

Agricultural Tractor Safety

Operation of agricultural tractors is one of the most hazardous activities farmers and agricultural workers can undertake. Common incidents may include roll-overs, run-overs, or unintended contact with tractor attachments, implements, and power take-off (PTO) systems. This fact sheet provides information about these tractor hazards, along with safety measures to protect tractor operators and those working near tractors.

General Safety Precautions

- Ensure operator and workers are thoroughly familiar with farm machinery even if they are used for only a few days out of the year.
- Conduct preoperational safety checks, review proper operating procedures and ensure that tractor safety decals and stickers are not worn, damaged, or removed.
- Ensure that operators are familiar with the ground where the tractor will be used. They should be aware of any ditches, uneven ground, and bystanders that may be in the area.
- Prevent indoor carbon monoxide (CO) buildup by ensuring that adequate ventilation is always available when starting or operating tractors indoors.
- Tractors operating near public roadways must have a clean, highly visible, slow-moving vehicle (SVM) sign affixed to the rear of any tractor and its towed attachment traveling 25 mph or slow.
- Prevent exposure to chemicals such as pesticides and anhydrous ammonia.

Roll-overs

Tractor roll-overs are the leading cause of fatalities in the agriculture industry, resulting in approximately 130 deaths per year. Tractor roll-overs occur when the tractor turn on their side or tip over backward. Roll-overs occur very quickly and don't give the operator time to react and get clear as the tractor tips or rolls.

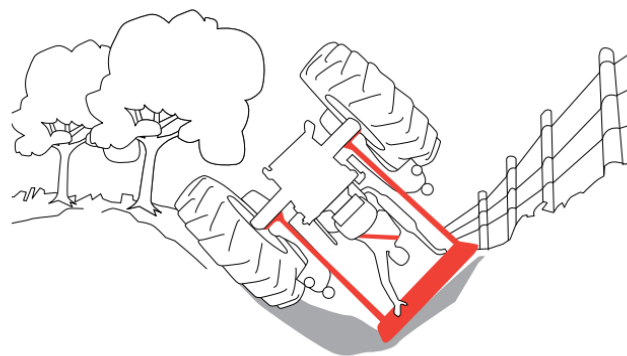
In general, tractors are safe when operated properly. Tractors that are in poor condition, old, lack safety guards and devices, or are driven in a risky manner can greatly contribute to unsafe or hazardous conditions.

Roll-over Protective Structures (ROPS)

A tractor equipped with a proper ROPS system and seat belt greatly increase the survival of the operator in the event of an overturn. A ROPS is a cage frame or a roll bar that is designed to form a zone of protection around the operator if a tractor rolls over. To prevent being thrown from a tractor, operators must wear a seat belt.

ROPS and Seatbelt Requirements

- Agricultural tractors with over 20 horsepower manufactured after October 25, 1976 are required to have ROPS.
- Each tractor with a ROPS must have a seat belt
- Operators must wear and use a seat belt properly
- ROPS and seatbelts must be inspected for damage before tractor use



A roll-over protective structure and a seat belt can protect workers from being crushed by an overturned tractor.

Source: [OSHA Publication 3835](#)

Tractor Operator Training

All university personnel operating an agricultural tractor must receive annual Health, Safety, and Risk Management (HSRM) training on the safe operation of agricultural tractors and associated equipment. In addition, hands-on operator proficiency must be evaluated and documented by a supervisor prior to operational of an agricultural tractor. Operator proficiency must be tested upon initial assignment or when assigned to new equipment and annually thereafter.

Further guidance on training requirements can be found in the [HSRM Agricultural Safety Program](#).

Power Take-Off (PTO) Shafts

A PTO allows agricultural workers to use power from the tractor's engine to drive a variety of machines and implements. PTOs are useful but can pose a serious safety hazard.

The following safe operating practices must be followed:

- All PTOs, including rear, mid- or side-mounted shafts must be guarded by a master shield or other protective guarding.
- Prior to servicing, adjusting, cleaning, or unclogging the equipment, stop the engine, disconnect the power source, and wait for the PTO shaft to stop.
- Keep all guards in place when the machine is in operation.
- Ensure personnel nearby are clear of the machine before starting the tractor's engine and engaging the PTO shaft's selector switch.
- Tie back long hair and do not wear loose clothing.

Avoid working alone around PTO-driven machinery. If entanglement occurs, a coworker may be able to stop the PTO shaft in time to prevent a more serious injury, or death.

Transporting Tractors

When agricultural tractors are transported on a trailer, it must be secured from displacement by adhering to the following requirements:

- Tow vehicle and trailer must be properly rated for the weight of the tractor and any additional materials.
- Lower and secure to the trailer all accessory equipment (hydraulic shovels, booms, etc.).
- Restrain articulated vehicles to prevent articulation while in transit.
- Set the parking brake on the equipment being transported.
- The sum of the working load limits from all tie downs must be at least 50% of the weight of the cargo.
- Attach tie downs at the front and rear of the vehicle or at the mounting points on the vehicle designed for that purpose.

Questions

If you have questions on this topic, please contact Health, Safety, and Risk Management at (612)626-6002 or email us at hsrm@umn.edu.