DATE: January 23, 1997

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

SUBJECT: MN FACE Investigation 96MN09301
Farmer Dies After Tractor He was Driving Rolled Over on Him

SUMMARY

A 52-year-old farmer (victim) died of injuries sustained when the tractor he was driving overturned. On the day of the incident, he used a farm tractor equipped with a front-end loader to move a large round hay bale. The tractor was not equipped with a general purpose enclosed cab or a rollover protective structure and a seat belt. The victim used the tractor and loader to pick up and haul a bale along a curved field road. While he backed the tractor counter-clockwise through a curve in the field road, the left rear wheel of the tractor traveled off of the surface of the road and entered the ditch. Because of the tilt of the tractor as the left wheel traveled into the ditch and the height of the loader and bale, the tractor overturned to the left side. It came to rest upside down in the grass covered field along the side of the driveway. The overturned tractor was discovered by the victim's brother who went to the farm yard and notified the victim's wife. After she called emergency medical personnel, they returned to the scene of the incident and began to administer resuscitation efforts. Rescue personnel arrived shortly after being notified and transferred the victim to a local hospital where he was pronounced 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

- while in motion, tractors with loaders should be operated with the loader in the lowest possible position.

INTRODUCTION

On December 23, 1996, MN FACE investigators were notified of a farm work-related fatality that occurred on October 4, 1995. The county sheriff's department was contacted and releasable

information obtained. Information obtained included a copy of their report and copies of their photos of the incident site. A site investigation was not conducted by MN FACE investigators. 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 equipped with a front-end loader to move a large round hay bale. The tractor and loader were approximately 40 years old. The tractor was not equipped with a general purpose enclosed cab or a rollover protective structure. It had a narrow front wheel configuration and did not have dual wheels on either rear axle. The front-end loader was equipped with a general purpose bucket with tines that were pushed into one end of the bale. The tines functioned similar to a large bale spear and held the bale as it was transported by the victim.

The diameter of the bale was approximately five feet and it was also approximately five feet long. Although the weight of the bale could not be determined, the weight of large round hay bales varies from 750 to 2000 pounds. The victim used the tractor and loader to pick up and haul the bale along a curved field road. While he backed the tractor counter-clockwise through the curve in the field road, the left rear wheel of the tractor traveled off of the surface of the road and entered the ditch on the operator's left side. The slope of the ditch was estimated from photos of the incident scene as approximately 15-20 degrees. Because of the tilt of the tractor as the left wheel traveled into the ditch and the height of the loader and bale, the tractor overturned 180 degrees to the left side. It came to rest upside down in the grass covered field along the side of the driveway. The overturned tractor was discovered by the victim's brother who went to the farm yard and notified the victim's wife. After she called emergency medical personnel, they returned to the scene of the incident and began to administer resuscitation efforts. Rescue personnel arrived shortly after being notified and transferred the victim to a local hospital where he was pronounced dead.

CAUSE OF DEATH

The cause of death listed on the death certificate was laceration of the right atrium due to tractor rollover.

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: While in motion, tractors with loaders should be operated with the loader in the lowest possible position.

Discussion: 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 and as the weight of items carried by the loader increases. Raising the center of gravity of a tractor increases the potential of a side rollover. The potential of a side rollover also increases if the wheels on one side of the tractor travel through holes, ruts, and depressions that cause the tractor to tilt to one side. Whenever a tractor equipped with a front-end loader is used and the tractor is in motion, the loader should be kept as low as possible. This is particularly important to reduce the risk of a rollover to the side if heavy items are being transported and if the tractor is driven across inclined terrain.

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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