

**DATE:** November 26, 1996

**FROM:** Minnesota Fatality Assessment and Control Evaluation (MN FACE) Program  
Minnesota Department of Health

**SUBJECT:** MN FACE Investigation 96MN07001  
Farmer Dies After Tractor He was Driving Rolled Over on Him

## **SUMMARY**

An 87-year-old farmer (victim) died of injuries he sustained when the tractor he was driving overturned. He used the tractor to pull a trailer into a pasture to repair a fence. After several fence posts and a few hand tools were loaded into the trailer, the victim's son walked around the pasture to chase several cows toward an opening in the fence where they had escaped. While he walked around the pasture, the victim drove the tractor pulling the trailer from the farm yard. The victim drove through a cattle lot and down a hill toward the pasture. He drove along a dirt path through an opening in a fence that divided the lot from the pasture. As the tractor entered the pasture, the tractor began to slide down a steep embankment before it overturned to the left. It came to rest upside down against a tree near the bottom of the embankment. The victim's son, while walking along the pasture fence, heard some commotion from the area of the incident and also heard the tractor engine stop but was not alarmed by the sounds. Approximately 2-3 minutes later, he arrived at the location where he thought his father would have stopped the tractor. He looked around and discovered the overturned tractor and his father underneath it. After examining the scene and realizing that his father was pinned under the tractor, he ran to the farm house and placed a call to emergency medical personnel. He then drove another tractor equipped with a front-end loader to the scene and used it to lift the front end of the overturned tractor high enough to free his father. Shortly after the victim was freed, emergency personnel arrived and pronounced the victim dead. MN FACE investigators concluded that to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- all tractors should be equipped with a rollover protective structure and a seat belt;  
and
- tractor operators should be trained to recognize and understand the hazards associated with towing items.

## **INTRODUCTION**

On October 23, 1996, MN FACE investigators were notified of a farm work-related fatality that occurred on August 5, 1996. The county sheriff's department was contacted and releasable information obtained. Information obtained included a copy of their report of the incident and copies of their photos of the incident site. A site investigation was conducted by a MN FACE investigator on November 14, 1996. During MN FACE investigations, incident information is obtained from a variety of sources such as law enforcement agencies, county coroners and medical examiners, employers, coworkers and family members.

## **INVESTIGATION**

On the day of the incident, the victim used a farm tractor to pull a four wheel trailer into a farm pasture to repair a fence. The tractor was approximately 50 years old and was not equipped with a rollover protective structure and a seat belt. It had a narrow front wheel configuration and did not have dual wheels on either rear axle. The tractor was equipped with manual brakes on each rear wheel. The brakes were operated independently via hand levers located on either side of the operator's seat and adjacent to each rear wheel fender. The four wheel general purpose trailer consisted of a flat bed that was about ten feet long and had 10 inch high side boards. In the trailer were several steel fence posts, several hand tools and a small quantity of supplies for repairing fences. Rainfall several days before the incident resulted in the ground being wet at the time of the incident.

After the fence posts and other items were loaded into the trailer, the victim's son walked along the west side of a pasture to chase several cows toward an opening in the fence where they had escaped. While the victim's son walked around the pasture, the victim drove the tractor pulling the trailer from the farm yard. The victim drove through a cattle lot on the north side of a barn and down a hill toward the pasture. He drove along a dirt path on the west edge of the lot and through an opening in a fence that divided the lot from the pasture. The dirt path was approximately 6 to 7 feet wide and sloped approximately 5 degrees to the left in the area where the lot and the pasture met. As the tractor entered the pasture, the left rear wheel followed along the left side of the path and along the ridge of inclined terrain that sloped downhill between 45 to 50 degrees. Skid marks in the dirt path indicated that the tractor slid partially down the steep embankment before it overturned to the left. It came to rest upside down against a tree near the bottom of the embankment. The trailer remained hooked to the tractor drawbar but did not overturn and came to rest against another tree.

The victim's son, while walking along the pasture fence, heard some commotion from the area of the incident and also heard the tractor engine stop but was not alarmed by the sounds. Approximately 2-3

minutes later, he arrived at the location where he thought his father would have stopped the tractor. He looked around and discovered the overturned tractor and his father underneath it. After examining the scene and realizing that his father was pinned under the tractor, he ran to the farm house and placed a call to emergency medical personnel. He then drove another tractor equipped with a front-end loader to the scene and used it to lift the front end of the overturned tractor high enough to free his father. Shortly after the victim was freed, emergency personnel arrived and pronounced the victim dead.

## **CAUSE OF DEATH**

The cause of death listed on the death certificate was massive closed chest trauma due to tractor rollover accident.

## **RECOMMENDATIONS/DISCUSSION**

**Recommendation #1:** All tractors should be equipped with a rollover protective structure and a seat belt.

**Discussion:** Preventing death and serious injury to tractor operators during tractor rollovers requires the use of a rollover protective structure and a seat belt. These structures, either a roll-bar frame or an enclosed roll-protective cab, are designed to withstand the dynamic forces acting on them during a rollover. In addition, seat belt use is necessary to ensure that the operator remains within the "zone of protection" provided by the rollover protective structure. Government regulations require that all tractors built after October 25, 1976, and used by employees of a farm owner must be equipped with a rollover protective structure and a seat belt. Many older tractors are in use on family farms and do not have, nor are they required by government regulation to have, such structures to protect their operators in case of a rollover. All older tractors should be fitted with a properly designed, manufactured, and installed rollover protective structure and seat belt. If the tractor involved in this incident had been fitted with a rollover protective structure and a seat belt, and the seat belt had been in use, this fatality might have been prevented.

**Recommendation #2:** Tractor operators should be trained to recognize and understand the hazards associated with towing items.

**Discussion:** The momentum of a vehicle in motion is directly proportional to the mass and speed of the vehicle. The total momentum of a tractor and a towed unit or units consists of the momentum of the tractor plus the momentum of the towed unit(s). If the total mass of a towed unit or units exceeds

the mass of the tractor pulling them, dangerous situations may be created, especially as speed increases, while turning, or while driving on surfaces such as dirt paths or grass covered areas where traction may be reduced. Although the mass of the trailer probably did not exceed the mass of the tractor in this case, the momentum of the trailer may have contributed to a condition that increased the potential for loss of control by the operator. All of these factors either were or may have been present and contributed to the occurrence of this incident. Recognition and understanding of the hazards associated with towing items is essential to reduce the likelihood of dangerous situations that may result in tractor rollovers.

## REFERENCES

1. Office of the Federal Register: Code of Federal Regulations, Labor, 29 CFR Part 1928.51 (b), U.S. Department of Labor, Occupational Safety and Health Administration, Washington, D.C., April 25, 1975.

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