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

SUBJECT: MN FACE Investigation 06MN009
Farmer Dies After He Became Caught In The Rollers of A Corn Picker

SUMMARY

A 27-year-old male farmer (victim) died after he became caught in a corn picker. He used a tractor and a pull-type corn picker to pick a field of corn. The power-take-off (PTO) driven corn picker was hooked to the tractor's drawbar and a wagon was hooked to the corn picker.

One feature of the corn picker was a husking bed that consisted of several pairs of hard rubber rollers. The rollers are similar to the rollers of an old-fashioned clothes wringer and operate on the same principle. As ears of corn pass over the husking rollers, the rollers grasp the husk of the ears of corn and remove the husk from the corn.

The victim drove the tractor pulling the corn picker and wagon to a cornfield near his farm place. While he operated the tractor and corn picker, he apparently noticed a problem with the corn picker and stopped the tractor's forward movement to investigate. After he stopped the tractor, he dismounted from it. The tractor engine was left running and the power-take-off was not disengaged. He walked to the area between the back of the operating corn picker and the wagon. For unknown reasons he reached into the area near the husking rollers and apparently the sleeve of his coat became caught between two of the rollers. He may have reacted by placing his other hand and arm in the area of the husking rollers which resulted in his other arm also becoming caught in the rollers. The rollers continued to pull his arms into the machine and resulted in his neck and chest being pulled tightly against the frame of the corn picker.

A neighbor noticed the tractor and corn picker in the field. He could hear the tractor running but after it remained in the same spot longer than what he considered a normal stop, he walked to the field to investigate. He found the victim caught in the corn picker. He used his cell phone to place a call to emergency personnel. Rescue personnel arrived at the scene shortly after being notified. They pronounced the victim dead at the scene prior to freeing him from the picker. MN FACE investigators concluded that, in order to reduce the likelihood of similar occurrences, the following guidelines should be followed:

- operators should, whenever possible disengage the power-take-off before dismounting from a tractor;

- operators should observe and follow all applicable safety precautions when operating PTO-powered equipment;
- operators should never reach into any machine while it is running;
- operators should turn off the engine and remove the key before dismounting a tractor; and
- operators should not wear loose-fitting clothing near operating machines.

INTRODUCTION

On February 20, 2005, MN FACE investigators were notified of a work-related fatality that occurred on February 16, 2006. The county sheriff's department was contacted and a copy of their report and pictures of the corn picker involved in this incident was obtained. The report and pictures of the corn picker provided a detailed description of this incident. A site investigation was not conducted by a MN FACE investigator. 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 and a pull-type corn picker to pick a field of corn. Although this incident occurred during the winter in Minnesota, mild weather and below normal snowfall resulted in the field being covered by only 3-5 inches of snow. The small amount of snow cover was not enough to interfere or hinder normal operation of the tractor and corn picker in the cornfield. The tractor and the two-row corn picker were each approximately 35 years old and had been manufactured in the early 1970's. The power-take-off (PTO) driven corn picker was hooked to the tractor's drawbar and a wagon was hooked to the corn picker.

The primary features of the corn picker were two pairs of snapping rollers, a husking bed that consisted of several pairs of hard rubber rollers and an elevator that transferred the ears of corn to the wagon hooked to the back of the picker. The snapping rollers were arranged at the front of the corn picker such that as it was pulled through a cornfield, one row of corn stalks entered each pair of rollers. The rollers of each pair of snapping rollers rotated toward each other and as the stalks entered the narrow gap between the rollers, the stalks were pulled through the rollers. Since an ear of corn is too large to pass between the closely spaced rollers, it is stripped from the stalk and transferred into the corn picker where it moves toward the husking rollers.

The husking rollers are similar to the rollers of an old-fashioned clothes wringer, and operate on the same principle. The rollers of each pair of husking rollers nearly contact each other as they rotate toward each other. As the ears of corn pass over the husking rollers, the rollers grasp the husk of the ears of corn and pull the husk from the corn. After crossing the husking bed, the ears of corn fall into a hopper at the base of the elevator and are then carried up the elevator of the picker and transferred to the wagon hooked to the back of the picker.

The victim drove the tractor pulling the corn picker and wagon to a cornfield to pick a wagon full of corn. The ear corn was used to feed a small herd of cows. The corn was picked on an as needed basis meaning that the victim would pick enough to feed his cows for several days or more and then at a later date when he need more corn to feed his cows, he would pick additional corn from the field. While the victim operated the tractor and corn picker in the field, he apparently noticed a problem with the corn picker and stopped the forward movement of the tractor to investigate.

After the victim stopped the tractor, he dismounted from it. The tractor engine was left running and the power-take-off was not disengaged. The victim walked to the area between the back of the operating corn picker and the wagon. He may have tried to clear something from the bed of husking rollers. When he reached over the frame of the picker and into the area near the husking rollers, apparently the sleeve of his coat became caught between two of the closely spaced rollers. He may have reacted by placing his other hand and arm in the area of the husking rollers which resulted in his other arm also becoming caught in the rotating rollers. The rollers continued to pull his arms further into the machine and resulted in his neck and chest being pulled tightly against the frame of the corn picker.

A nearby neighbor who was working with several horses noticed the tractor and corn picker in the field. He could hear the tractor and corn picker running but after it remained in the same spot longer than what would be considered a normal stop, he walked to the field to investigate. He found the farmer caught in the husking rollers of the corn picker and immediately used his cell phone to place a call to emergency personnel. Rescue personnel arrived at the scene shortly after being notified. They pronounced the victim dead at the scene prior to freeing him from the corn picker.

CAUSE OF DEATH

The cause of death listed on the death certificate was traumatic asphyxia.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Operators should, whenever possible disengage the power-take-off before dismounting from a tractor.

Discussion: Entanglements in power-take-off shafts and rotating machinery components can be prevented if a tractor's power-take-off is disengaged before operators dismount from the tractor. This may not always be possible, as in situations where a tractor is used to power a "stationary" machine such as a forage blower positioned along the side of a silo and used to blow chopped hay, corn or other forage to the top of and into the silo. However, it should always be done when the tractor is hooked to and operating a portable machine, such as the corn picker associated with this incident.

A general safe work practice that operators should follow is to disengage the power-take-off whenever possible before dismounting from a tractor. In addition, if other workers are in the immediate area of a PTO driven machine while the machine is operating, they should be

informed to at all times, stay away from any and all operating equipment while it is operating. They should be informed and trained to not approach, enter or climb onto any machine while it is operating and to only do so when the operator has stopped the machine and all moving components have come to a complete stop.

Recommendation 2: Operators should observe and follow all applicable safety precautions when operating PTO-powered equipment.

Discussion: When operating PTO-powered equipment, the operator should observe and follow all applicable safety precautions. The PTO should be disengaged and the tractor engine shut off before dismounting from the tractor for any reason other than as noted in Recommendation #1 for stationary machines. These precautions provide the operator three-way protection: (1) from shaft rotation; (2) from moving machine parts; and (3) from the unexpected engagement of power by another person when an operator is cleaning, servicing, adjusting, or repairing the equipment. Moving machinery parts present hazards that may result in entanglement in the equipment. The operator should wait for all machine movement to stop before cleaning, servicing, adjusting, or repairing the equipment. If the PTO had been disengaged and the tractor engine stopped before the victim of this incident dismounted from the tractor, this fatality would have been prevented.

Recommendation #3: Operators should never reach into any machine while it is running.

Discussion: Virtually all farm machines are designed to perform specific tasks or processes. These processes may consist of a series of high speed operations such as grinding, cutting and crushing of crop residue material by a machine when crops are harvested. These operations require a large amount of energy or power that is transferred from a tractor engine or other engine to the machine. This transfer of power is accomplished through various mechanisms including rotating shafts and rollers and/or a combination of belts and pulleys. As a result of rotating shafts and other components while machines are running, workers are exposed to very hazardous situations if they attempt to service, repair, unplug, or feed material into a machine while it is operating. For example, corn pickers like the one associated with this incident, have rollers that remove the ears of corn from the stalks by pulling the stalks through the machine. Another set of rollers that operate similar to the rollers of a washing machine ring remove the husks from the ears of corn. It was in these rollers of the corn picker that the victim became caught and fatally injured. If the corn picker had been stopped before the victim attempted to perform any work on it, this fatality would have been prevented.

Recommendation #4: Operators should turn off the engine and remove the key before dismounting a tractor.

Discussion: The potential for injury or death, due to entanglement, can be virtually eliminated by stopping the engine and whenever possible, removing the ignition key before operators dismount from tractors. Stopping the engine and removing the key provides protection: from power-take-off shaft entanglement; entanglement in moving machine parts; and 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 #5: 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.

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