contractors install these systems.

LIGHTNING-ROD SYSTEMS

Lightning-rod and ground systems, if properly installed, are believed to be at least 90 percent effective in preventing damage should a lightning strike occur. They were more common years ago, when they were sold door to door with high pressure tactics. Today, fewer homes have such systems, perhaps because people feel the \$1,500-plus cost outweighs the risk. Just what is the risk? One estimate says a Wisconsin home is likely to be struck by lightning once every 350 years.

A good lightning protection system has five components:

- ◆ The lightning rod or air terminal intended to intercept the strike. Some metal roofs can be used as air terminals.
- ◆ A cable capable of conducting the electrical charge safely to the ground.
- ◆ The ground connector, which provides contact with the earth so that the lightning can be safely dissipated.
- ◆ The bonding between the first three components so that no side flash occurs at the joints because of a poor connection.
- ◆ The lightning arrester or surge protector. Arresters guard against damage that may occur from lightning that strikes a nearby power line, phone line or other wire entering the house.

Quality components and proper installation are both important. If you are purchasing a system be sure it has been approved by the Lightning Protection Institute or Underwriters Laboratory. Also be sure that the contractor is listed or certified by one or both of these groups.

GROUNDED TV ANTENNAS

Even if you have a lightning rod system, outdoor television antennas should be grounded. The “core of protection” created by a grounded high point probably extends downward at a 45-degree angle all around the high point. A grounded antenna is no substitute for a lightning-rod system, however.

If you have a lightning-rod and ground system, the TV can be grounded by connecting the mast to the rod system. The ribbon lead-in should run through the arrester; the arrester should be grounded to one of the lightning-rod grounds. The arrester should be located at a lower level (closer to the earth) than the TV set.

GROUNDING APPLIANCES

Appliances are more frequently burned out by electrical surges from nearby lightning strikes than from direct lightning. Lightning does not have to strike the distribution line to cause such a surge. To protect appliances, have a “secondary lightning arrester” installed in the service wires at the point where they drop to the house. Your electric power supplier can tell you where to purchase these secondary arresters and what kinds would be best for your electrical system.

SURGE PROTECTORS

A relatively inexpensive way to protect electronic equipment from power surges is through use of surge protectors. These devices are typically attached between the appliance and the wall outlet. They protect delicate electronic components in appliances such as microwave ovens, computers and VCRs from power surges caused by lightning or other sources. You can purchase surge protectors at computer and office-equipment stores.

Additional resources:

Your county Extension office, your electric power supplier, licensed electrical contractors, the Lightning Protection Institute

Standby Electric Generators

A SOURCE OF EMERGENCY POWER FOR FARMERS

An emergency source of power is important for any farm with mechanically ventilated production facilities, bulk milk handling equipment, mechanical feeding equipment or facilities requiring constant and continuous heat (such as brooders). On such a farm, a standby electric generator is a good investment, possibly preventing costly losses during a power failure.

During disasters such as flood or tornado, relief agencies may provide generators to farmers on an emergency basis.

TYPES OF GENERATORS

Standby generators are either engine driven or tractor driven. Either type can be stationary or portable. Engine driven units can be either manual or automatic start. Gasoline-, LP gas- (bottled gas) and diesel-fueled engines are available.

Generators must provide the same type of power at the same voltage and frequency as that supplied by power lines. This is usually 120/240 volt, single phase, 60 cycle alternating current (AC). An air-cooled engine is often used for generators up to 15 kilowatts. A liquid-cooled engine is necessary for generators larger than 15 kilowatts. Engine capacity of 2 to 2 1/4 hp with the proper drive system must be available for each 1,000 watts of generator output.

SIZE OF GENERATORS

A full-load system will handle the entire farmstead load. Automatic engine-powered, full-load systems will begin to furnish power immediately, or up to 30 seconds after power is off. Smaller and less expensive part-load systems may be enough to handle essential equipment during an emergency.

Power-take-off (PTO) generators are about half as costly as engine-operated units. Under a part-load system, only the most essential equipment is operated at one time. For most farms, this type of system is adequate, provided the generator is sized to start the largest motor. For example, the milk cooler or ventilation fan would need to be operated continuously, but the operation of the silo unloader and mechanical feeding system could be postponed until the milking chores are completed. PTO units can be mounted on a trailer.

INSTALLATION

Wiring and equipment must be installed in accordance with the National Electrical Code, local ordinances and the requirements of your power supplier. It is essential that you have the proper equipment for disconnecting the generator from public utility lines. Most companies require the installation of a double-pole double-throw transfer switch or its equivalent for this purpose. Check with your electrician or power supply representative for installation, installation instructions and inspection.

LOCATION AND SAFETY FEATURES

- ◆ Large engine generators should be located in a building, preferably a heated building.
- ◆ Inlet and outlet air ducts must be large enough to carry off excess heat. They should be open at least a half a square foot for each 1,000 watts of generator capacity.
- ◆ Combustion fumes must be carried outdoors safely. Exhaust pipes must be at least 6 inches from combustible material.

OPERATION

An automatic standby unit should start automatically when power fails, and stop when power is restored. When using an engine-driven generator with a manual start, or when using a tractor driven unit, follow this procedure when power fails:

- ◆ Call your power supplier and advise them of the conditions.
- ◆ Turn off or disconnect all electrical equipment.
- ◆ Position the tractor or engine for belt of PTO drive.
- ◆ Start the unit and bring the generator up to proper speed (1,800 or 3,600 rps). Check on arrangement to carry off exhaust fumes. Be sure there is no danger of fire. The voltmeter will indicate when the generator is ready to carry the load.
- ◆ Put the transfer switch in the generator position.
- ◆ Start the largest electrical motor first, adding other loads when each is up to operating speed. Do not add too much too fast. If the generator cuts out for any reason, repeat the second, third and fourth steps above.
- ◆ Check the voltmeter frequently. If voltage falls below 200 volts for 240 volt service or below 100 volts for 120 volt service, reduce the load on the generator by turning off some electrical equipment.
- ◆ When commercial power is restored, put the transfer switch in normal power position. Then stop the standby unit.

Additional resources:

Your county agricultural agent

Related publications:

UW-Extension publications–

“Standby Electric Power Equipment for the Farm and Home,” (AF2273);

“Electrical Systems for Agricultural Buildings,” (checklist), (A8NE846);

“Electrical Systems for Agricultural Buildings,” (recommended practices), (A8NE845).

“Standby Power,” Illinois Farm Electrification Council, Fact Sheet #2.

MAINTENANCE

- ◆ Keep the unit clean and in good running order at all times so it will be ready for immediate use. Dust and dirt accumulations on the motor can cause it to overheat when operated.
- ◆ Follow maintenance instructions in manufacturer's manual. A short operation at set intervals will keep the engine in good operating condition. Regularly scheduled warm-ups are necessary to keep a standby engine in working order.

Salvaging Food After a Tornado

FOOD SAFETY IN THE EYE OF A DISASTER

Damaged food supplies, water contamination and temporary loss of refrigeration may be critical issues for you as a tornado survivor. While structural damage may be the initial focus in your home, some basic precautions can keep your food stores safe and your family healthy as you begin clean-up efforts.

If you live in an area susceptible to tornadoes, keep an adequate supply of food, bottled water and emergency equipment on hand. This includes enough canned food to last four to five days, a hand can opener, battery-powered radio, extra batteries and emergency cooking equipment like a camp stove with fuel to operate it.

Additional resources:

Your county family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency

Related publications:

UW-Extension Publications—

“Management of Food for Emergencies,” (B3045);

“Quick Consumer Guide to Safe Food Handling,” (BG248);

“When the Home Freezer Stops,” (B2837);

“Keeping Food Safely,” (B3474).

USE CAUTION WITH WATER AND FOOD SUPPLIES

The water supply may be disrupted or contaminated after an area has sustained a tornado. Food in damaged buildings and homes may be hazardous. Follow these precautions:

- ◆ Drink only approved or chlorinated water.
- ◆ Consider all water from wells, cisterns and other delivery systems in the disaster area unsafe until tested.
- ◆ Check foods and discard any containing particles of glass or slivers of other debris.
- ◆ Discard canned foods with broken seams.

REFRIGERATION AND FREEZER CONCERNS

If the electricity is off to the refrigerator or freezer, follow these guidelines:

- ◆ Discard refrigerated meats, seafood, milk, soft cheese, eggs, prepared foods and cookie doughs if they have been kept above 40 degrees F. for over two hours. Also discard thawed items that have warmed above 40 degrees F., with the exception of breads and plain cakes.
- ◆ Discard any refrigerated items that turn moldy or have an unusual odor or appearance.
- ◆ Refreeze partially or completely frozen foods.
- ◆ Cold but fully thawed, uncooked meat, fish or poultry should be checked for off-odor. If there is none, cook and eat or cook and refreeze.
- ◆ Discard combination dishes such as stews, casseroles and meat pies if they are thawed.
- ◆ Refreeze thawed (but cold) juices, baked goods, and dairy items such as cream, cheese and butter.
- ◆ Do not refreeze thawed vegetables unless ice crystals remain. Cook and use them if there are no off-odors.

Disinfecting Dishes, Cookware and Utensils

SAFETY GUIDELINES AFTER A DISASTER

DISASSEMBLE, WASH AND DISINFECT

During a disaster such as a flood, tornado or fire, kitchen items easily can become contaminated. Floodwaters may contain silt, raw sewage, oil or chemical wastes, while fires may leave residues from toxic fumes or fire-fighting chemicals. Before using any item that has come in contact with these substances, follow the guidelines at right.

Take apart any item that can be cleaned in pieces. If possible, remove handles from pots. If you have a dishwasher and the hot water temperature is at least 140 degrees F., use a long wash cycle and heated drying cycle to clean and disinfect dishwasher-safe items. Regarding other items, or all items if you don't have a dishwasher, follow these steps:

- ◆ Wash all items in a strong detergent solution. Use a brush to remove dirt. Rinse in hot water.
- ◆ Immerse glass, porcelain, china, plastic dinnerware and enamelware for 10 minutes in a disinfecting solution of 2 tablespoons of chlorine bleach per gallon of hot water.
- ◆ Disinfect silverware, metal utensils, and pots and pans by boiling in water for 10 minutes. Chlorine bleach should not be used in this case because it reacts with many metals and causes them to darken.
- ◆ Air-dry dishes. Do not use a towel.
- ◆ Discard and replace soft, porous plastic or wood items saturated by floodwater, since they cannot be sanitized. These include baby bottles, nipples and pacifiers.
- ◆ If cupboards and counters come in contact with floodwater, clean and rinse them with a chlorine bleach solution before storing dishes.

Additional resources:

Your county family living agent, the American Red Cross, the Federal Emergency Management Agency

Related publications:

"Repairing Your Flooded Home,"
American Red Cross/Federal
Emergency Management Agency, 1992.

Inspecting Farm Buildings for Wind Damage

SAFETY CHECKS AFTER A STORM

Wind damage to buildings is not always readily apparent. For this reason, examine all farm buildings for hidden damage after a severe windstorm or tornado. Undetected damage could weaken a structure, creating possible hazards. Prompt repair is usually less expensive in the long run.

ROOF

- ◆ *Damaged or missing shingles.* Check asphalt shingles for cracks at the butt end, where they may have been weakened from flexing. Make sure individual shingles have not blown off. Thoroughly inspect shingles on the ridge, gable ends and eaves.
- ◆ *Loose nails on metal roofing.* Inspect the entire roof, with particular attention to gable ends, eaves and ridge cap. If nails have worked loose, re-nail them as soon as possible. If the nails don't hold when hammered back in, use #12 or #14 metal screws to fill old nail holes. (Use aluminum screws on aluminum and steel screws on steel.) In addition to screws, re-nail 3 to 4 inches away with ring or screw-type nails.
- ◆ *Potential leaks.* On a sunny day, check the roof carefully from inside with the building doors closed. While looking for holes in the roof, inspect the ridge, gable ends and eaves for possible structural separation.

FOUNDATION

Inspect the foundation. The plate should not be separated from the studding where the foundation meets the walls. On block foundations, inspect mortar joints to make sure the block with the plate bolt in it hasn't separated from the wall. On stone or concrete foundations, check to see that the plate bolts have not worked loose.

SILLO

Make sure the silo is still plumb. Look for loose hoops. Inspect the roof to be sure it remains fastened to the silo. Inspect the base of metal silos inside and outside for hairline cracks. If there is rust around the base, remove it with a wire brush. Then check for cracks and apply a rust preventive paint. Look for new cracks in the plaster of empty concrete stave silos.

INTERIOR

Inspect the interior of buildings for structural damage. Using a good light, check the framing. Look for ridge separation, loose knee braces and loose rafters where the rafters join the walls.

Additional resources:

Your county agricultural agent

Assessing Roof Damage After a Tornado

REPAIR STRATEGIES FOR HOMEOWNERS

If your roof has suffered structural damage from a tornado, make family safety your first priority. In some cases, such as a partially collapsed roof, you may need to relocate until repairs are made. Next, report damage to your insurance company. If you must make temporary repairs before an insurance adjuster's visit, take photographs or make a videotape of damage. You will need good records for insurance claims, applications for disaster assistance and income tax deductions.

WORKING WITH YOUR INSURANCE COMPANY

Call your insurance agent about the damage to your home and roof so that your agent can file a claim. The sooner you talk to your agent, the sooner your claim will be filed and an adjuster will inspect your damage. The amount of coverage for your loss depends on your policy. But even if you don't have full coverage, your agent may be able to give you advice on where to get help with repairs.

Because some damage may not be discovered until repairs are underway, don't be in a hurry to settle your insurance claim. Instead, keep your insurance agent apprised of repair estimates and repairs; have your building contractor or roofer discuss repairs and estimates with your agent if possible. Only settle your claim when you feel all repairs are known and/or made. That way, if related problems such as water damage, foundation damage or the need for new wiring are uncovered during reconstruction, your insurance settlement may reflect these as well. (See the fact sheet "Insurance Coverage and Making a Claim.")

TEMPORARY REPAIRS

If temporary repairs are needed before the professionals arrive, be sure that only a physically able person is allowed on the roof. Unsteadiness on the ladder or roof can lead to severe injuries. If the roof is sagging from structural damage, wait for a professional to assess damage and make repairs; a sagging roof may unexpectedly collapse.

Cover holes in the roof, walls or windows with boards, tarps or plastic sheeting. If possible, place tarps or plastic over the ridge so rain rolls off. Nail down plastic sheets or trash bags with strips of wood and secure them with duct tape. If the holes are large, you may need to support the plastic in the center to keep it from ripping from the weight of the rain.

If sections of the roof or floors are sagging, have a contractor or other knowledgeable person brace weak areas. Improper bracing may increase damage and the chance of injury, so do not attempt this work unless you are experienced in structural repairs.

PERMANENT REPAIRS

If damage is limited to non-structural elements such as shingles, flashing and sheathing, contact a professional roofer for the work. If damage is structural in nature, hire a general contractor. (See the fact sheet, "Hiring

a Contractor After a Disaster.”) A general contractor can replace the entire roof structure or portions of the roof as necessary, in addition to handling related repairs. If the contractor does not have roofing expertise (e.g. shingles, sheathing, etc.), he may subcontract this portion of the work to a specialist.

Additional resources:

Your family living agent, your local emergency government office, the American Red Cross, the Federal Emergency Management Agency