

## *Farm Safety Series*

# Safe Tractor Operations

## Statistics

- Annual death rates for farming operations are 20.3 per 100,000 farm workers nationally.
- Average Alabama death rates are 8 to 10 per year.
- 36 percent of all agricultural fatalities nationally involved a tractor in 1997.
- 10 percent of all national fatalities involved other machinery (farm implements used with tractors).
- Don't become a statistic. We need and appreciate all of our Alabama farmers.

## Foundations of Tractor Safety

### The Tractor Operator

It is management's responsibility in selecting, training, motivating, and supervising tractor operators. The Alabama Cooperative Extension System will provide training for tractor operators in safe use of equipment. This publication can be used to help with that responsibility.

### A Safer Tractor

Modern tractors are safer than those of 20 to 30 years ago. Rollover protection systems (ROPS), seat belts, improved hitch design, improved shielding of power take-offs (PTOs), improved brakes, wider wheel bases, better visibility, running lights, and adjustable seats are improvements that have led to safer tractors. However, a few modern features have actually increased potential danger. Increased rear axle torque increases the risk of rear overturns, and faster tractors increase the danger of side overturns and losing control during roadway travel.

### Rollover Protection Structures

Nearly one half of the tractor-related deaths are due to tractor overturns. The side overturn is the most frequent type, accounting for 75 to 85 percent of overturns. The second type is to the rear. Without a ROPS, 85 percent of rear overturns result in the operator's death. Rear overturns occur when the tractor can't move forward, and the rear axle torque causes the tractor to pivot around the rear axle. The entire event can happen in as little as 1.5 seconds. The tractor can reach the point of no return in as little as 0.75 second. Some causes of rear overturn are pulling a load uphill, being stuck

in the mud, or pulling a load that has been hitched above the draw-bar. Always use the seat belt with tractors equipped with ROPS, and never use one when the tractor is not equipped with ROPS. Tractors are prone to side overturns because of the high center of gravity; sharp turns and high loads can cause it to overturn quite easily and at relatively slow speeds. Centrifugal force can cause a tractor to overturn if the direction of travel is changed abruptly. For example, when a tractor's front wheel veers into the road ditch, the natural reaction of the operator is to quickly steer it back onto the roadway; however, the forces can easily pull the tractor over on its side.

### Important Points

Tractor overturns are the leading cause of work-related deaths in agriculture.

The use of ROPS and the seatbelt is 99 percent effective in preventing deaths and injuries from overturns.

### A Safer Environment

Inspect the environment in which tractors will be used. Identify hazards and take action to eliminate them. Stay at a 1:1 ratio away from ditches with respect to the depth of the ditch or canal. For example, if the ditch is 12 feet deep, stay 12 feet from the edge of the ditch. Avoid sharp, blind corners or curves and rough or slippery surfaces. Eliminate tree limbs and vegetation that pose a threat to safe use patterns of tractors. If travel on a public road is necessary, travel when traffic is at a minimum and visibility is good. Be aware of overhead power lines, especially when towing equipment that may have high points such as boom sprayers.

Never allow anyone to ride on the tractor except the operator. Riders are easily thrown from the tractor and run over by the tractor or implements that it is pulling. Extra riders are an unnecessary risk never worth taking.

**Road safety**—The most common roadway collisions are the left-turn collision and rear-end collision. The left-turn collision occurs because the tractor operator is attempting to turn left as a motorist is passing. Extension mirrors installed on tractors will greatly help avoid this accident. Rear-end collisions occur because the motorist doesn't see the tractor

in time. Slow-moving vehicles are difficult to judge approaching speed. In most cases, there are only a few seconds to react to slow-moving vehicles to avoid a collision. For example, if a motorist is driving 55 miles per hour and comes upon a tractor moving 15 miles per hour, it only takes 5 seconds to close a gap the length of a football field. Always use the triangle symbol on the rear of the tractor, indicating a slow-moving vehicle. Make sure that the symbol is visible to rear-approaching traffic, is not faded or covered with dust or mud, and one point of the triangle is pointing upward. All lighting for self-propelled equipment must be in good operating condition and used during day or night transport. Consult the ASAE standard S279.11 for proper placement and brightness of lighting equipment and reflective material on both self-propelled and non-self-propelled equipment. It is listed on the [www.asae.org](http://www.asae.org) Web site.

### Miscellaneous Topics

- Maneuvering and turning on short radius and entering roadways—Slow down for short radius turns and always look in both directions before entering a public highway. Even when turning right onto a highway, you may cross the lane centerline and be in the oncoming traffic lane. Wait until the way is clear in both directions before entering a highway.

- Using the highway shoulder for transport—Avoid transporting tractors using the shoulder of the roadway, particularly if obstructions, such as mailboxes and highway signs, require re-entering the highway. Motorists attempting to pass as you re-enter the roadway may result in an accident. If you need to allow traffic to pass, pull over on the shoulder and stop. Wait until the way is clear in both directions before re-entering the highway.

- Hazards of filling gas cans—Use only OSHA-approved gas cans. Place containers on the ground or pavement, and keep the gas pump nozzle in contact with the can while filling it to avoid an electrostatic charge, which can develop from vinyl or plastic bed liners. Don't smoke while filling and tie cans in place while transporting them.

- Maneuvering over steep slopes—The proper way to handle steep slopes is to back up slopes and drive forward down the other side. Operating across slopes requires the widest wheel adjustment, slow speeds, and extra caution in watching for obstacles that the tires may hit. Turn the front wheels downhill at the first indication that the tractor is becoming unstable.

- What to do when the tractor gets stuck—Try backing out first. Driving forward is dangerous and can result in a rear overturn. If towing is necessary, you should be towed forward by hitching to the tractor frame. If the tractor must be towed backward, hitch only to the draw-bar. When towing, only use chain or steel cable and tighten it slowly. Nylon rope or strap should never be used as it can break and snap back, resulting in injury or death by throwing the cable hook through the cab or window. The tractor operator doing the pulling in towing operations is subject to the most risk, because a rear overturn could occur.



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For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

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