

# Take Special Care On the Farm

## *Paying attention to electrical safety is critical to preventing electrocution among farmworkers*

**E**ach year, farmworkers are electrocuted when large machinery makes contact with overhead power lines.

Tragedy can be avoided by paying attention to the special electric risks faced by farmers.

### **Wiring Agricultural Facilities**

A special problem with electricity on the farm is the dusty, moist and corrosive environments of most livestock houses. Waterproof, dustproof and even explosion proof electrical boxes, outlets and motors are available for use in livestock facilities.

Type NMC or UF cable is recommended for most situations. These materials ensure safe and reliable use of electricity throughout your farm.

The gauge of the cable needed for a specific circuit branch varies with the length of run and the demand of the power equipment to be connected. Check with a qualified electrician before purchasing cable to connect a branch circuit.

### **Protecting Electric Cable**

Encasing electric cable inside conduit provides extra protection from livestock and gnawing rodents.

There are two basic types of conduit: metal and PVC (plastic). PVC is preferred inside agricultural structures because it is not corroded by moisture and is generally less expensive than metal conduit.

Both metal and PVC conduit can be sealed where it joins receptacles and junction boxes, reducing moisture concerns.

All electric cable in an agricultural structure, whether encased

in conduit or not, should be placed in open areas for frequent inspection and maintenance. Keep electrical switches and wires out of the reach of livestock.

### **Extension Cords**

For agricultural use, purchase extension cords with a strong outer coating.

Type "S" hard service cords have the strongest outer covering. Don't be confused with other "S" ratings, such as Type SJ—the "J" stands for junior hard service cord—which should not be used outdoors.

Extension cords are sold in various cable sizes. Smaller numbers indicate larger wire size. No. 10 wire is larger than No. 14.

### **Consider Ground-Fault Circuit Interrupters (GFCI)**

A ground-fault circuit interrupter (GFCI) is a circuit breaker designed to prevent serious shock to people or animals under certain conditions.

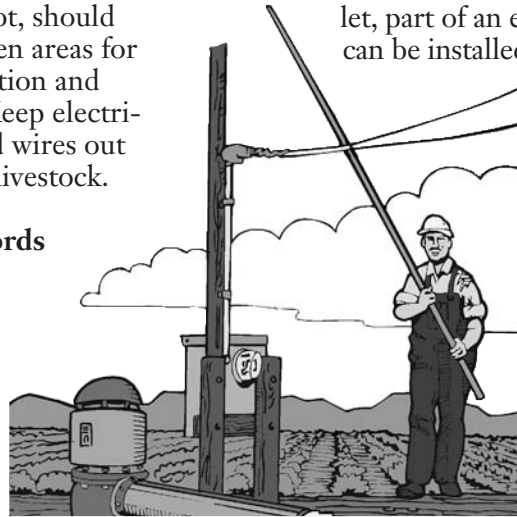
It can reduce the risk of shock when using electrical tools or appliances in damp or wet areas.

A GFCI works on the principle that the two wires supplying a single-phase electrical load must carry the same number of amperes.

If a ground-fault occurs, either to the grounding wire or through a person or animal, some of the current will take an alternate route back to the system's grounding electrode. One of the wires will then carry less current than the other wire.

When this occurs, the GFCI breaks the circuit, stopping the flow of electricity, thereby reducing the electric shock hazard.

Ground-fault circuit interrupters come in several styles. They are commonly used as a receptacle out-



let, part of an extension cord, or can be installed in the main electrical panel to replace an existing circuit breaker.

When installed as a circuit breaker, the GFCI offers shock protection to an entire electrical branch.

A portable GFCI is recommended

for use with power tools in damp or wet locations. The portable GFCI is plugged into an outlet and the power tool is plugged into the GFCI.

Certain conditions can result in "nuisance tripping" of a GFCI protected circuit or receptacle.

While installing a GFCI to prevent electrical shock from farm equipment seems like a good idea, nuisance tripping may become a serious problem. The loss of a ventilation system in certain livestock facilities can be fatal to animals if the GFCI trips, and stock waterers may freeze if the GFCI trips.

Carefully consider the effects of loss of power to an agricultural circuit before installing GFCI protection. The most effective shock prevention system for agricultural equipment and circuits is a good equipment grounding conductor run with the circuit wires and connected to all metal agricultural equipment.

### **Teach and Practice Safety**

Even with the right installations, tragedy can result due to carelessness and lack of knowledge.

Each day, review with all workers the activities and work practices that take place around power lines.

Know the location of power lines, and keep farm equipment at

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least 10 feet away from them.

Use care when raising augers or the bed of a grain truck. It can be difficult to estimate distance and sometimes a power line is closer than it looks. When moving large equipment or high loads near a power line, always use a spotter or someone to help make certain contact is not made with a line.

Always lower portable augers or elevators to their lowest possible level before moving or transporting them. Be aware of increased height when loading and transporting larger modern tractors, which often have higher antennas.

Never attempt to raise or move a power line to clear a path.

Be careful of bumping into the guy wires on electrical poles. This will cause sagging in the overhead lines and will make entanglement more likely. Always stay alert and never take unnecessary risks.

As in any outdoor work, be careful not to raise equipment such as ladders, poles, irrigation pipe or rods into power lines. Even nonmetallic materials such as lumber, tree limbs, tires, ropes and hay will conduct electricity depending on dampness, dust and dirt contamination.

Be extra careful when working around trees and brush, which often obstruct power lines.

When planning new construction, consider existing power lines.

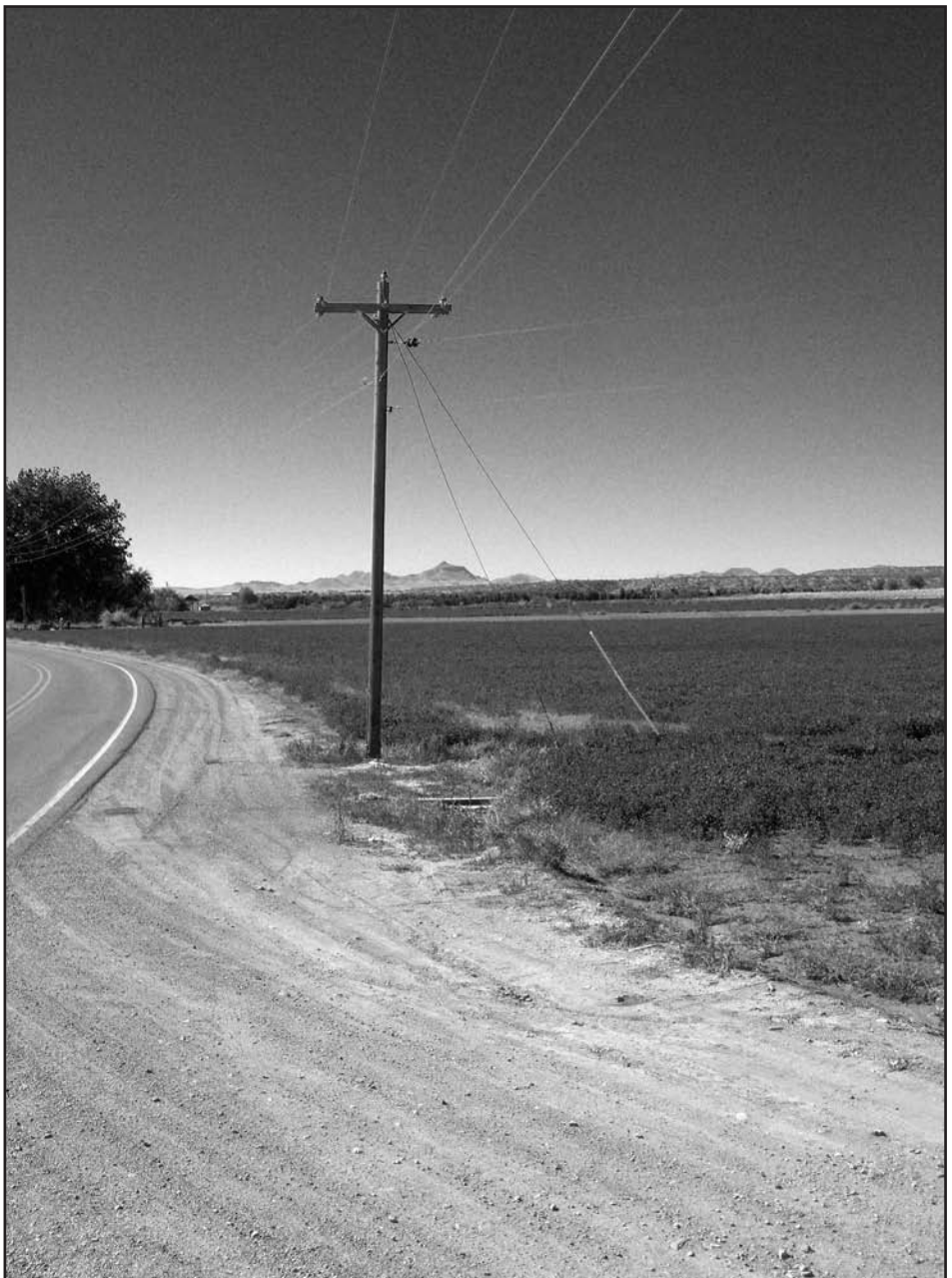
Use qualified electricians for work on drying equipment and other farm electrical systems.

### **Know What to Do If Contact Is Made With a Power Line**

Teach farm equipment operators what to do if the vehicle comes in contact with a power line.

"It's almost always best to stay in the cab and call for help," says Molly Hall, executive director of Safe Electricity. "Warn others who may be nearby to stay away and wait until the electric utility arrives to make sure power to the line is cut off."

If the power line is energized and you step outside, your body



*When working on farmland near power lines, be sure to look up. Photo by Steve Lunt.*

becomes the path and electrocution is the result, notes Bob Aherin, an agricultural safety specialist with the University of Illinois.

"Stay inside the vehicle unless there's fire or imminent risk of fire," he says.

In that case, the proper action is to jump—not step—with both feet hitting the ground at the same time. Do not allow any part of your body to touch the equipment and the ground at the same time.

Continue to hop or shuffle to safety, keeping both feet together as you leave the area.

Once you get away from the equipment, never attempt to get back on or even touch the equipment. Many electrocutions occur when the operator dismounts and, realizing nothing has happened, tries to get back on the equipment.

"These accidents are preventable if proper safety procedures are followed," Aherin says. ■

*Information courtesy of Safe Electricity, an electrical safety public awareness program created and supported by a coalition of organizations, including electric cooperatives.*