

MIFACE INVESTIGATION REPORT: #08MI128

SUBJECT: Farmer Died When Portable Elevator Fell Onto Him

Summary

In the fall of 2008, a 68-year-old male farmer died when a portable farm elevator fell onto him as he was pulling it away from an ear corn bin with a 7 HP lawn tractor. He had attached a chain to the elevator's axle and to the rear axle of the lawn tractor. There were approximately two bushels of ear corn at the top of the elevator. As he was moving the elevator, the top of the elevator fell and struck his back and head. The impact forced him forward on the tractor seat and pinned him against the steering wheel and gearshift lever. When his spouse heard the lawn tractor running for a longer period than usual, she left the house to check on him. She found him pinned against the wheel. She checked for a pulse and found him deceased. She called emergency response, and when they arrived, the decedent was declared dead at the scene.



Figure 1. Elevator position at time of incident

RECOMMENDATIONS

- Agricultural operators should develop and implement safe move/transport work practices for portable elevators.
- A farm safety plan should be established for the agricultural operation that includes work rules such as how to inspect and transport/move portable equipment.

INTRODUCTION

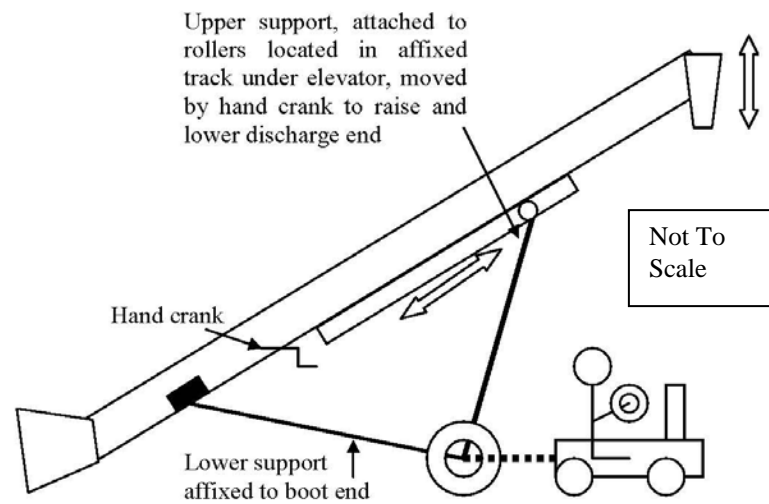
In the fall of 2008, a 68-year-old male farmer died when a portable farm elevator fell onto him as he was pulling it away from an ear corn bin with a lawn tractor. MIFACE was notified of this fatal incident by a newspaper clipping. On July 7, 2009, the MIFACE researcher interviewed the decedent's spouse at the farmstead. During the course of writing this report, the police report, death certificate, and the medical examiner's death scene investigation report were reviewed. Pictures used in Figures 1, 2, and 3 were taken by the responding police agency at the time of the incident. The pictures used in Figures 4, and 5 were taken by the MIFACE investigator at the time of the site visit. Pictures have been modified to remove identifiers.

The decedent was a retired farm laborer. While employed, he maintained his own beef cattle operation and was in the process of acquiring swine to supplement the cattle operation. His spouse stated that she and her husband had owned the family farm for a number of years. The decedent and his son worked on the farm every day, although his son had another job off the farm. At the time of the incident, the decedent had 50 to 60 head of cattle. The decedent rented 22 acres to grow ear corn and 24 acres to grow hay. The decedent ground the ear corn used for the beef cattle operation.

His spouse stated that to her knowledge, the decedent had not received any safety training nor had he attended safety training provided by MSU Extension or another agency. He did not have a farm safety program.

INVESTIGATION

The decedent was in the process of moving the 30- to 35-foot-long, 800-pound portable elevator from one ear corn crib to a second crib. According to his wife, the decedent's usual tractor of choice to move the elevator was the lawn tractor. His son had mentioned to the decedent that he wanted the decedent to wait for him until he got home from work, and together they would unload the ear corn and move the elevator. The decedent had used the lawn tractor for years and was very familiar with its operation.



Drawing 1. Position of decedent under raised discharge chute, chain attachment points

The portable elevator had also been used by the decedent for many years. A track was located under each of the long sides of the elevator frame. In the track was a roller, which

was part of a support (upper support) post. The base of the post was welded to the undercarriage wheel axle (See Figures 3 and 5, and Drawing 1). Also welded to the axle was the base of a lower support. The top of the lower support was affixed to the elevator frame near the input end and was free to rotate about its attachment point. The elevator was raised and lowered by a hand crank connected to a cable, which moved the upper support's roller along the track.

The decedent had done some errands that morning. He arrived home, and between 9:30 and 10:00 a.m., he told his wife he was going to move the portable elevator. While his wife was working on tasks inside the home, the decedent went to the storage shed and removed the lawn tractor. He drove it a short distance to the ear corn bins. He attached a chain to the undercarriage of the elevator and to the rear axle of the lawn tractor (Figures 2 and 3). The grass-covered ground was uneven. With approximately two bushels of ear corn weighing 140 pounds at the top (discharge area) of the elevator, he began to pull the elevator away from the ear corn bin (Drawing 1).

At noon, his wife heard the lawn tractor running and did not think anything was wrong. The tractor continued to run for another ten minutes. She thought that it was unusual for the lawn tractor to run that long just to move the portable elevator. When the decedent did not come into the house, she went outside to check on him. She found him seated on the lawn tractor under the collapsed portable elevator. The lawn tractor was still running and in reverse gear. The driver's side rear wheel was spinning and was partially buried in the loose soil. There was another divot in the ground near the elevator's wheel.

She turned the lawn tractor off. The impact of the portable elevator falling onto the decedent's body forced him forward on the tractor seat, pinning his upper body against the steering wheel and gearshift lever. His left arm was resting on the steering wheel. The lawn tractor's gear pattern was in an "H" pattern; reverse in the upper left of the "H" and first gear in the lower left of the "H" (Figure 4). It is hypothesized that the force of the elevator



Figure 2. Chain attached to rear axle of tractor

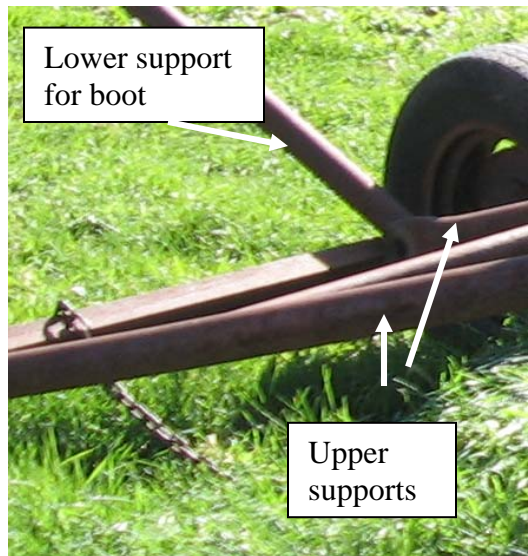


Figure 3. Chain attachment to elevator wheel undercarriage

striking him and moving him forward moved the gearshift lever from first gear to reverse gear. As this was an un-witnessed event, it is unknown precisely why the elevator collapsed. His wife checked on his status and found him cool to the touch. She indicated to the MIFACE researcher she knew he was deceased. She immediately called 911 and neighbors for assistance. Emergency response arrived and the decedent was declared dead at the scene.

CAUSE OF DEATH

The cause of death as listed on the death certificate was blunt force trauma to head, neck and back. No autopsy was performed.



Figure 4. Gearshift pattern of tractor

RECOMMENDATIONS/DISCUSSION

- Agricultural operators should develop and implement safe move/transport work practices for portable elevators.

Agricultural operators should develop and implement safe work procedures to move/transport the elevator from one location to another. The work procedure should include:

- Use appropriate equipment to move the elevator.* The decedent had available to him a tractor equipped with a four-post ROPS frame and canopy, which if used, would have prevented the elevator from striking him, even if he had improperly positioned himself under the raised elevator. The lawn tractor was *not equipped* with a ROPS frame and was not designed to perform this task (Figure 5).
- Ensure elevator is empty prior to transport.* The top heavy elevator had the extra weight of about two bushels of ear corn at the high top end, which may have contributed to a possible upend event and resulting elevator collapse. Although cable or winch failure was not a factor in this incident, operators should be made



Figure 5. Lawn tractor involved in incident

aware that any extra weight from product in the elevator may also produce excess strain on the lift cables, which could cause them to fail.

- c. *Ensure elevator is in a locked “full down” position prior to transport.* Moving an elevator in a raised position will increase the potential for an injury to occur, due to its instability in a raised position. Always lower the equipment and lock it into place when appropriate.

- d. *Use proper hitching techniques and proper attachment points.* Proper hitching involves using the agricultural tractor’s draw bar, not the tractor’s axle or the three-point hitch arms or crossbar (See Figure 6). The three-point hitch crossbar in Figure 6 is also known as a draw bar, but should not be confused with the tractor’s stationary draw bar, which is the lowest stationary hitch point. Using the crossbar between the arms of the three-point linkage is not advised due to its ability to change hitching height. **Operators**

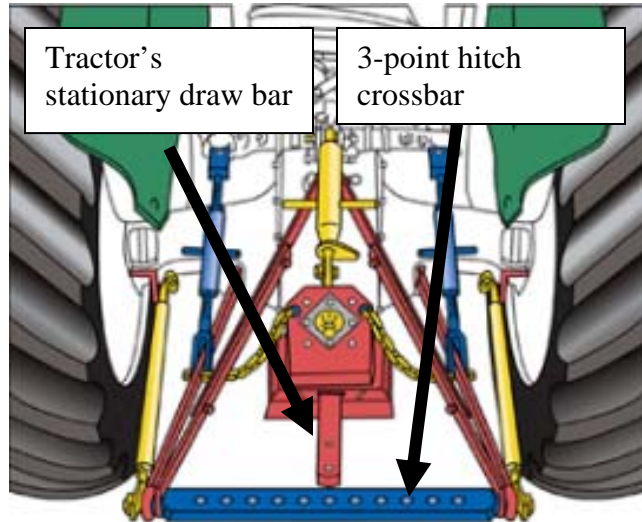


Figure 6. Three-point hitch components. Photo courtesy of Speeco.

http://www.speeco.com/images/tph_thumb.jpg

should never attach a chain to the axle of the pulling unit or to the axle of the unit being pulled. In this incident, the boot (or ground end) should have been used as the hitching point after the elevator was lowered and locked into position. If an attachment point for an older piece of equipment is not present, a solid metal tow bar specific to the equipment could be farm made and used to assist with towing using the agricultural tractor’s draw bar.

- e. *Do not permit any operator to be positioned under a raised elevator during transport.* If an operator is under the raised elevator, he/she cannot observe any problems with the elevator that may occur during transport. The decedent used a chain of insufficient length which caused him to be in the collapse zone of the elevator as he was moving it. Raised equipment can collapse unexpectedly, as in this incident, and the operator cannot take evasive action to minimize injury.

- A farm safety plan should be established for the agricultural operation that includes work rules such as how to inspect and transport/move portable equipment.

There is no legal requirement in Michigan for a written safety plan in agriculture. A written safety plan can help identify factors that can contribute to an injury, illness, or fatality. In some fatal work-related events, there is a single cause of the fatality. More commonly, as in this tragic incident, a combination of factors contributed: his location

under the elevator, the choice of pulling unit, the hitch points, transporting the elevator in a raised position, and the load at the top of elevator.

MIFACE recommends a written safety plan. Such a plan would identify the safety and health hazards for the farm, so hazard controls could be developed. A safety plan which is communicated to all who work on the farm would help raise awareness of safety issues and promote safe work practices. Additional benefits include increasing work efficiency, and minimizing costs. If there are employees, a written farm safety plan might reduce worker compensation premiums. A safety plan should include work rules, such as how to inspect a piece of equipment and how to transport/move portable equipment. At the time of the incident, the condition of the cables was unknown, as were the tightness of the cable clamps and the number of turns of cable on the windlass. It is unknown if the cable condition, cable clamps and number of turns on the windlass were factors in the fatality.

Several resources are available for developing a farm safety plan. Examples include:

- The Michigan State University Extension Emergency Management website (<http://web1.msue.msu.edu/emergency/farmsafe.html>). The website includes links to general farm safety resources, farm equipment children's safety, animal safety, and chemical pesticide safety.
- The Michigan Farm Bureau's Agricultural Labor & Safety Services (ALSS) (<http://www.michfb.com/safety/alss>) has many farm-related safety topics, including farm hazard assessment checklists, emergency preparedness plans, and links to other farm safety issues.
- The Pacific Northwest Extension Universities (Idaho, Oregon, Washington) have developed a sample written farm safety and health program and a series of 15 fact sheets designed to help farm and ranch managers conduct employee training on health and safety topics. The sample program can be found and downloaded from the Internet: <http://www.cals.uidaho.edu/agsafety/frmsaf01.pdf> . The fact sheet series, which is both English and Spanish, can be purchased from the University of Idaho Extension Service by accessing their web site: <http://info.ag.uidaho.edu/catalog/detail.asp?IDnum=565>.
- The Texas Cooperative Extension Service has developed a sample farm safety inspection checklist encompassing barns and buildings, animal facilities, grain storage and handling facilities, farm shops, chemical storage and handling facilities, farm machinery, fuel storage and handling facilities, and the general farmstead. The checklist may be found on the Internet at: <http://agsafety.tamu.edu/CONDUCTING%20FARM%20SAFETY%20INSPECTI%20NS.pdf>

REFERENCES

- Farm and Ranch Safety Management, 4th Edition, Copyright 1994, Deere & Company, Moline, Illinois.
- Portable Auger Safety Manual. Farm and Industrial Equipment Institute (FIEI). 410 N. Michigan Ave., Chicago, IL. 60611, 1985. (Name change to Equipment Manufacturer's Institute in 1989).

- Michigan State University Extension Emergency Management website. <http://web1.msue.msu.edu/emergency/farmsafe.html>
- Michigan Farm Bureau, Agricultural Labor & Safety Services (ALSS). <http://www.michfb.com/safety/alss>
- Pacific Northwest Extension Universities (Idaho, Oregon, Washington). Developing a Safety and Health Program to Reduce Injuries and Accident Losses. <http://www.cals.uidaho.edu/agsafety/frmsaf01.pdf>
- Idaho University Extension. Fact Sheet Series: <http://info.ag.uidaho.edu/catalog/detail.asp?IDnum=565>
- Texas Cooperative Extension. Conducting Farm Safety Inspections. <http://agsafety.tamu.edu/CONDUCTING%20FARM%20SAFETY%20INSPECTIONS.pdf>

Key Words: Portable elevator, Struck By, Agriculture, Ear corn, Lawn tractor

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To improve the quality of the MIFACE program and our investigation reports, we would like to ask you a few questions about this report:

What was your general impression of this MIFACE investigation report?

Excellent 1	Good 2	Fair 3	Poor 4		
		Excellent	Good	Fair	Poor
Was the report...		1	2	3	4
Objective?		1	2	3	4
Clearly written?		1	2	3	4
Useful?		1	2	3	4
Were the recommendations ...		Excellent	Good	Fair	Poor
Clearly written?		1	2	3	4
Practical?		1	2	3	4
Useful?		1	2	3	4

How will you use this report? (Check all that apply)

- Distribute to employees/family members
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- File for future reference
- Will not use it
- Other (specify) _____

Thank You!

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Comments:
