

## **FINAL KYFACE #94KY04401**

Date: 16 June 1994

### **Subject: Part-Time Farmer Drowns In Pond After Tractor Rollover**

#### **SUMMARY**

On Sunday May 22, 1994, a 54-year-old part-time farmer died when the tractor he was operating rolled over, pinning him under water. The victim was pulling a wagon on which two children and one adult were riding on their way to the farmer's fishing pond. As the tractor approached the pond down a 14 degree slope, it began to slide on the loose ground. The tractor turned 180 degrees on the bank of the pond, then turned over into 4.5 feet of water. Evidence at the scene and from interviews with a rescuer indicate that the tractor rolled one half rotation into the pond. The tractor was not equipped with a Roll Over Protection System (ROPS) or occupant restraint. The KY FACE investigator concluded that, in order to prevent similar occurrences, tractor owners and operators should:

- Contact the county extension agent, equipment dealer or equipment manufacturer to see if retrofit rollover protection and operator restraint systems are available for their equipment.
- Evaluate the terrain before beginning any activity that involves machinery.
- Add additional weight in the form of wheel weights or liquid filled tires in order to provide traction and stability.

Additionally:

- Information regarding tractor operation and safe handling should be easily accessible to part-time farmers.
- Expand the services of 911.

#### **INTRODUCTION**

On Sunday morning, May 22, 1994, a part-time farmer drowned after the tractor he was operating rolled over into his farm pond. On Monday, May 23, the KY FACE investigator learned of the incident and began an investigation. On Friday, May 27, the FACE investigator along with the Traumatic Farm Injury Surveillance in Kentucky (TFISK) Registered Nurse traveled to the site. The tractor, wagon and pond area were photographed. The tenant farmer and EMS director were interviewed.

The victim was a part-time farmer. He owned 50 acres and maintained a herd of 30 cattle. He worked 40 hours per week in the maintenance department of a large apartment complex in a neighboring metropolitan area. His primary responsibilities included HVAC repair for the 700-unit complex. He traveled approximately 45 minutes to his farm each evening. Most weekends

were spent at the farm. He had purchased the tractor about two years prior to the incident.

## **INVESTIGATION**

The victim, hosting a fishing trip to his farm, had invited a co-worker and his family to spend Sunday at his farm. After a short hay ride, the co-worker's wife and 2 children accompanied the victim to the pond aboard a trailer pulled by the tractor. The co-worker followed on an ATV.

The tractor, a 1979 Massey-Ferguson 255, was equipped with five front end weights weighing 75 pounds each. No rear wheel axle weights, rollover protection or operator restraint system was present on the tractor. The front wheels were 51.5 inches apart; rear wheels 54 inches. Wheel base was 84 inches. The tractor did not have a Roll Over Protection Structure (ROPS) or operator restraint system.

To reach the deep valley pond the victim drove down a 14 degree slope with a 5 degree lateral tilt. The slope began approximately 1500 feet from the water's edge. A path had been mowed through the open field in a straight line toward the pond. This grass-covered/rocky path had been used before to gain access to the pond. The path turned left at the water's edge and led across the dam. Conditions were sunny and warm, however the grass was wet from morning dew.

As the victim drove down the hill, the tractor began to slide toward the pond. It appears the victim was trying to guide the sliding tractor by using the independent brakes. Fifteen feet from the water's edge, where the slope of the land increased to 20 degrees, the tractor turned toward the water and then to the right, away from the dam, and turned over (making nearly a 180 degree turn to the right). The trailer disconnected from the tractor and stopped near the water's edge. The tractor came to rest in 4.5 feet of water, pinning the victim under the right fender. Approximately 2 feet of the tractor's left rear wheel could be seen above the water.

Immediate attempts to dislodge him were unsuccessful. The co-worker drove the ATV to the tenant farm house to summon help. Emergency Medical Services (EMS) was called at 10:23 and dispatched at 10:28. EMS arrived at the scene at 10:37. The fire department was already at the scene. After chaining the tractor to a 4 wheel drive pick up, the victim was dislodged from under the tractor. EMS personnel established an airway, suctioned the victim and continued CPR. The victim was loaded onto a long board and transferred to an awaiting helicopter at 11:07. The victim was pronounced dead at the University hospital at 11:54 am. It is estimated the victim was under water between 15 and 20 minutes.

The 1979 Massey-Ferguson 255 tractor suffered moderate damage in the incident. The brakes worked at the time of the investigation and were set to operate independently. The multipower Hi/Low level was set at Low. A warning label "Shift to high for engine braking" was visible next to the lever. The exhaust was broken off, seat bent and hood damaged. Dried algae was visible on various tractor parts. The lift arm of the three-point hitch had been broken prior to the incident and had been repaired. Tires were air filled, containing no liquid. Front end weight of 375 pounds was visible.

The two wheeled trailer, with a flat wood surface, was of heavy duty construction. Its tongue

extended approximately five feet from the bed. The wagon's tongue, at the point of attachment, was damaged.

## **CAUSE OF DEATH**

The coroner ruled the cause of death as post traumatic pulmonary insufficiency due to interthoracic injury due to accidental drowning. Toxicology results were negative.

## **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 their equipment.

**Discussion #1:** The tractor in this incident, manufactured in 1979, was not equipped with a ROPS or an operator restraint system, which protects the operator in the event of a rollover. 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 1979 tractor, retro-fit ROPS and operator restraint systems are available. Tractor owners should contact dealers, manufacturers or county extension agents for information on sources of retrofit ROPS and operator restraint systems. Although the cause of death was drowning in this case, ROPS may have allowed the victim an escape route.

**Recommendation #2:** Tractor owners should evaluate the terrain before beginning any operation that includes machinery.

**Discussion #2:** The access to the pond in this incident was via a steep hill with a laterally sloping grass/rock path. The grass may have been wet at the early morning hour, the sun having not yet reached over the hill. This likely contributed to the tractor sliding. The slope of 14 degrees with lateral slope of 5 degrees was extreme. The added weight of the trailer pushing the tractor was also a factor. 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.

**Recommendation #3:** Tractor owners and operators should, when operating on sloping terrain, fill their tires with water containing an anti-freeze ingredient (calcium chloride or ethylene glycol) to increase weight and tractor stability. Axle weights can also be added to increase stability.

**Discussion #3:** Weight distribution of the tractor is critical on sloping land. By increasing rear tire weight with fluid or axle weights, tractor stability increases. Water can be added to the tires through the valve stem opening. This service is offered by many farm implement dealerships. On

this tractor, fluid filled tires could have add up to 400 pounds per tire. It is uncertain whether tire weight alone could have prevented this fatality, however added weight provides traction and balance.

Additionally, owners/operators should be offered safety courses and materials to identify hazards, evaluate risk and develop safe operating procedures. The information should be easily accessible to the part-time farmer. Offering such information to farmers through county extension agents can be an avenue for intervention and prevention.

As a part-time farmer, the victim had only part-time experience on his equipment. Education could have: (1) shown the victim hazards of hillside tractor operation; (2) illustrated how to use the Hi/Low switch for engine braking; and (3) helped the victim to select a different approach to his pond.

The emergency medical services arrived at the scene very quickly. The communication through two-way radio and telephone effectively notified personnel of the incident. However, 911 should be implemented county-wide because it is recognized by the public as the number to call in the event of an emergency.

## **REFERENCES**

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

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.