



The National Institute for Occupational Safety and Health (NIOSH)



Farm Youth Dies After Tractor He was Driving Rolled Over on Him

Minnesota FACE 94MN039

SUMMARY

A 16-year-old male (victim) died from injuries sustained when the tractor he was driving overturned. The tractor was not equipped with a rollover protective structure or a general purpose enclosed cab. The tractor was capable of traveling at a maximum speed of approximately 16-18 miles per hour. The victim drove west on a paved public highway that did not have shoulders. A passenger rode on the tractor to the driver's left, leaning against the tractor fender. As the victim drove down the highway, the right wheels of the tractor left the road surface. As the tractor traveled forward, the right wheels cut into the soft grass covered ditch. Tracks in the grass indicated the victim turned the steering wheel sharply to the left to drive the tractor back onto the road. When the right front wheel struck the edge of the paved road surface, the tractor suddenly turned nearly cross ways in the road. As a result of the speed of travel and the sudden turn to the left, the tractor overturned. The tractor rolled to the right side and came to rest in an inverted position on the road. The victim was pinned underneath the tractor. The passenger was slightly injured when he was thrown clear of the tractor and landed in the road ditch. MN FACE investigators concluded that, in order 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;
- operators of tractors should maintain safe operating speeds at all times; and
- operators should not allow passengers to ride on tractors.

INTRODUCTION

On July 18, 1994, MN FACE investigators were notified of a farm work-related fatality which occurred on July 17, 1994. The state highway patrol was contacted and releasable information obtained. Information obtained included a copy of their report of the incident. A site investigation was conducted by a MN FACE investigator on August 8, 1994. During the site investigation, information concerning the incident was provided by the victim's stepmother.

INVESTIGATION

The victim was driving a farm tractor on a public highway. The tractor was approximately 25-30 years old and was not equipped with any type of rollover protective structure or a general purpose enclosed cab. It had a wide front wheel configuration and was not equipped with dual rear wheels. The tractor was capable of traveling at a maximum speed of approximately 16-18 miles per hour.

The victim and a 16-year-old companion used the tractor to pull two empty hay racks to a farm field. After they unhooked the hay racks, they left the field while driving the tractor to return to the farm yard. The victim drove west on an asphalt surfaced highway that did not have shoulders. The passenger rode on the tractor to the driver's left, leaning against the tractor fender. The road was straight in the vicinity of the accident, and its surface was dry at the time of the incident.

As the victim drove down the highway, he inadvertently drove the right wheels of the tractor off the paved surface of the road. Skid marks on the paved road surface indicated that the tractor was probably traveling at or near its maximum possible speed. After the right wheels left the road surface, they cut into the grass covered ditch which was soft due to recent rain. The tracks in the grass indicated the victim turned the steering wheel sharply to the left to drive the tractor back onto the road surface. As a result, the tractor turned abruptly to the left, the right front wheel struck the edge of the paved road surface, and the tractor turned nearly crossways at the edge of the road. Because of the speed of travel, the slope of the ditch, and the over-steering to the left, the tractor overturned. The tractor rolled 180 degrees to the right side and came to rest in an inverted position on the road. The victim was pinned underneath the tractor. The passenger was slightly injured when he was thrown clear of the tractor and landed in the road ditch.

Emergency medical personnel arrived at the scene within minutes after the accident occurred. They removed the victim from underneath the tractor, and he was pronounced dead at the scene.

CAUSE OF DEATH

The cause of death listed on the death certificate was pulmonary edema and congestion.

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: Operators of tractors should maintain safe operating speeds at all times.

Discussion: Tractors should always be driven at speeds which allow the operator to maintain complete control of the tractor. Operators need to maintain complete control at all times to avoid all types of accidents including rollovers. This requires that the tractor speed be kept slow enough to allow the operator to safely react to unexpected situations and hazards. Safe operating speeds may vary slightly between operators because of such factors as the operator's age, years of experience, and familiarity with the specific tractor or machinery being operated. Farm youths should maintain slower operating speeds because of their overall lack of experience with all types of motorized vehicles. If the victim had been driving at a slower speed, he may have been able to maintain control of the tractor, and this fatality might have been prevented.

Recommendation #3: Operators should not allow passengers to ride on tractors.

Discussion: Tractors are designed to carry only one person, the operator. In addition, the operator has a single proper position and place to ride which is sitting in the operator's seat. Tractor passengers are exposed to various hazards such as unexpected bumps and sudden turns that could toss them off the tractor. Even tractors with totally enclosed rollover protective structures are not designed to carry passengers. Since only an operator's seat belt is provided, a passenger may not remain within the "zone of protection" during a rollover. Passengers cannot anticipate every tractor movement or sudden stops and starts by the operator. In addition, passengers may interfere with the operation of control levers and may distract the operator's attention from the task being performed.

It is safer to provide an additional tractor for a passenger to drive or to use a pickup truck or other motor vehicle in which the passenger can ride. If the victim had been driving alone, he may not have inadvertently driven the right wheels off the roadway, and this incident and fatality might have been prevented.

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.
2. Agriculture Safety, Fundamentals of Machine Operation, 1987, Deere & Company, Moline, Illinois, Third Edition.

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[Back to Minnesota FACE reports](#)

[Back to NIOSH FACE Web](#)

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