Fatality **A**ssessment and **C**ontrol **E**valuation Project

Public Health

KY FACE #97KY029

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TO: Carl Spurlock, Ph.D., Director, Kentucky Injury Prevention and Research Center, and Epidemiologist, Kentucky Department for Public Health

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SUBJECT: Rear Tractor Rollover Kills Farmer

SUMMARY

A 67-year-old male farmer (the victim) died when the tractor he was operating flipped over backward, pinning him between it and another tractor. He and his 13-year-old grandson had been working with a tractor and rotary mower, but got stuck in the mud of a creek bed; approximately one-third of the rear tractor tires were buried in mud. He had gotten a second tractor, attached a chain from the rear of it to the front of the first tractor, and had just begun to try and pull the tractor out when the incident occurred. From evidence at the scene it appeared that his foot slipped off the clutch, causing the tractor to lurch forward suddenly and flip over backward. His grandson, who had been on the tractor that was stuck, ran more than a mile to the house to summon help. Emergency Medical Services (EMS) personnel arrived, found no signs of life, and called the coroner, who pronounced the victim dead at the scene. In order to prevent similar occurrences, the KY FACE investigator recommends that:

- *an appropriate tractor be chosen to perform the particular task;*
- *all tractors be equipped with rollover protective structures (ROPS) and seatbelts;*
- *front-end counterweights be used to lower the center of gravity and improve traction and stability;*
- *tractors be kept in safe operating condition; and,*

- *tractor operators consider environmental conditions and terrain and make necessary adjustments to accommodate to them.*

INTRODUCTION

On 24 March 1997, a 67-year-old farmer died of massive internal trauma after his tractor rolled over. KY FACE was notified by a phone call from the coroner who handled the case. On the advice of the coroner the site investigation was postponed due to continuing rain. On 8 July a KY FACE investigator traveled to the scene. An interview was conducted with the coroner, who supplied photographs from the sheriff's department and copies of the death certificate and the ambulance run report. Photographs were taken of the two tractors and the rotary mower at the home of the victim; however the site where the incident occurred was not photographed because, according to information provided by the victim's son, the constant rain had made it unrecognizable and it was very difficult to reach. The victim's son and grandson reside out of state.

The victim had recently retired from his job in private industry and returned to the farm on which he was born and raised, and which he had continued to farm part-time throughout his life. He had recently acquired additional land, which he and his grandson were clearing at the time of the incident. He was in good health, and popular among his neighbors.

INVESTIGATION

The tractor that the victim was using was a Ferguson Model TO-30, manufactured in England between 1951 and 1954. It was a gas-powered, four-cylinder tractor, approximately 25 horsepower. Total weight was 2600 pounds. It was not equipped with a rollover protective structure (ROPS) or a seatbelt. No counterweights were attached. The left rear tire was about three-quarters fluid-filled; the right was air-filled. The tractor was in fair operating condition, although quite rusty.

The tractor that was stuck in the mud was an IMT Model 542 DeLuxe, manufactured in Yugoslavia between 1986 and 1993. It was a diesel, 42 horsepower, weighing 4100 pounds.

On the day of the incident, the weather was clear and cool, but recent rains had left the ground wet and very muddy. The area where the victim and his 13-year-old grandson were working was an old creek bed. They were using the IMT tractor with a rotary mower attached to clear land. When this tractor became stuck in the mud - its rear wheels were one-third buried in mud - the victim returned to the house and brought back the small Ferguson tractor to try and pull it out. He attached a chain near the PTO shaft on the rear of the Ferguson and to a hook on the front grate of the IMT. The Ferguson did not have a rear drawbar, but its PTO shaft was low enough, and equipped with a hook, for attaching the chain. As soon as he began to pull, the Ferguson tractor lurched forward, reared up and flipped over backward, trapping the victim between its left rear wheel and the front grate of the IMT. According to the coroner and others at the scene, the thick mud on the bottom of the victim's left boot was "sliced," as if his foot had slipped off the clutch,

which was a single metal bar rather than a rubber pedal. As soon as the tractor flipped over, the grandson ran back to the house, approximately one mile, and called 911. The EMS dispatcher received the call at 3:26 pm. The trip to the house was 23 miles, but the terrain between the house and the incident site was very rough. The EMS workers arrived at the scene at 4:00 pm. Finding no pulse or other vital signs, they placed a call to the coroner, who pronounced the victim dead as of approximately 3:00 pm.

CAUSE OF DEATH

The death certificate listed the cause of death as massive internal trauma. No autopsy was performed.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: *An appropriate tractor should be chosen to perform the particular task at hand.*

Discussion #1: *The tractor that was stuck weighed 4100 pounds. The tractor the victim used to try and pull it out of the mud weighed 2600 pounds, and was only about 25 horsepower. It was not powerful enough to perform this task. If the victim did not own another, more powerful tractor, perhaps he could have borrowed one from a neighbor to perform this particular job.*

Recommendation #2: *All tractors should be equipped with rollover protective structures (ROPS) and seatbelts.*

Discussion #2: *In this case, the tractor which rolled over was manufactured by The Standard Motor Co., Ltd., of Coventry, England, between 1951 and 1954. No listing was found for it in directories of ROPS-kit providers, so it is possible that none was available. Moreover, the tractor was so rusted that it might not have supported a ROPS. This tractor, therefore, should have been reserved for use under less hazardous conditions. Whenever possible, operators should use non-ROPS-equipped tractors for safer work areas and/or activities. Since 1985, as a result of voluntary agreements among tractor manufacturers, virtually all new tractors sold in the US have been equipped with ROPS and seatbelts, which protect the operator by creating a "zone of protection." Furthermore, many tractor manufacturers are currently offering ROPS retrofit kits at cost to encourage owners of non-ROPS-equipped tractors to have them installed.*

Recommendation #3: *Front-end counterweights should be used to lower the center of gravity and improve traction and stability.*

Discussion #3: *Additional weight on the front of the tractor can substantially improve tractor stability. While it is impossible to say that they would have prevented this rear rollover, they are always worthwhile safeguards.*

Recommendation #4: *Tractors should be kept in safe operating condition.*

Discussion #4: *The clutch on the tractor in this case was a small metal bar. Originally it had a rubber pedal attached. Evidence suggests that the victim's foot slipped off the clutch, causing the tractor to suddenly lurch forward and flip over. It is possible that replacement of the rubber pedal might have prevented slippage.*

Recommendation #5: *Tractor operators should consider environmental conditions and terrain and make necessary adjustments to accommodate to them.*

Discussion #5: *In this case, the deep mud was a major contributing factor. The mud caused the first tractor to become stuck, and the mud on the victim's boot probably caused his foot to slip off the clutch. If at all possible, the area should have been avoided until dry weather arrived.*

REFERENCE:

Murphy, Dennis J. 1992. *Safety and Health for Production Agriculture.* St. Joseph MI: American Society of Agricultural Engineers.