Washington State Department of
Labor & Industries

# Electrocution Hazards in Agriculture

October, 2010

# Agriculture Electrocutions in the United States

Electrocution is quick and deadly and one of the most overlooked hazards of farm work.

- Each year 3.6% of the deaths among youths under 20 years of age are caused by electrocution.
- Every year 62 farm workers in the U.S. are electrocuted.

# Causes of Electrocutions in Agriculture

The most common causes are portable grain augers, oversized wagons, large combines, irrigation pipe and other tall equipment that contact overhead power lines.


# Equipment involved in electrocutions

Tractors with front end loaders

Portable grain augers

Irrigation pipes

# Other equipment involved in electrocutions

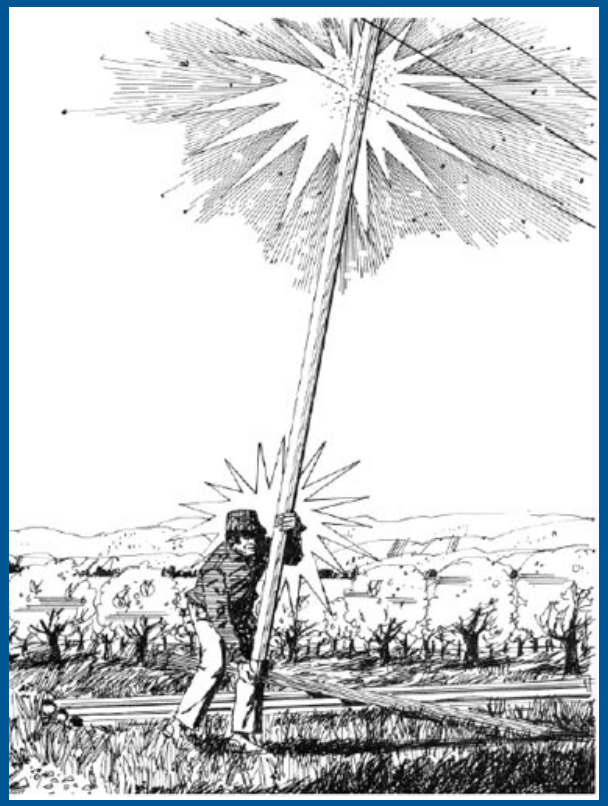
Fold-up cultivators

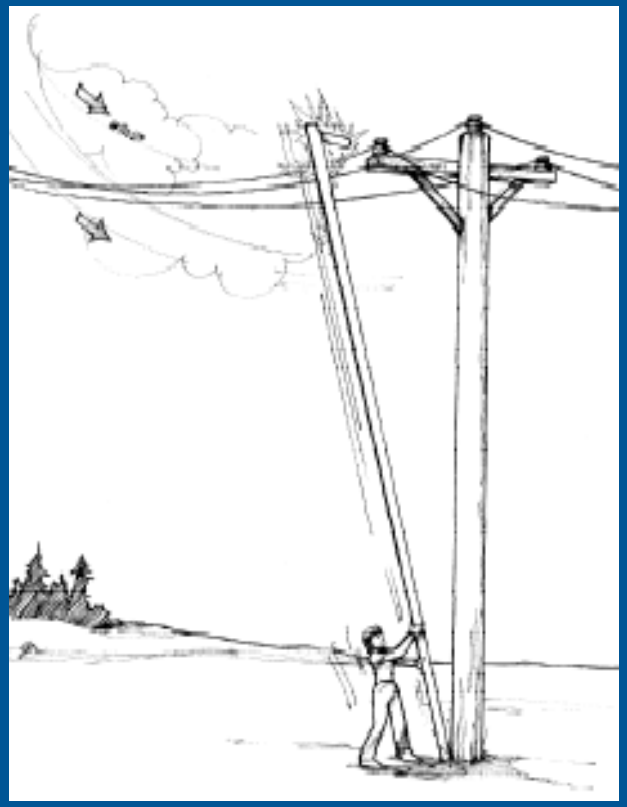
Combines

Other tall equipment

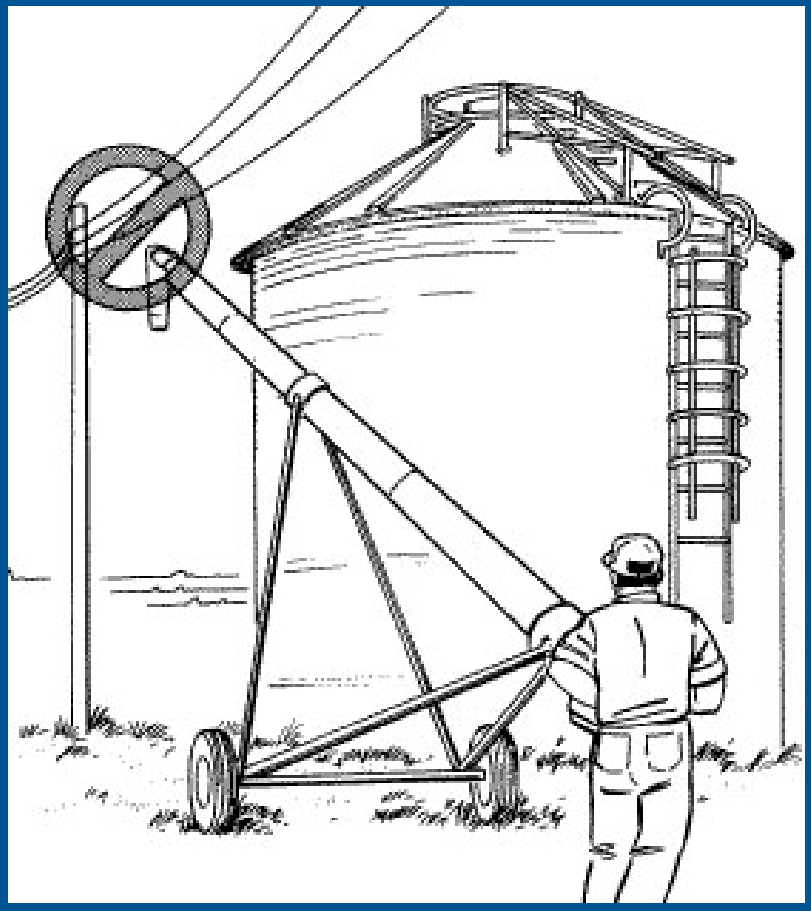
# Irrigation pipe hazard

Agriculture workers have been electrocuted when they lifted 30 ft. aluminum irrigation pipes to a horizontal position under high-voltage lines.





# Portable Grain Auger Hazard



Source: Illinois Cooperative Extension

If in the vicinity of power lines, always lower a portable grain auger before you allow anyone to move it, even just a few feet.

# DOSH Rules on Power lines

Irrigation pipe can't be stored within **100 feet** of overhead power lines.

100 ft.

Irrigation pipe can't be upended (turned vertical or upright) within 100 feet of overhead power lines.

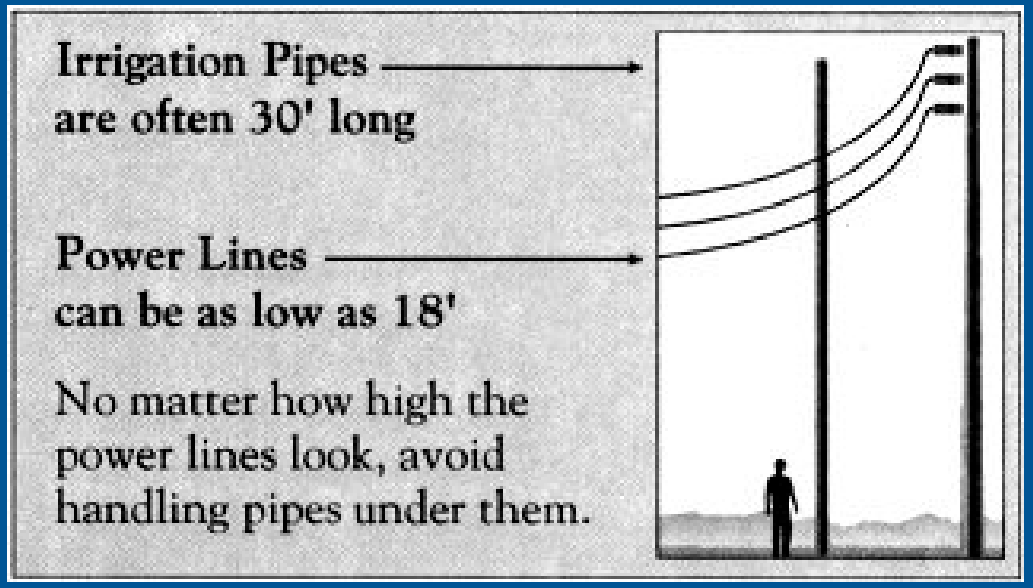
All equipment and irrigation water streams must be kept at least **10 feet** away from high-voltage power lines.

10 ft.

Agriculture rules on overhead power lines

# Prevention Tips – Power Lines

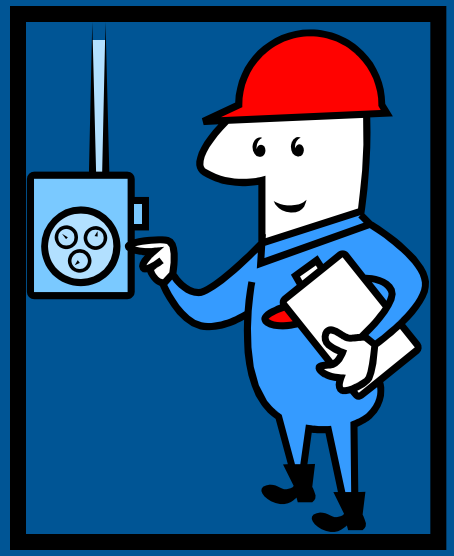
- Watch out for overhead electrical lines
- Know where they are located
- Treat all overhead power lines as though they can kill you
- Keep all tall equipment and irrigation pipes away from overhead lines

# What If Vehicle Contacts Power Line?

Know what to do if the vehicle you are operating comes in contact with an overhead line:

- Stay on the vehicle, unless there is a fire
- Ask for someone to immediately contact the local utility company to shut off the power.



# What If Vehicle Contacts Line? (Cont.)

- Electrical current from high voltage lines can flow through vehicle and energize the ground up to 100 feet away.
- If there is an emergency such as an electrical fire and you must leave the equipment, jump as far away as possible.
- Do not allow any part of your body to touch the equipment and the ground at the same time.

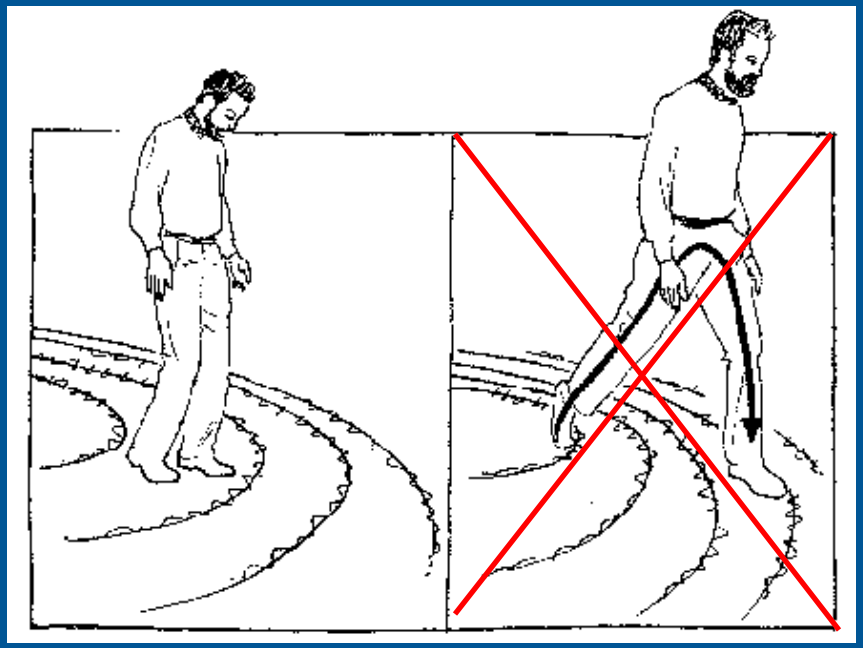



Source: Ireland Health & Safety Authority

# What If Vehicle Contacts Line? (Cont.)

Shuffle away from where you jumped. To shuffle, do not lift either foot completely off the ground. Keep both feet in contact with the ground at all times.

Shuffling greatly reduces current flow through your body from the ground. Shuffle slowly away from the equipment for at least 100 feet.



Shuffle, don’t step

# What If Vehicle Contacts Line? (Cont.)

Once away from the vehicle, never attempt to get back on or even touch it.

Many electrocutions occur when someone dismounts, then gets back on the vehicle, assuming there is no problem.

# Transport and Clearance

Determine transport and clearance height for farm equipment. Ask the utility company to do this. Never measure line heights yourself.

Where possible, use pre-planned routes that avoid power lines when moving equipment

Keep all equipment and objects at least 10 feet away from overhead power lines.

# Warning Signs

On farm equipment that has parts capable of vertical, lateral or swing motion, install a durable sign, legible at 12 feet that says:

**Unlawful to operate this equipment
within 10 feet of
high voltage lines.**

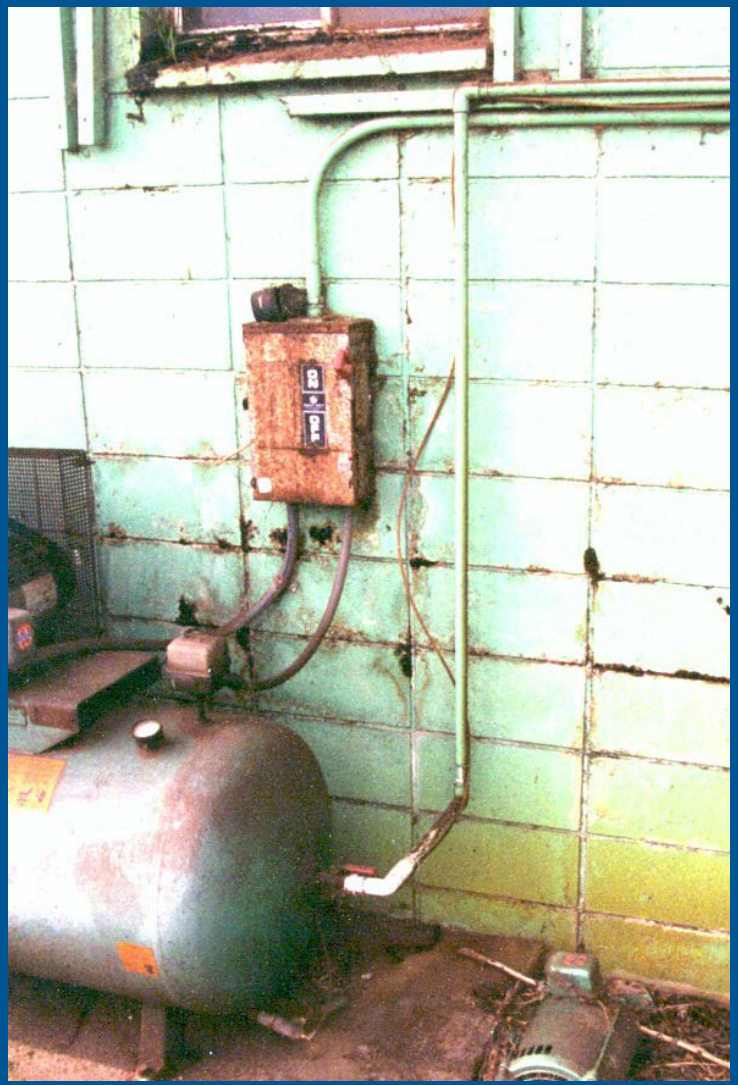
# Special Concerns –Barns & Livestock Houses

- Barns & livestock houses are dusty, moist and corrosive places.

- Supply waterproof, dustproof, and explosion proof electrical boxes, outlets and motors in these areas to ensure safe and reliable electricity throughout the farm.

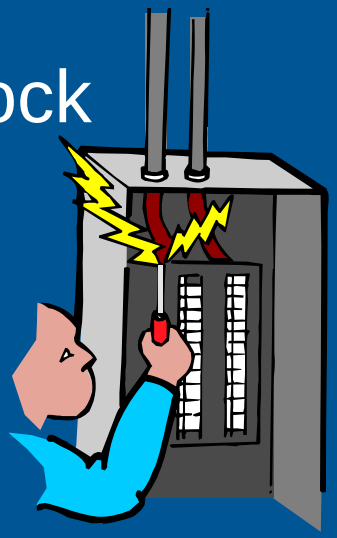
# Special Concerns –Barns & Livestock Houses

This shows what can happen when electrical boxes are exposed to moist and corrosive environments.

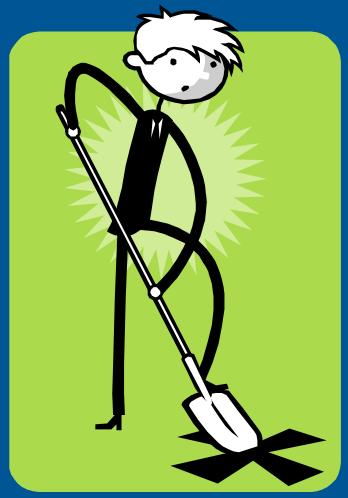


# Determine  Other Electrocution Risks

Determine risks for potential electrical shock and restrict access to those areas.



Locate all buried lines and keep the information available for reference before any digging operations.



# Train Your Workers

- Provide adequate training for all workers. Train them in rescue and emergency procedures so everyone in your operation knows what to do in an electrical emergency.
- Train seasonal workers about dangers and give additional reminders.

**Effect of electric current on humans.**

| | Milliampere | Effects |
|---|---|---|
| SAFE | Less than 1 | No sensation, not felt. |
| | 1 to 8 | Shock sensation; not painful; can let go at will. |
| UNSAFE | 8 to 15 | Painful shock; can let go at will. |
| | 15 to 20 | Painful shock; loss of adjacent muscle control; can not let go. |
| | 20 to 50 | Painful, severe muscular contractions; difficulty breathing. |
| | 50 to 100 | Possible ventricular fibrillation. |
| | 100 to 200 | Certain ventricular fibrillation. |
| | More than 200 | Severe burns; severe muscular contractions; chest muscles clamp heart and stop it for the duration of shock. |

One milliampere (mA) is 1/1000th of an ampere (current). Ventricular fibrillation is a breakdown of the pumping coordination of heart muscles that will not correct itself. This information applies to adults. Weaker currents could be fatal to children. Information taken from the National Safety Council.

Source: Texas cooperative extension

# Safety Decals

If not already labeled, attach decals to all equipment that may pose electrical hazards and explain decals to workers who work with the equipment.




# Links to More Information

Agriculture rules on overhead power lines

Preventing Electrical Shock – Texas Cooperative Extension

Grant County PUD – Farm Safety

Request assistance from Labor and Industries:
www.lni.wa.gov/Safety/Basics/Assistance/Consultation/default.asp

Also, contact your local power company for more information on electrical safety.