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Farmer Dies After Tractor He was Driving Rolled Over on Him

DATE: November 4, 1994
MN FACE Investigation 94MN04801

SUMMARY

A 47-year-old male (victim) died from injuries sustained when the tractor he was driving overturned and caught fire. The tractor was not equipped with either a rollover protective structure or a general purpose cab. It had a wide front wheel configuration. It was not equipped with dual rear wheels. A front-end loader equipped with a general purpose bucket was mounted on the tractor. A sickle mower with a cutting bar 7 feet long was mounted to the quick-attach drawbar at the rear of the tractor. The victim was cutting hay in a township road ditch when the incident occurred.

He was making the first cut through the ditch driving south across inclined terrain which sloped to his right. The mower cutting bar extended to the right side of the tractor and was on the downhill side of the tractor as he drove through the ditch. The tractor suddenly rolled 180 degrees to the right and came to rest in an inverted position at the bottom of the ditch. After the tractor overturned and pinned the victim underneath it, it caught fire and burned. 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;
- all mounted equipment not required for the task being performed should be removed from tractors; and
- side-mounted equipment should be kept on the uphill side of tractors when crossing sloping terrain.

INTRODUCTION

On September 8, 1994, MN FACE investigators were notified of a farm work-related fatality which occurred on August 5, 1994. The county sheriff's department was contacted and releasable information obtained. Information obtained included a copy of their report and copies of photos of the incident. A site investigation was conducted by a MN FACE investigator on September 26, 1994. During the site investigation, information concerning the incident was provided by the victim's son. The victim's brother provided additional information during a telephone interview with a MN FACE investigator.

INVESTIGATION

The victim used a tractor and a rear mounted sickle mower to mow hay in a township road ditch along his farmland. The tractor was approximately 25 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 mower sickle bar was 7 feet long and extended to the right side of the tractor. A front-end loader equipped with a general purpose bucket was mounted on the tractor.

The victim was working alone cutting hay in a township road ditch when the incident occurred. He had cut and baled hay in the ditch, once per year, for several previous years. He was making the first cut through the ditch driving south across inclined terrain which sloped to his right. The slope of the ditch at the location where the tractor overturned was approximately 47 percent. This was obtained by dividing the measured vertical drop of the terrain (2.0 feet) by the measured horizontal distance (4.25 feet).

The victim drove the tractor with the left wheels along the edge of a corn field which was adjacent to the ditch. The mower cutting bar was on the downhill side of the tractor as he drove through the ditch. The left rear wheel drove over a piece of sod which was hidden from view by the tall hay. The piece of sod was approximately 4.5 inches thick by 12 inches wide by 20 inches long. Apparently when the left rear wheel traveled over the piece of sod, the additional tilt of the tractor caused it to suddenly roll 180 degrees to the right. It came to rest in an inverted position at the bottom of the ditch. After the tractor overturned and pinned the victim underneath, it caught fire and burned. The fire probably began as a result of gas leaking onto the hot engine or exhaust system.

Family members did not know how high the loader might have been when the tractor overturned. They indicated that the loader bucket was empty at the time of the incident. They did not know how fast the tractor was traveling but did not think speed was a contributing factor in the incident. The victim's son said the piece of sod apparently was cut from the edge of the field and rolled into the ditch. He thought this probably happened when a field disc was used to prepare the field for planting earlier this year.

Emergency medical personnel arrived at the scene after being notified that a tractor had overturned and caught fire. After the fire was extinguished, they discovered and removed the victim from underneath the tractor. He was pronounced dead at the scene.

CAUSE OF DEATH

The cause of death listed on the death certificate was massive crush injuries.

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 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 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: All mounted equipment not required for the task being performed should be removed from

tractors.

Discussion: Equipment mounted on tractors increases the potential for accidents for several reasons. Mounted equipment may raise the center of gravity, it may interfere with the operator's visibility, and it may make the tractor more difficult to control at high speeds and during turns. The tractor involved in this incident had a front-end loader mounted on it. The loader was not required for the task, mowing hay, which was being performed. A front-end loader mounted on a tractor raises the tractor's center of gravity. In addition, the center of gravity rises further as the height of the loader is increased. Raising the center of gravity increases the potential of a side rollover, especially if the tractor is driven across inclined terrain. If the front-end loader had been removed from the tractor prior to mowing hay in the road ditch, this rollover and fatality might have been prevented.

Recommendation #3: Side-mounted equipment should be kept on the uphill side of tractors when crossing sloping terrain.

Discussion: When crossing sloping terrain, side-mounted equipment increases the potential of a rollover when the equipment is on the downhill side of the tractor. Factors which increase the potential for a side-rollover include the height of the mounted equipment, the distance it extends to the side of the tractor, and the weight of the equipment. If a tractor is driven across sloping terrain with the side-mounted equipment on the uphill side, these factor act to reduce the likelihood of a side-rollover. If the tractor involved in this incident had been driven in the opposite direction near the bottom of the ditch, the cutting bar would have been on the uphill side of the tractor and this 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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