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Fire Prevention and Safety Measures around the Farm¹

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Barn fires are a farm owners worst nightmare. Most have tragic results whether it is the loss of human life, an animal, valuable equipment or the building structure itself. The majority of all barn fires are the result of carelessness and a lack of fire safety knowledge. Insurance statistics show that the two most common times of the year for barn fires are summer and winter. Summer fires are often the result of electrical storms or spontaneous combustion of hot hay. Winter fires are caused by appliances, rodents chewing through wires or the accumulation of dust and cobwebs on electrical surfaces. This fact sheet will explain to horse owners and others the short and long term precautions that should be taken to help reduce the incidence of barn fires.

Farm owners and managers should be able to identify potential fire hazards around the farm:

Highly Flammable or Combustible Materials - If at all possible, hay, straw and other types of bedding should not be stored in the same building in which livestock is housed. Care should be taken that these materials are not stored with machinery or near any type of electrical or heat source. Highly flammable materials may include:

- Hay and straw
- Bedding material (especially sawdust and shredded newspaper)
- Cobwebs, dust, and grain dust
- Horse blankets

- Paint
- Fertilizer
- Pesticides and herbicides

Accelerants - Accelerants are substances that increase the speed at which a fire spreads. All accelerants are highly flammable or combustible, but not all highly flammable or combustible materials are accelerants. Accelerants must be stored in approved containers and properly labeled as such (plastic milk bottles do not qualify as approved containers for storing chemicals). An updated list of all chemicals on the farm should be maintained. The list should include the name of the chemical, date purchased, the quantity of the chemical, and the place of storage on the farm. This list should be kept in a safe, handy place such as a farm office (not in the building where the products are stored). In case of a fire, the list should be given to the fireperson in charge to aid the fire department in knowing what potential toxic fumes or explosions may result and how best to contain the situation. Common accelerants include:

- Gasoline
- Kerosene
- Oil
- Aerosol cans

Ignition Sources - An ignition source is something that can cause an accelerant or flammable material to ignite or smoulder. Examples of ignition sources are:

- Cigarettes and matches

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- Sparks from welding machines and machinery (trucks, tractors, mowers)
- Motors
- Heaters
- Electrical appliances
- Fence chargers
- Electrical fixtures and wires
- Batteries
- Broken glass
- Chemicals which may react with each other or with water or dampness

BARN CONSTRUCTION

When constructing a new building in which to house horses and/or livestock, precautions should be taken to reduce the chance of barn fires. Many of these measures are required by the townships building code. Always check with the town building inspectors office for the requirements and permits necessary in your area.

Many insurance companies will lower premiums if extra fire safety precautions are taken during the construction of a new building, some of which may be above and beyond the standards required by the township. Check with industrial insurance companies regarding which features will possibly lower insurance premiums. Extra measures may include:

- Approved Fire doors
- Fire wall between hay/bedding storage and the actual stabling area
- Use of materials that are flame retardant or fire resistant
- Use of fire retardant latex paint - preferably two coats
- Installation of smoke detectors, fire alarm and sprinkler systems - all of which can be monitored by local police or fire departments. Early fire detection systems may give you enough time to get livestock out and maybe save the building.
- Trickle-charged battery powered emergency lighting to permit evacuation of people and animals in case of power failure.
- A water source on the premises, especially a pond will help the fire department to save buildings. Trucking in water from a distance if a water hydrant is not available is time consuming. Remember to have the water source properly fenced to keep unwanted visitors out.

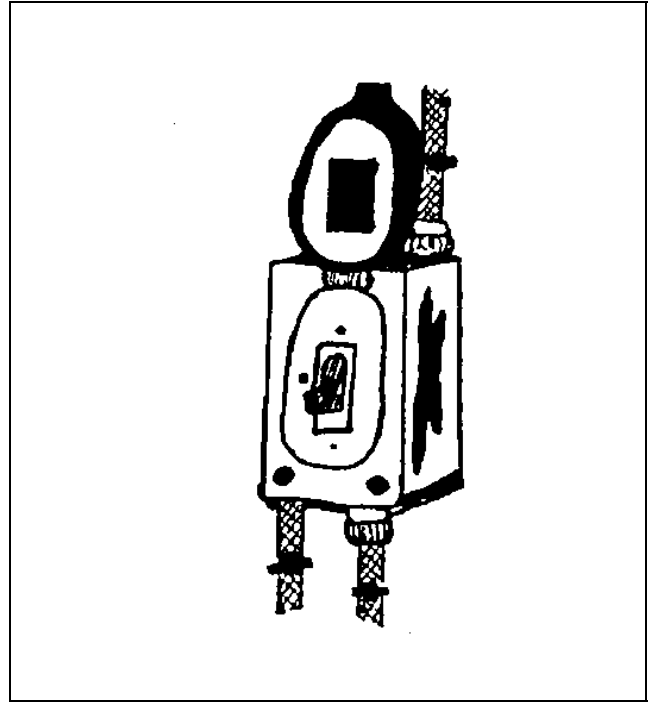


Figure 1. Switchbox, UF cable with dust and moisture-tight connections and cover.

ELECTRICAL SYSTEMS AND DEVICES

Electrical systems in barns, especially in older structures, is often the cause of a barn fire. The following safety precautions (sometimes beyond the township electrical code requirements) should be taken when installing a new system or repair of an older electrical system.

- Avoid areas of excessive moisture for the location of the main electrical panel box.
- Place panel box in the driest, most dust free area as possible. (Stall areas are not recommended; place in tack room or utility room.)
- Panel box should be corrosive resistant and weather-proofed even if installed inside a building.
- Outlets and switch boxes should be made of metal and have dust and water tight spring-loaded covers that close when released (See Figure 1).
- Wires should be encased in metal conduit pipe. Even temporary wires (such as extension cords to a tank heater) should be run through conduit pipe to keep the wires safe from breakage and away from the teeth of horses, livestock and rodents and metal

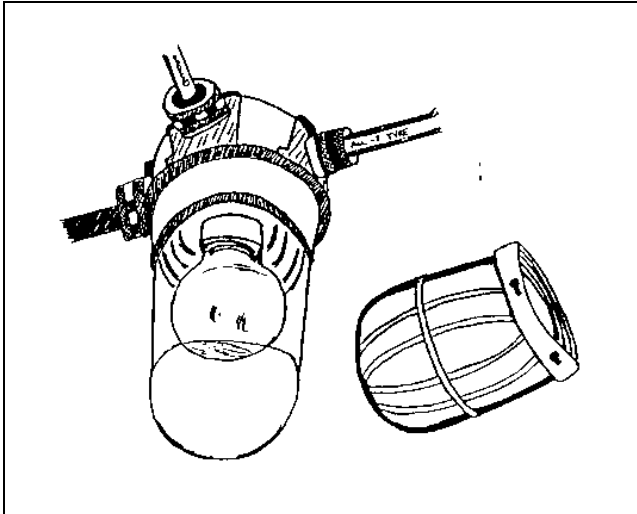


Figure 2. Light Fixture. Dust and moisture-tight globe and wire cage to protect globe.

shoes of horses.

- Light fixtures for fluorescent lights should have dust and moisture resistant covers. Incandescent bulbs should have globes with seals that are dust and moisture proof, surrounded by a globe cage to prevent accidental breakage (See Figure 2).

Below is a check list regarding other electrical concerns in animal facilities.

- Motors - such as the type used for circulation fans, water pumps or hay elevators should have moisture/dust proof on/off switches.
- Motors should not be within 18 inches of any combustible material (hay, bedding). A fire resistant shield should be placed around such material to protect it from any heat given off by a motor.
- Electric fence units can be potential fire hazards, especially if the units are of the continuous current type. Use only UL listed units that are of the solid state transistor-type, with intermittent current. Fence-line units should be 10 feet from buildings, enclosed in a weather-proof structure.
- Any appliances used in the barn (i.e. clippers, dryers, vacuums) should be UL approved and grounded. Appliances with broken, frayed cords or bent plugs should not be used until properly repaired. (Wrapping the cord in electrical tape is

not a proper method of repairing a frayed cord.) All appliances should be disconnected when not in use.

- Portable heaters should not be used in the barn area. If they are used in tack rooms, heater units should not be left unattended and turned off when you leave the room. Many of these heaters do not contain safety devices which prevent overheating.
- Do not place portable space heaters near live-stock where they may be knocked over. Make sure heaters have a shut-off device that activates if the unit is knocked over.
- Improperly utilized heat lamps are a major source of barn fires. They are often placed too close to hay and bedding which may ignite quite easily from the heat. Never use extension cords with heat lamps.
- Heat tapes and water tank heaters must have a thermostat and be UL listed. Tapes and tank heaters should be installed and used following manufacturer instructions. Tank heater cords and heat tapes should be adequately protected so that animals (horses, livestock, cats, dogs, rodents) cannot easily chew through them causing electrocution, electrical shocks or a barn fire. Heat tapes should be protected with a fire retardant insulation material.

GENERAL FIRE SAFETY PRECAUTIONS

- Smoking should never be permitted in any barn, hay/bedding storage area, tack room or lounge. No-Smoking signs should be posted in these areas and at all exterior entrances. Butt cans provided as an incentive to extinguish all cigarettes.
- Exit doors should be clearly marked.
- Aisles should be raked or swept clean of hay and bedding. Vacuum up cobwebs and dust regularly. Wipe dust/dirt off light fixtures, outlet covers, switches and panel boxes (see Figure 1).
- Weeds, twigs, and other trash should be kept mowed or picked up from around the outside of the barn.
- Manure piles should be at least 20 feet away from the barn to reduce the chance of combustion fire.
- Hay/bedding storage should not be near lights, fans, electrical boxes, heaters or outlets.

- When storing newly baled hay, care should be taken that the temperature of the bales does not get too hot. Adequate ventilation should be provided for additional drying of the hay. If too much heat builds up, spontaneous combustion is inevitable. (Never purchase hay that is hot - meaning that it was baled too wet. This is a fire hazard and the hay will usually turn moldy, making it unpalatable and unhealthy for horses to eat.)
 - Flammable substances should be kept elsewhere besides the barn.
 - Store vehicles and machinery in a separate building.
 - A halter and lead shank for each horse should be hung on all stall door fronts in case of an emergency.
 - A fire hose and buckets should be available and kept for this purpose only.
 - Practice fire drills should be held so employees and boarders are familiar with their responsibilities should a real fire occur.
 - A fire extinguisher should be hanging at all exterior doorways, in the middle of long aisles, and next to the electrical panel box.
 - Signs denoting placement of fire extinguisher should be highly visible.
- Remember, the barn can be a safe place for horses and/or livestock to live and for you to enjoy if you follow the above recommended fire safety procedures and precautions.

REFERENCES

1. *Basic Horse Safety Manual*. American Youth Horse Council in Cooperation with American Horse Council. 1989.
2. Extinguishing Fire Hazards. *Equus Magazine*, 162. April 1991.
3. *Fire Safety in Agricultural Buildings*. Reinsurance Association of Minnesota. 1983.

LIGHTNING PROTECTION

- Buildings should be equipped with professionally installed lightning rods of copper or aluminum. The system should be properly grounded.
- All pipes, water systems, electrical systems and telephone lines should also be grounded.
- Contact a professional company for proper maintenance and installation.

Fire Extinguisher

- ABC (all class) dry-chemical fire extinguisher should be in all livestock buildings, workshops or wherever welding is done.
- The extinguisher should be of 5 lb. minimum; 10 lb. is ideal.
- Even if a unit is only partially discharged, the extinguisher must be recharged.