

FACE INVESTIGATION

SUBJECT: Farmer Dies After Becoming Entangled in Unguarded PTO Unit on Corn Sheller

SUMMARY: A 68-year-old male dairy farmer (the victim) died after becoming entangled in the PTO driveline of a portable corn sheller. The sheller was connected to a tractor equipped with a power take-off (PTO) stub, which powered the drive line of the sheller. The victim was working with his two sons and a grandson in a farmyard, shelling corn. He had warned family members about the hazard of contacting the moving parts of PTO-operated equipment, and usually took precautions to avoid being caught in the rotating equipment. Immediately before the incident, the victim was standing next to the sheller, feeding corn in, when a cob got jammed in the sheller. When he tried to unjam the machine with his hand, it was caught and pulled by the drive belt on the sheller. The victim moved back to pull his hand out, causing his coat hem to touch the unguarded PTO driveline. The coat fabric was caught by the driveline, and the victim was pulled against the driveline shaft. His son heard a noise, and looked in the direction where the victim had been working. He saw his father entangled in the machine and sent the victim's grandson to call for emergency services. The son cut away the clothing to free the victim from the driveline, and started CPR. Emergency vehicles arrived, and continued CPR services. The victim was transported to a hospital where he was pronounced dead on arrival. The FACE investigator concluded that, to prevent similar occurrences, farm machine/equipment operators should:

- ! identify rotating or moving machinery/equipment components, such as PTO drive lines, and ensure that appropriate guards are installed**
- ! observe and follow all applicable safety precautions when operating machinery driven by tractor power take-off equipment, including disengaging the PTO and stopping the tractor engine before approaching the machinery**
- ! avoid wearing clothing that is loose-fitting, torn or ragged, or has portions that could be caught by moving machine parts and lead to entanglement**

In addition, agricultural businesses should:

- ! include safety management as an integral part of their business operation**

INTRODUCTION:

On October 8, 1995, a 68-year-old male farmer died of injuries he received when his clothes were caught and wrapped around the unguarded drive shaft of a corn sheller. The Wisconsin FACE field investigator was notified by the Wisconsin Department of Industry, Labor & Human Relations, Workers Compensation Division, on November 3, 1995. On May 29, 1996, the field investigator conducted a brief interview with the victim's wife. The FACE investigator also obtained the death certificate, the sheriff's and coroner's report and the state climatologist's weather report of the day.

The site of the incident was a crop farm purchased by the victim about thirty years before the incident. He had

raised corn as a cash crop. He had retired from his job at a heating and plumbing contracting company several years before the incident, but continued to operate the farm with his son. The victim had not received any formal training on operating farm equipment, but learned through on-the-job training. There were no written safety policies or procedures for the farm activities. He had verbally warned family members about the hazard of contacting the rotating drive shaft of the grain auger, and would usually use a stick as a pushing device to avoid contacting moving parts of farm machinery. It is unknown if there had been fatalities on the farm before the incident.

INVESTIGATION:

A description of the farm property was unavailable to the FACE investigator. The equipment involved in the incident included a corn sheller connected to a tractor equipped with a power take-off (PTO) stub shaft, which powered the sheller. The victim was working with his two sons and a grandson in a farmyard, shelling corn. Immediately before the incident, the victim was standing next to the sheller, feeding corn in, when a cob got jammed in the sheller. When he tried to unjam the machine with his hand, it was caught and pulled by the drive belt on the sheller. The victim moved back to pull his hand out, causing his coat hem to touch the unguarded PTO driveline. The coat fabric was caught by the driveline, and the victim was pulled against the driveline shaft. His son heard a noise, and looked in the direction where the victim had been working. He saw his father entangled in the machine, and sent the victim's grandson to call for emergency services. His son cut away the clothing to free the victim from the driveline, and started CPR. Emergency vehicles arrived, and continued CPR services. The victim was transported to a hospital where he was pronounced dead on arrival.

CAUSE OF DEATH: The death certificate listed the cause of death as multiple traumatic injury.

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Farm machine/equipment operators should identify all rotating and belt-driven machinery components, and ensure that appropriate guards, recommended by the manufacturer or dealer, are installed.

Discussion: In this incident, a drive belt and a rotating drive line were exposed during the operation of the corn sheller. It is unknown if the sheller was originally fitted with guards, but the farmer had identified both hazards and warned others against contacting the moving parts. If retrofit guards had been installed over the exposed belt and drive line, the incident may have been avoided. To prevent installation of an inadequate guard, machine/equipment owners should consult with the manufacturer or dealer before installing any guard.

Recommendation #2: Farm machine/equipment operators should observe and follow all applicable safety precautions when operating, maintaining or repairing machinery driven by tractor power take-off equipment, including disengaging the PTO and stopping the tractor engine before approaching the machinery.

Discussion: Here, the victim was trying to unjam a corn sheller by poking a lodged cob with a stick. When working with PTO-driven equipment, the PTO should be disengaged and the tractor engine shut off before

approaching the equipment. These precautions give protection from contact with the moving machine parts and from the unexpected engagement of power when an operator is cleaning, servicing, adjusting, or repairing the equipment. If the PTO had been disengaged and the tractor engine stopped before the victim approached the sheller, this fatality would have been prevented.

Recommendation #3: Farm machine/equipment operators should avoid wearing clothing that is loose-fitting, torn or ragged, or has portions that could be caught by moving machine parts and lead to entanglement.

Discussion: When working around equipment, particularly rotating drive lines, workers should wear well-fitting clothing that is free of drawstrings, tabs and loops, loose threads or flaps of cloth that could be caught by a machine part. The victim in this incident was wearing a loose-fitting coat. The incident might have been prevented if the victim's clothing was more form-fitting.

Recommendation #4: Farm business operators should include safety management as an integral part of their business operation.

Discussion: Components of an effective safety management system include a written safety program, hazard analysis and control, training programs and safety committees. Each of these components should be developed to meet the specific needs of individual businesses, and be incorporated into the business operating plan. The financial cost of implementing the program may be considered expensive, but the business investment would prevent fatalities and serious injuries. In this case, the entanglement would have been prevented by using equipment that was properly guarded. Although the practice of purchasing and using older-model equipment without guards may be regarded as acceptable in small agricultural businesses, the hazard of entanglement is present and should be avoided.

REFERENCES

Safety Management on the Farm, Mark A. Purschwitz, 1996, Department Bulletin of University of Wisconsin-Madison College of Agricultural and Life Sciences, Madison, WI