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# General tractor safety

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## Quick Facts

Tractors today are safer than ever, but are still involved in many farm accidents (2,566 reported deaths during 1975-81). Overturns are the major cause of tractor-related deaths.

A seat belt and a roll-over protection structure (ROPS) could prevent most overturn deaths.

Safe tractor operations guidelines include proper servicing, fuel storage and refueling practices, correct speeds, not carrying passengers, proper hitching of implements, turning off engine and/or power take-off when not in use and keeping all shields and guards in place.

Colorado State University conducted a study of Colorado agriculture-related deaths from 1978 to 1982. The study showed 37.5 percent of the deaths were tractor related. Of these 30 tractor related deaths reported, 16 or more than 50 percent were caused by tractor overturns. Again, simply utilizing a seat belt and a roll-over protection structure could have prevented these deaths.

## Guidelines for Safe Tractor Operations

1. Be sure tractor is properly serviced. Check lubrication, fuel and water. It is best to check the radiator level when the tractor is cold. If you must check it when hot, use extreme care.

2. Never refuel your tractor while the engine is running. Static electricity, a spark from the ignition system, or a hot exhaust could cause the fuel to ignite. Grounding out the tractor by use of a ground wire or by dropping mounted equipment so it contacts the ground can reduce the static electricity problem.

3. Always fuel your tractor outside and store your fuel outside. It's best to have fuel storage at least 40 feet from any building. Keep the area free of weeds or any other burnable material.

4. Carry a first aid kit and approved dry chemical extinguisher. Tractors should have at least a five-pound extinguisher.

5. Be sure of good ventilation before starting the tractor engine. Exhaust gases contain carbon monoxide, which is odorless, colorless and deadly.

6. Keep small children away from tractors. Tractors are designed to carry only one person—the driver. Each year small children are killed as a result of falling from the tractor. The chances of children being killed are just as great when they are allowed to ride on trailing equipment.

7. Keep wheels spread wide whenever possible. A tractor will overturn sideways much easier if the wheels are close together. When wheels must be moved in for narrow row farming, operators should use extra precaution, especially when traveling at higher speeds on roads.

Although today's tractors are the safest ever, they are still involved in many farm accidents. Seatbelts, power take-off (PTO) shields, traveling lights and automatic hydraulic oil shut-off are standard on most new tractors. Roll-over protective structures (ROPS), still not standard on all new tractors, are very effective in preventing fatalities during tractor roll-over.

The Occupational Safety and Health Administration (OSHA) requires that employers provide employees with:

- a standard roll-over protection structure,
- a standard seat belt,
- protection from tractor fluid spillage, and
- protection from sharp surfaces.

A study conducted at Johns Hopkins University in Maryland categorized tractor-related deaths during 1975-81. Of the 2,566 reported deaths, 45 percent, or 1,163, were caused by tractor overturns. A breakdown of causes of tractor related deaths in this seven-year study is shown in Table 1. A roll bar or protective cabin could have prevented almost all of these deaths.

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8. Reduce speed before turning. Doubling the speed of a farm tractor increases the danger of upsetting sideways four times. Centrifugal force tries to keep the tractor in a straight line. If you try to turn at a high rate of speed, the tractor will attempt to go straight rather than turn.

9. Reduce speed when using a loader. A loader in the raised position can increase the possibilities of overturns. Keep the loader as close to the ground as possible. Be alert for ditches, rocks or holes that might cause the tractor to overturn. The center of gravity can be affected if the load is kept too high in the air.

10. Stop the engine before getting off the tractor. Operators can be killed by a tractor when the tractor has been left running with the operator off the seat, leaving when it has been put in gear, parked, or had the brakes locked.

11. Never hitch to the axle or other high point. Always hitch to the drawbar, slowly take up slack and never jerk on chains or cables. Broken parts of a chain can act like shrapnel, and a cable can cut the legs from under a person. Nylon ropes have killed tractor operators and bystanders when the rope broke away from an implement. The stored energy in the rope catapults the rope end into the victim. Tractors also can upset backwards when pushing, using a front end loader, or when hitched to the front end by chains or cables that pass under the back axle. Keep the hitch as low as possible, preferably 17 inches. Never get above 21 inches.

12. Be extremely careful when driving up an incline. A tractor can upset if the center of gravity moves behind where the rear wheels are in contact with the ground. Try and back up if it's necessary to get up the incline. If you get caught on a steep incline, back down very slowly and apply the brakes lightly. Weight on the front of the tractor will help.

13. Disengage the power take-off when it's not in use. Use the power shield whenever equipment is in use. If you do not have a PTO shield, make one—it may save your life.

14. Do not wear loose clothing while operating a tractor. Loose clothing can catch on moving parts causing an accident.

15. Keep the tractor in gear when going down hill. This allows the tractor engine to serve as a brake. In Nebraska it's unlawful to coast down a hill with the vehicle out of gear. Some tractors may have "free wheeling" in their transmission drive. Make sure this type of transmission is put in direct drive before attempting to use the engine as a brake.

16. Engage the clutch gently, especially when going uphill. 'Jackrabbit' starts are dangerous to both the operator and the tractor.

17. Never attach a post or log to the rear wheels when the tractor is stuck in the mud. If the wheels are not free to turn, the tractor can pivot around the axle and upset. Try to back out. If this does not work, get another tractor to pull you out.

18. The tractor operator must follow all traffic rules on open roads. This includes proper lighting, hand signals, right-of-way, etc. Tractors are restricted from using interstate highways.

19. Do not use a tractor for a job it wasn't designed to do. The tractor was designed as a source of power to do field work. It was not designed for chasing cattle, drag racing, or transportation to and from town.

**Safety rules when using tractor attachments:**

- Keep all shields and guards in place. Do not operate equipment with missing shields or guards.
- Shut off engine and be sure implement motion has stopped before performing adjustments or maintenance.
- For some attachments, use counterweight for stability.
- Lift rear-mounted attachments and drive slowly when making sharp turns.
- Raise and lower attachments slowly and smoothly.

**Table 1: Tractor related deaths.**

Cause	Overturn	Falls	Run over	Crushed	PTO*	Other	Total
Number	1155	333	308	257	128	385	2566
Percent	45	13	12	10	5	15	100

\*entanglement