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

SUBJECT: MN FACE Investigation 98MN05901
Farmer Dies After Becoming Entangled In A Rotating Shaft Of A Beet
Lifter

SUMMARY

A 20-year-old male farmer (victim) died after he became entangled in a rotating shaft of a beet lifter. On the day of the incident, the victim was harvesting beets in a farm field. The beet lifter was pulled by a farm tractor through the field to harvest beets. While harvesting beets a portion of the beet lifter known as the grab rollers became clogged with dirt. The victim stopped the tractor, disengaged the tractor's power-take-off and dismounted the tractor. Another worker who was in the field with a truck drove to the location to assist in cleaning the dirt from the lifter. They manually removed most of the dirt and then engaged the tractor's power-take-off. After engaging the power-take-off the victim dismounted the tractor while the lifter was operating. He walked to a location along one side of the machine and leaned over a rotating shaft. The rotating shaft had originally been covered by a shield however the shield was not in place at the time of the incident. While the victim leaned over the rotating shaft, his jacket was caught by it and became entangled in the shaft. The coworker climbed onto the tractor and disengaged the tractor's power-take-off. He checked the victim who was unresponsive and then used a two-way radio to notify family members of the incident. They placed a call to emergency personnel before proceeding to the field. Rescue personnel arrived at the scene shortly after being notified and pronounced the victim dead prior to freeing him. MN FACE investigators concluded that, in order to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- operators should disengage the power-take-off before dismounting from a tractor;
- all equipment shields and guards should be kept in good condition and in place;
- and

- operators should not wear loose-fitting clothing near operating machines.

INTRODUCTION

On October 23, 1998, MN FACE investigators were notified of a farm work-related fatality that occurred on October 10, 1998. The county sheriff's department was contacted and a releasable copy of their report of the incident was obtained. Although a site investigation was not conducted, the detailed police department report, which included a transcript of their interviews that were conducted at the incident site and copies of their photographs taken at the incident site, provided specific and comprehensive information concerning this fatality. 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 harvesting beets in a farm field. The victim operated a farm tractor that was pulling a machine called a beet lifter that was seven years old. The beet lifter was powered by the tractor's power-take-off and was pulled through the field to harvest beets. The beet lifter extracted beets from the ground and used a conveyor system to raise the beets high enough so they could be dumped into trucks that were used to haul them from the field. At times, especially when beets were removed from wet ground the mechanism that dug the beets from the ground would become clogged with dirt.

While the victim was harvesting beets, a portion of the beet lifter known as the grab rollers became clogged with clumps of dirt and mud. The victim stopped the tractor, disengaged the tractor's power-take-off and raised the beet lifter from the ground. Another worker who was in the field with a truck used to haul beets from the field drove to the location to assist in clearing the dirt from the lifter. They manually removed most of the dirt from the machine and then decided to engage the power-take-off to allow the lifter to clean itself of the remaining dirt.

After the victim engaged the power-take-off he dismounted the tractor while the lifter was operating. He walked to a location along one side of the machine and leaned over a rotating shaft to determine if the lifter was clear of dirt and operating correctly. The rotating shaft had originally been covered by a metal shield however for unknown reasons it had been removed

from the lifter and not been replaced. While the victim leaned over the rotating shaft, his jacket was caught by it and became tightly entangled in the machine. The coworker noticed the victim become entangled, climbed onto the tractor and disengaged the power-take-off. He dismounted the tractor and called to the victim who was unresponsive. He used a two-way radio to notify family members of the incident. They placed a call to emergency personnel before proceeding to the field. Rescue personnel arrived at the scene shortly after being notified and pronounced the victim dead prior to freeing him from the shaft of the beet lifter.

CAUSE OF DEATH

The cause of death listed on the death certificate was multiple trauma due to farm implement accident.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: 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 machines such as the beet lifter in this incident. The workers engaged the power-take-off to clear the lifter of dirt, however, the lifter should have been stopped after operating for a short period of time and before the victim dismounted the tractor. If the power-take-off had been disengaged before the operator dismounted from the tractor, this fatality would have been prevented.

Recommendation #2: All equipment shields and guards should be kept in good condition and in place.

Discussion: Shields and guards protect workers from moving components that can cause serious injury or death. During this investigation, it was learned that the beet lifter was originally equipped by the manufacturer with a shield that covered the horizontal shaft in which the victim became entangled. However, it could not be determined when the shield was removed or who removed it. Whenever shields are removed from equipment to perform necessary maintenance or repairs, they should be properly reinstalled before the equipment is used. Also, damaged

shields and guards should be immediately repaired to provide workers adequate protection from moving machine components.

Recommendation #3: Operators should not wear loose-fitting clothing near 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 well-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. This recommendation is a general safe work practice that should always be followed by operators of machines whenever the risk of entanglement exists.

REFERENCES

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

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