



CANFARMSAFE™

002-6

Physics of a Tractor Rollover *How ROPS Can Keep You Safe!*

The use of tractors on the farm and in agriculture is the most hazardous activity that farmers regularly participate in. In fact, tractor rollovers are the leading cause of accidental death among farmers.

BUT WHY ARE TRACTORS SO DANGEROUS?



TRACTORS HAVE A HIGH CENTRE OF GRAVITY!

You can think of the centre of gravity of a tractor as being more like that of an SUV than a car which is what makes both SUVs and tractors more prone to rollovers.

- High centre of gravity means tractors are more unstable than other vehicles or equipment
- Large rear wheels contribute to high centre of gravity
- Addition of loads to tractors such as loaded bucket or mounted liquid fertilizer tank can create additional instability to a tractor

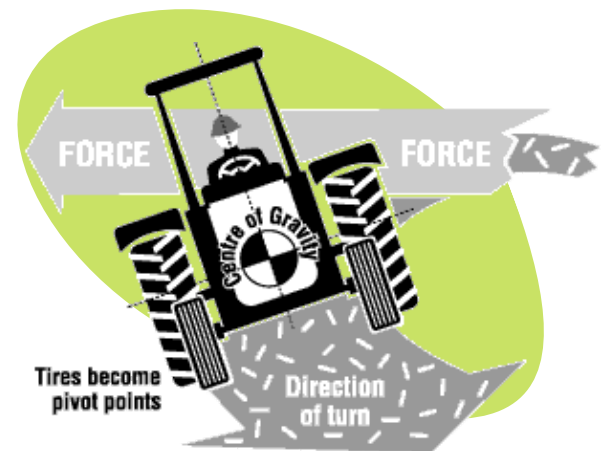


Image: Canadian Centre for Occupational Health and Safety (CCOHS)
https://www.ccohs.ca/oshanswers/safety_haz/tractors/stability.html?_undefined&wbdisable=true

4X

When tractor speed is doubled, the danger of a rollover increases by four times!

99%

ROPS plus seatbelts are 99% effective at preventing fatalities from a tractor rollover!



Sideways rollovers are the most common and can be caused by:

- Driving too close to an incline or embankment
- Driving too fast when negotiating a curve
- Driving a tractor with a loaded front-end bucket in the raised position
- Uneven braking at high speeds
- Loss of control due to excess weight of load

When operating a tractor make sure to keep in mind the higher centre of gravity and make sure you analyze the terrain you are travelling on for potential hazards.



Image: National Ag Safety Database (NASD)
<https://nasdonline.org/1650/d001534/a-guide-to-safe-farm-tractor-operation.html>

How Can Injury & Fatalities from Tractor Rollovers Be Prevented?

ROPS! Rollover protective structures or ROPS is a cab or frame designed to withstand the forces of a tractor rolling over in order to protect the operator. It is designed to keep the tractor operator within a “zone of protection” in the event of a rollover. This reduces the risk of the operator being crushed under the tractor. ROPS are designed to limit a tractor overturn to 90°. In the event of a rollover, a ROPS paired with seatbelts will reduce the chance of fatality rollover by 99%!

The Roll Out of Low-Cost Farmer Built ROPS into National Program project is working on continuing to design and develop blueprints for ROPS for older model tractors that can be built on the farm and retrofitted on tractors that do not have ROPS. The design of these ROPS is such that the stress of the structure is not on the welds sites which means that even those without journey-person welding skills are able to build their own structurally sound ROPS. The goal is to have the ROPS blueprints available through a ROPS Canada website and to have a certification process in place where engineers are able to attest to the quality of the ROPS constructed and supply an occupational health and safety compliance certification sticker.