

# MICHIGAN



## MICHIGAN STATE UNIVERSITY: Prevention of work-related deaths through research & investigation

### INVESTIGATION/RESEARCH: Safe Use of Tractors Will Prevent Work-Related Deaths

Tractors are commonly used in farming but are also frequently used in other industries such as construction and landscaping. Since 2001, there have been 110 tractor-related deaths in Michigan; 93 % of the deaths occurred in agriculture. There were ten tractor-related deaths in Michigan in 2015.



### CASE NARRATIVES

- A farmer died when he was pinned under an overturned Case International 585 loader tractor. The decedent had been operating the tractor in a wet, muddy field. He had been operating the tractor with the left side tires in the field area and the right side tires in the grassy area of a wooded tree line. The tractor came to a washout at the top of a drainage ditch. Tire tracks showed the tractor went off of the edge and into the drainage ditch and then overturned. The tractor was not equipped with rollover - protection.
- A farmer died when he fell off of his Ford 5600 series tractor and the tractor ran over him. The decedent was driving the tractor on a two lane roadway entered an extremely deep, steeply sloped ditch. When the tractor entered the ditch, the decedent fell off of the tractor and was run over. The tractor was not equipped with rollover protection.
- A farmer died while attempting to climb onto an Allis Chalmers tractor. The police report indicated "the tractor went into gear" and started moving backward in reverse. The decedent was unable to get onto the tractor and was dragged and pinned between a tree and the 3-point hitch on the tractor.
- A dairy farmer died when his jacket caught on the tractor causing him to fall from the tractor and be run over by the tractor tire.
- A man was clearing tree tops out of shooting lanes in preparation for rifle season at an outdoor rifle range. He was trying to pull a large tree out of the shooting lane by hooking a chain to the top of the tree. While pulling the tree, the Ford tractor (year 1963 or 1964) he was driving overturned to the rear. The decedent was pinned between the tractor seat and the ground. The tractor was not equipped with rollover protection.
- A farmer was crushed under his tractor's tire. The decedent started his tractor while standing on the ground. The tractor was in gear and rolled forward, running him over.
- A farmer died from exposure to carbon monoxide while working on his tractor in a closed garage.
- A farmer died when his chest and head were crushed by a tractor, which fell on him as he worked under it.
- A student died when the Ford 801 Powermaster tractor she was using to pull out a stuck tractor overturned to the rear, pinning her. A family member attached a chain to the rear of the Ford tractor to the front of the stuck tractor. The family member witnessed the front of the Ford tractor raise off the ground and overturn to the rear.
- A self-employed man working in the excavation industry died when a wooden post fell on him while operating his tractor in a farm field.

### RECOMMENDATIONS TO PREVENT TRACTOR-RELATED DEATHS

Using tractors other than for their intended use may create unsafe work conditions. Tractor owners should make every effort to obtain an operator's manual for each tractor as well as other safety materials to use as training aids for safe tractor operation and service/maintenance. Tractor owners/operators should ensure that the tractor size and capacity is appropriate for the intended task. Side overturns have occurred near the edge of drainage ditches or other land depressions or obstacles – operators should leave a visual clue to identify edges of ditches/depressions/obstacles.



## RECOMMENDATIONS TO PREVENT TRACTOR-RELATED DEATHS, continued

- Read, understand and follow the safety guidelines in the tractor's Owner/Operator's Manual.
- Retrofit pre-1976 manufactured tractors with a rollover protection structure (ROPS) and seat belt. (*see University of Kentucky reference*).
- Always wear the seat belt during tractor operation in a ROPS-equipped tractor.
- Never start tractors while standing on the ground.
- Only use tractors as intended by the manufacturer (pulling stuck equipment is a misapplication of tractor use).
- If using a tractor to free a piece of stuck equipment, the operator should hitch the front of the towing tractor to the front of the stuck vehicle. Operating the tractor slowly and deliberately, and using a slow, steady pull, drive the towing tractor in reverse.

## RESOURCES

### DID YOU KNOW:

- A typical PTO shaft can:
  - Wrap up 424 feet of shoe lace in one minute at 540 rpm, or 785 feet of shoe lace at 1000 rpm?
  - Wrap your arm or leg around the PTO shaft nine times in one second at 540 PTO rpm, or nearly 16 times in one second at 1000 PTO rpm.
  - Produce second degree burns on your skin, even if you are lucky enough to have the PTO strip only the cotton clothing from your body. Nylon and other synthetics will cut into skin and muscle tissue rather than rub across it.
- The average replacement PTO shield costs less than \$100 and takes less than two hours to install.
- Hydraulic oil is under very high pressure, up to 3000 pounds per square inch. A leak in the hose could force oil under your skin and act like a poison.

- The NIOSH Division of Safety Research and Protective Technology Branch: Cost-effective rollover protective structures as an alternative to installing commercially available rollover protective structures for four tractor models; Ford 8N, Ford 3000, Ford 4000, and Massey Ferguson 135  
<http://www.cdc.gov/niosh/topics/aginjury/crops/>
- National Ag Safety Database: Tractor Safety for the Landscaping and Horticultural Services Industry  
<http://nasdonline.org/1919/d001874/tractor-safety.html>
- OSHA: Youth in Agriculture – Tractor Safety.  
<https://www.osha.gov/SLTC/youth/agriculture/tractors.html>
- Kubota Tractor Corporation: The 10 Commandments of Tractor Safety.  
<http://kubota.com/safety/TenCommandments.aspx>
- MIOSHA Safety Standard Part 51. Agricultural Tractors:  
[http://www.michigan.gov/documents/CIS\\_WSH\\_part51-53\\_83015\\_7.pdf](http://www.michigan.gov/documents/CIS_WSH_part51-53_83015_7.pdf)
- Your Guide to Available Retrofit Rollover Protection Structures (ROPS) for Agricultural Tractors Nationwide - University of Kentucky:  
<http://warehouse.ca.uky.edu/rops/ropshome.asp>
- National Ag Safety Database: A Guide To Safe Farm Tractor Operation:  
<http://nasdonline.org/1650/d001534/a-guide-to-safe-farm-tractor-operation.html>

