

**94KY097**

**Subject: Farm Tractor Overturns Crushing Part-time Farmer**

**SUMMARY**

A 38 year-old-male, part-time farmer (the victim) was crushed when the farm tractor he was operating overturned. The victim had just completed bush hogging a section of his farm and was taking his tractor to another section to continue the procedure the following day. The tractor was not equipped with Roll Over Protective Structures (ROPS) or a seat belt. The victim approached a steep gravel path leading to an upper field. About halfway up, the tractor's front wheels came off the ground, tilted backward, then rolled over to the left. The weight of the tractor tire crushed the victim's head. The victim died of cerebral hemorrhage and profound skull and facial fractures. The victim was found by his wife after she initiated a search because of his lateness for dinner. In order to prevent future fatalities of this type the FACE investigator recommends:

- Tractors should be retro-fitted with ROPS and seat belts.
- Tractors should be properly configured to complete the necessary procedures in a safe manner.
- Operators should evaluate the terrain prior to beginning an operation

Additionally, county officials should initiate a 911 Emergency Response System.

**INTRODUCTION**

On August 28, 1994, about 8:30 pm, a 38-year-old part-time farmer was killed after the tractor he was operating rolled over onto him. On August 30, the FACE investigator read of the incident in a regional newspaper. On Tuesday, September 13, 1994, the FACE investigator traveled to the scene to initiate an investigation. The county coroner and Emergency Medical Service (EMS) were interviewed. The coroner's report was obtained. The scene and tractor were measured and photographed. The county extension agent was interviewed by phone. The state police were interviewed and the death investigation report was obtained. A newspaper reporter and an equipment dealer were also interviewed. The victim's widow was not available at the time of the investigation.

The victim drove a school bus for the County Board of Education. He also maintained a medium size farm where he raised tobacco and a few head of cattle. He worked by himself most times and hired temporary help at tobacco planting and harvest time. He had lived on the farm for several years and had operated farm machinery since he was 16 years old. He had not attended any of the safety programs offered by the county extension agent.

**INVESTIGATION**

The victim had been bush hogging for about 6 hours the day of the incident. Several hills with a few paths between hills led to flatter ridges on the farm. The 1973 Long tractor (40 horse power pto) was pulling a 3 point hitch type bush hog. No ROPS, seat belt, front end weights or pto

shield were on the tractor. Its rear tires were not fluid filled.

Prior to the incident, the victim had mowed several areas of his property. The location of the incident was about 500 feet across a two lane rural road from his home. The victim began his ascent on a previously traveled mixed rock pathway. The scars on the rock in the road suggested that this path had been used before to gain access to the upper field. The slope measured 30 degrees. As the victim approached the halfway point (75' from the top), evidence at the scene suggested the tractor flipped backward, then over to the left. At some point the victim's head came between the ground and the rear tractor tire. The tractor rolled over to the left and came to rest upside down facing downhill approximately 14 feet from the victim. Evidence such as deeply fissured rear right wheel caused by the fender suggested the tractor continued to run while upside down. The bush hog remained attached to the tractor, the PTO was off. It is not known whether the victim attempted to leap from the tractor, however, the step used to mount the tractor on the left side was broken and bent downward, suggesting intense force downward. The victim was last seen by his wife about 6:30 pm when he asked her to prepare dinner. He indicated he would be home soon.

The victim was discovered by his wife about 10:00 pm. When he did not return for dinner, she began a search across the road where he was last seen. She discovered the body and returned to her house and called the emergency medical service. Emergency medical services received the call at 9:19 pm and arrived at the scene at 9:50 pm. The fire department responded to the call and arrived shortly after. State police arrived at 10:00. The coroner arrived and pronounced the victim dead at 10:40 pm and estimated the time of death at 8:30 pm. and to be almost instantaneous. He was then transported to the funeral home.

## **CAUSE OF DEATH**

The cause of death was ruled cerebral hemorrhage due to profound skull and facial fractures resulting from farm tractor accident. An autopsy was not done.

The tractor suffered moderate damage in the rollover. It was in fair condition for a tractor this age. Its hood was broken off, the exhaust broken, the SMV sign bent, fenders bent, and the right rear tire was fissured from fender contact. Its seat was rusted out and could not be secured to the tractor. Both brakes functioned properly when checked by the investigator. Gross tractor weight is 3880 pounds without fluid filled tires. Distance between the rear wheels measured 52 inches. They had been adjusted for tobacco setting. The left rear tire was one quarter fluid filled, the right was air filled. Tractor wheel base measured 76 inches. The hour meter read 0214.

The heavy duty two bladed bush hog measured 38" by 82". It had 15" rear wheels and was in poor condition. The distance between wheels on the bush hog measured 70". It had been modified and repaired in several places. It was not significantly damaged in the rollover.

## **RECOMMENDATIONS/DISCUSSION**

**Recommendation #1:** Tractor owners and operators should contact their county extension agent, local equipment dealer or equipment manufacturer to see if retro-fit rollover protection and

operator restraint systems are available for this equipment.

**Discussion #1:** The tractor in this incident, manufactured in 1973, was not equipped with a ROPS or an operator restraint system, which protects the operator in the event of a roll over (CDC NIOSH Update January 1993). ROPS first became available as optional equipment on farm tractors in 1971. These safety features were not required on tractors until 1976, when OSHA Standard 29CFR 1928.51 went into effect. This standard required employers to provide ROPS and safety belts for all employee-operated tractors manufactured after October 25, 1976. However, this standard does not apply to family farms or farms employing fewer than 11 employees. Since 1985, as a result of voluntary agreements by tractor manufacturers, all new tractors sold in the US have been equipped with ROPS and safety belts. (MMWR Jan.29, 1993) On this 1973 tractor, retro-fit ROPS and operator restraint systems are available. The cost is about \$1300.00. ROPS provide the best protection in the event of an accidental rollover (National Safety Council). Tractor owners should contact dealers, manufacturers or county extension agents for information on sources of retro-fit ROPS and operator restraint systems.

**Recommendation #2:** Operators should configure the tractor properly for the intended current use.

**Discussion #2:** The Long tractor had its wheels spread to 52" in both the front and back. The rear wheels were placed on the tractor so as to minimize the distance between them. This is often done to accommodate the distance between tobacco rows. In this case it would have been beneficial to switch wheels left for right in order to increase width and gain stability. However, this alone may not have prevented the rollover since the tractor rolled backward first, then over. As well, evenly fluid-filled tires offer traction and stability, but this alone may not have prevented the turn over.

**Recommendation #3:** Tractor owners should evaluate the terrain before beginning any operation that includes machinery.

**Discussion #3:** Access to the upper field in this incident was via a steep hill on a mixed gravel path. The rock created a very uneven surface to ascend. This likely contributed to the tractor rolling backward. The 30 degree slope was the primary factor in this rollover. An alternative route should have been selected. The added weight of the heavy-duty wide-body bush hog held by the three point hitch caused the front end to lift as the incline increased. Operators should evaluate the terrain and select a suitable path considering slope, land conditions and attachments. An alternative path, although longer, could have been chosen.

The county where this incident occurred does not have 911 emergency service. Although in this instance the outcome would not have been any different, in others, the quick notification to emergency service personnel could save a life.

## REFERENCES

Effectiveness of Roll Over Protective Structures for Preventing Injuries Associated with Agricultural Tractors. MMWR 42(03); 57-59

National Safety Council (1978). "Tractor Operation and Roll-Over Protective Structures." Occupational Safety & Health Data Sheets. I-622-Reaf. 85.

National Institute for Occupational Safety and Health (Jan 29, 1993). "NIOSH Reports on the Preventability of Tractor Rollovers." Centers for Disease Control and Prevention. DHHS (NIOSH) publication No. 93-119.

Standard Number 1928.51 Subpart C US Department of Labor Occupational Safety and Health Administration, OSHA CD-ROM (OSHA A94-2) February 1994.

US Department of Health and Human Services, PHS Center for Disease Control and Prevention NIOSH UPDATE January 29, 1993