

DATE: July 24, 1996

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

SUBJECT: MN FACE Investigation 96MN03901
Farmer Dies After Becoming Entangled in The Unloading Beaters of a
Forage Wagon

SUMMARY

A 50-year-old male farmer (victim) died from injuries sustained when he became entangled in the unloading beaters of a forage wagon. On the day of the incident, the victim was cleaning pieces of bark from the wagon that was used during the winter months to store cut firewood. It was equipped with a power-take-off driven unloading mechanism that operated three unloading beaters mounted across the front of the wagon. The victim hooked the forage wagon to the drawbar of a farm tractor and drove onto a field driveway near the farm yard. He connected the wagon's power-take-off shaft to the tractor and engaged the tractor's power-take-off to remove bark and debris from the wagon. While inside the wagon, he contacted the rotating unloading beaters and became entangled in them. The tractor's engine was idling at a slow speed and stopped when the victim became entangled. Approximately 45 minutes after the victim began to clean the wagon, he was discovered by his son. A 911 phone call was immediately made to emergency medical personnel. They arrived shortly after being notified and removed the victim from the wagon. He was transported to a local hospital where he was pronounced dead by the attending physician. MN FACE investigators concluded that, in order to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- operators should turn off the engine and remove the key before dismounting from a tractor;
- operators should disengage the power-take-off before dismounting from a tractor; and
- operators should not wear loose-fitting clothing near or while operating machines.

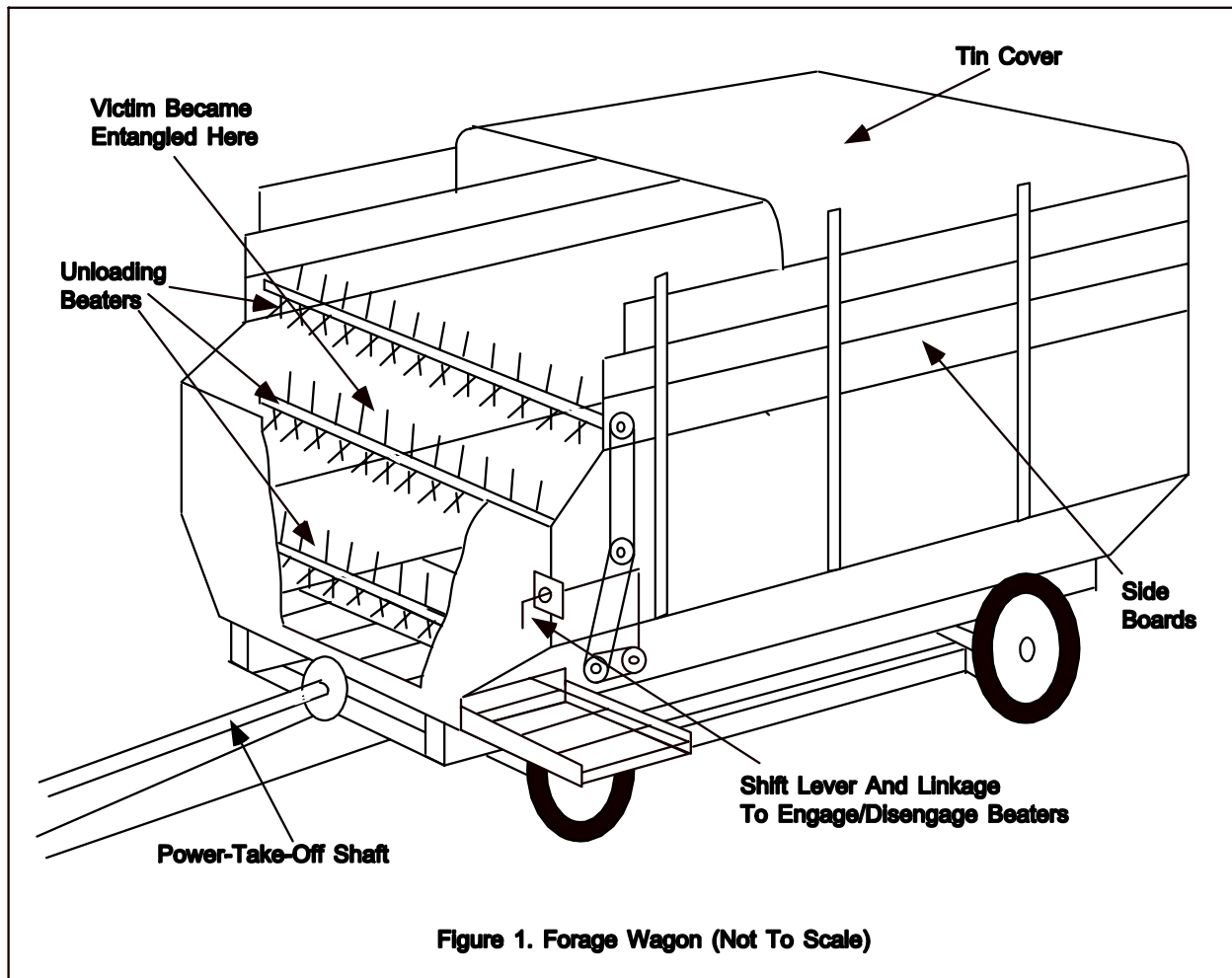
INTRODUCTION

On May 28, 1996, MN FACE investigators were notified of a farm work-related fatality which occurred on April 17, 1996. 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 site. A site investigation was conducted by a MN FACE investigator on July 1, 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 was cleaning pieces of bark from a self-unloading forage wagon. The wagon (Figure 1) was used during the winter months to store cut and split firewood. It was equipped with a power-take-off driven unloading mechanism that operated three beaters mounted across the front of the wagon. The wagon was originally equipped by the manufacturer with two unloading beaters mounted in the steel sides of the wagon. The third beater was mounted in the side boards that were fastened to the sides of the wagon. It was operated via a chain and sprocket from the middle beater. The top two beaters were positioned in a vertical configuration (i.e., one above another) while the lowest beater was positioned approximately 12 inches forward of the other two beaters. An apron chain moved material in the wagon from the back to the front of it when the power-take-off was engaged. The apron chain consisted of two parallel chains connected by cross bars that were approximately 45 inches long. A second apron chain was located across the front of the wagon and beneath the unloading beaters. It transferred chopped feed or other material from the wagon. The wagon was also equipped with a control lever to independently engage or disengage the unloading beaters. This enabled the power-take-off to operate only the apron chains.

The victim hooked the forage wagon to the drawbar of a farm tractor and drove onto a field driveway near the farm yard. He connected the wagon's power-take-off shaft to the tractor and engaged the tractor's power-take-off to remove bark and debris from the wagon. He did not shift the control lever for the unloading beaters to the disengaged position before he entered the wagon through two hinged doors across the back of it. While inside the wagon, he contacted the rotating beaters and became entangled in them. The tractor's engine was idling at a slow speed



and stopped when the victim became entangled in the beaters. Approximately 45 minutes after the victim began to clean the wagon, he was discovered by his son. A 911 phone call was immediately made to emergency medical personnel. They arrived shortly after being notified and removed the victim from the wagon. He was transported to a local hospital where he was pronounced dead by the attending physician.

CAUSE OF DEATH

The cause of death listed on the death certificate was concussion and crush injuries of the lungs.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Operators should turn off the engine and remove the key before

dismounting from a tractor.

Discussion: The risk of injury or death, due to entanglement, can be eliminated by stopping the engine and removing the ignition key before operators dismount from tractors. Stopping the engine and removing the key provides protection from power-take-off shaft entanglement and entanglement in moving machine parts. It also protects from unexpected engagement of power by another person while the operator is cleaning, lubricating, adjusting, or repairing a machine. In this case, if the tractor engine had been stopped and the ignition key removed before the operator dismounted from the tractor, this fatality would have been prevented.

Recommendation #2: Operators should disengage the power-take-off before dismounting from a tractor.

Discussion: Entanglements in power-take-off shafts and machinery components can be prevented by disengaging the tractor's power-take-off before operators dismount from the tractor. Although this may not be possible in certain cases where a tractor is used to power a stationary machine, it should always be done when the operator is using portable equipment, such as the forage wagon in this incident. A general safe work practice that operators should follow to reduce the risk of entanglement is to always disengage the power-take-off before dismounting from a tractor.

Recommendation #3: Operators should not wear loose-fitting clothing near or while operating machines.

Discussion: The risk of entanglement in rotating shafts and machine components can be reduced if operators do not wear loose fitting clothing. Work clothing should be close-fitting and zippered or buttoned, not open. Frayed or loose fitting clothes, jackets and sweatshirts with drawstrings, and boots or shoes with long shoelaces should be avoided. Although it did not appear that the victim in this incident was wearing loose fitting clothing, this recommendation is a general safe work practice that should always be followed by operators of machines and equipment whenever the risk of entanglement exists.

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