MIFACE INVESTIGATION: #01MI058

SUBJECT: Farmer Run Over by a Tractor and/or Manure Spreader

Summary

Figure 1- Police Photograph

On July 7, 2001, a 58-year old male part-time farmer died from injuries sustained while spreading manure in a nearby vacant open field with rolling hills. It appears that just after cresting a hill with a full manure spreader, he stopped the tractor, perhaps to retrieve his hat that had blown off of his head. Leaving the tractor running, the front-end loader bucket in the raised position, he dismounted from the tractor. After the victim dismounted, the tractor began to roll down the hill. The sequence of events leading to the fatal injury is unknown. It appears that the victim was run over first by the rear tractor tire and subsequently the manure spreader. The victim's hat was located approximately 57 feet from where the victim was found, in the direction of the wind. No one saw the incident. When the victim did not return home, his wife went to look for him. When found, 911 was called. He was pronounced dead at the scene.

RECOMMENDATIONS

- All tractor operators should follow safe equipment shutdown procedures as described in the operator's manual.
- Equipment owners should maintain equipment in good operating condition.
- Equipment owners should ensure that all relevant manuals, such as an owner's and operator's manuals are available for each piece of equipment for the operator to consult for safe operating procedures, service/maintenance, and to ensure that the tractor size and capacity is appropriate for the implement being used.
- If unattended equipment begins to move, operators should remain clear of its path of travel and not attempt to remount until the equipment has come to a complete stop.

INTRODUCTION

On Saturday, July 7, 2001, a 58-year old part-time farmer was killed when he was run over by a farm tractor and/or manure spreader. On August 3, 2001, MIFACE researchers were informed of the farm work-related fatality by a newspaper article. On April 18, 2002, the MIFACE researchers interviewed the wife of the deceased, viewed the tractor and manure spreader and the site of the incident. During the course of writing the report, the autopsy results and police department report were obtained. The researcher also visited a farm equipment sales and repair establishment to gather information about the tractor and manure spreader.

INVESTIGATION

On Saturday morning, July 7, 2001, a 58-year old part-time farmer was hauling a loaded manure spreader to another location to spread the manure. The farmer had another job he worked at full-time. His side business was boarding horses. He had boarded horses since 1985, and was currently boarding 12 horses. The victim had a bad knee, and sometimes wore a brace on his knee. He was not wearing the brace on the day of the incident. His wife indicated that he normally sat down when riding the tractor (vs. a standing position).

The tractor was a Series 3000, Ford model CA 223C, built in 1975. He bought the tractor used. The victim did not have an operator's manual. He had been having trouble with the tractor. The tractor had stalled in a field behind the house a few days before the fatal incident. The victim changed the plugs and points on the tractor and the tractor worked as desired for the next two days. The tractor was rated at 45 PTO (power-take-off) horsepower.

Figure 2

Figure 3

The tractor did not have a PTO master shield. The tractor was equipped with a Ford Model 335 front-end loader. See Figure 2. The victim filled the New Holland Model 679 tandem axle manure spreader (Figure 3) with manure the night before the incident. The tractor horsepower recommended by dealer and manufacturer information for the manure spreader was 80-85 horsepower.

At approximately 6:30 a.m., the victim left the farm to spread the manure in a nearby open field. He traveled along a 2-lane paved road to the field.

The field was acreage of vacant property. It was rolling, and had a few mature trees and some scrub-type trees. The property was covered by tall grass approximately 2-3 feet high. He normally spread the manure in this field. He entered the field, crested the first major hill, and began to go down that hill. (Figure 4 – View from top of hill). Barely past the top of the hill, the police found his baseball cap. It is unknown why the victim got off of the tractor. When the victim dismounted from the tractor, he left the loader in a raised position, the tractor engine running, and the transmission placed in Neutral. Based on the position and injuries sustained by the victim and the marks on the victim's clothing, it is probable that he was first run over by the rear tractor wheel, and as the tractor continued down the hill, the manure spreader wheel. It is unknown if the parking brakes were set.

Figure 4

The victim spread the manure approximately every 2 months. It normally would take him approximately an hour round trip from his home to spread the manure at this location. When a couple of hours passed and the victim had not returned his wife attempted to reach him by cell phone. Unable to reach him, she went to the field to look for him. She found the tractor, still running with the manure spreader at a low point in the field (Figure 5). Police pictures taken at the scene indicate that the manure spreader was operating as the tractor and spreader proceeded to the base of the hill. Upon finding the tractor, she shut off the tractor using the keys in the ignition. She searched the field while calling out to her husband. She could not find him and there was no answer to her calls. Unsure of what happened to her husband (maybe walked home via another route, possible heart attack), she returned home and called some friends to help her find her husband. The friends and the victim's wife returned to the field to search for him. Walking along the path of matted weeds made by the tractor as it descended down from the top of the hill, she found her husband, approximately 200 feet from the final resting position of the tractor. 911 was called and emergency personnel declared the victim dead at the scene. The police report indicated that the tractor had two shift levers; one appeared to be engaged while the second shift lever was in the neutral position. The key was in the off position and the engine was off.

Figure 5 – Police Photograph

Since this event was unwitnessed, there are many possible scenarios describing the sequence of events that may have occurred. Some possible scenarios are described below:

Scenario 1. The victim's baseball cap blew off of his head. He wanted to retrieve the hat, and prior to dismounting, he did not set the parking brake, and dismounted from the left side of the

tractor. As he dismounted from the tractor to retrieve his baseball cap, the tractor began to move down the hill. The victim was unable to move out of the way of the rear wheel and was run over.

Scenario 2. The victim's baseball cap blew off of his head. He wanted to retrieve the hat, and prior to dismounting, he set the parking brake, and dismounted from the right side of the tractor. As he dismounted from the tractor, he accidentally unlocked the brakes by stepping on the brake pedals. The tractor began to move down the hill. The victim was unable to move out of the way of the rear wheel and was run over.

Scenario 3. The victim's baseball cap blew off of his head. The victim had dismounted from the tractor and was away from the tractor. On his way back to his baseball cap, the tractor began to move and he ran after the moving tractor, attempting to climb into the operator's seat. He may have stumbled and was caught by the rear wheel of the tractor.

Scenario 4. The manure spreader may not have been operating correctly and he may have dismounted the tractor to inspect or adjust the spreader. The victim could have dismounted either from the left or right as described in Scenarios 1 or 2.

It is unknown if the victim's "bad knee" may have played a role in this fatality. A knee brace was available and it provided stability for the victim's knee. On the day of the incident, the victim was not wearing his knee brace. He may have tripped upon entry or exit to the tractor due to his "bad" knee. The lack of the leg brace may have decreased his function, stability and mobility when climbing into or off from the tractor. The National Ag Safety Database (NASD) contains a topic area, "Farming with Disabilities" that contains publications from various sources that addresses health, safety and injury prevention for persons with functional impairments. NASD publication "Safety Tips for Farming with Lower Extremity (Leg or Foot) Limitations" is included in Attachment A. The article can also be downloaded from the Internet: www.cdc.gov/nasd/menu/topic/topic.html.

CAUSE OF DEATH

The cause of death as stated on the death certificate was multiple blunt force trauma. The results of all toxicological tests were negative.

RECOMMENDATIONS/DISCUSSION

- All tractor operators should follow safe equipment shutdown procedures as described in the operator's manual.

Tractors will roll downhill if parked on an incline without an effective braking device, and the vibration created by a running engine may increase the possibility of initiating the rolling motion. Tractor operators can prevent tractors from rolling by disengaging the transmission, shifting the tractor into neutral, locking the brakes and turning off the engine before dismounting. General shutdown procedures for a tractor are: disengage the PTO, lower equipment attachments

to the ground, place the transmission into neutral or park, set the brakes, turn off the engine and remove the key. Whenever possible, the tractor should be parked on level ground. In this instance, the victim dismounted from the tractor on a grade. If it is necessary to park on a grade, the tractor should be positioned at a right angle to the slope.

The victim did not lower the loader attachment on the tractor to the ground, which may have placed additional stress on the brakes/transmission's ability to keep the tractor in place on the slope. The victim appeared to have placed the transmission in the neutral or park position with the engine running. It is unknown if he set the parking brake. He may have assumed he was protected from the tractor's movement down the hill by placing the tractor in neutral. Even if the brakes were set and the transmission in neutral, the brakes may not have been able to "hold" the loaded manure spreader on the slope of the hill.

- Owners/operators should maintain equipment in good operating condition

The family indicated that the lever to lock the brakes on would sometimes catch and did sometimes disengage when the brakes were on. All machine components should be checked periodically to ensure that they are in proper working order. When servicing equipment, owners/operators or qualified service personnel should follow the recommendations provided in the manufacturer's operator/service manual for the equipment.

- Equipment owners should ensure that all relevant manuals, such as an owner's and operator's manuals are available for each piece of equipment for the operator to consult for safe operating procedures, service/maintenance, and to ensure that the tractor size and capacity is appropriate for the implement being used.

When the victim purchased the second- hand tractor, the seller did not provide an owner and/or operator's manual; a manual was not available for the manure spreader. The victim did not obtain them from a local dealership. These manuals contain useful safety, operating, servicing and maintenance information. Attachment B contains an order form with a toll-free telephone number to obtain any Hew Holland equipment manual.

The operator's manual for the Ford tractor could have been obtained from a New Holland dealership. The tractor had a rated 45 horsepower at the power take off. The manure spreader specifications recommended that a tractor with 80-85 PTO horsepower be used to ensure safe towing and operation of the manure spreader. Although the tractor could provide power to the manure spreader, the tractor capacity was insufficient according to dealer- supplied information to travel safely with adequate braking capacity with a fully loaded spreader of this size.

- If unattended equipment begins to move, operators should remain clear of its path of travel and not attempt to remount until the equipment has come to a complete stop.

One of the scenarios presented described that the fatal injury may have been caused while attempting to get on the moving tractor to stop it from continuing down the hill. Operators should not attempt to remount moving vehicles. In this case the tractor would not have caused any significant human or environmental damage. It should have been let go and retrieved once it came to rest.

REFERENCES

National Ag Safety Database (NASD). Topic Areas: Machine Safety (Tractors), Farming With Disabilities. Internet Address: www.cdc.gov/nasd/menu/topic/topic.html.

Safety News, Howard J. Doss, Agricultural Engineering Department, Michigan State University, "Tractor Operator Checklist". 2000/2001.
Internet Address:
www.egr.msu.edu/age/aenewsletter/sites/ae_news/safety_news/safety_news1_01.pdf

ATTACHMENT A

Safety Tips for Farming With Lower Extremity (Leg or Foot) Limitations

The Easter Seal Society

Leg and foot problems include: limitations that have resulted in decreased strength or function due to toe or foot amputations; below-knee or above-knee amputations; or tendon, muscle, nerve, or joint damage. The following is a list of safety tips that have been provided by farmers with lower extremity impairments:

1. To prevent falls, increased fatigue or further degeneration, outdoor mobility aids should be considered when maneuvering around rough rural terrain. These aids include: manual, electric, electric/gasoline-powered wheelchairs, all-terrain vehicles, golf carts, and riding lawn mowers. Foot guards and modifications to controls for all-terrain vehicles and lawn mowers should be considered if you lack sensation and/or control in your legs or feet. Head gear should be worn when operating ATVs.

2. Special cane tips for snow, ice, and loose gravel should be considered.

3. When mounting and dismounting from a tractor, you should start out with your stronger leg.

4. To accommodate lost abilities in mounting and dismounting, farm machinery can be adapted by adding a manlift, non-slip steps, wider steps, additional steps, and hand-holds.

5. To accommodate for lost strength or function of your leg or foot when operating foot controls on a tractor, you can adapt controls by constructing hand controls.

6. Direct access to livestock should be avoided if possible (or approached with extreme caution) due to the unpredictable nature of livestock. Worksite accommodations to eliminate direct access include: fence line feeders; automated feed systems; using round bales; raised decks for hogs; or having another person perform the potentially dangerous tasks.

7. If you use a prosthetic device, jumping off a tractor is not recommended. You might break the prosthesis, re-injure yourself or suffer an additional injury to your legs or feet.

8. Labor-saving devices such as automatic gate openers and automatic hitching devices will help in reducing further degeneration of impaired extremity.

9. Modifications to tractor seats such as better cushions or installation of an independent suspension seat might be considered for an above-knee amputation or hip replacement to help provide more protection and shock absorption for the stump or hip joint.

10. If you have a hip replacement, tasks that require bending 90 degrees or more from the hip should be avoided. An all-terrain vehicle with a bench seat may be more appropriate than

one that requires you to swing your leg over the top of the engine when mounting or dismounting.

11. Walking through fields with weeds and knee-high vegetation can lead to potential falls or entanglements that could cause twisting of a joint. When walking out to the field to check on crops, it is recommended to follow the wheel tread marks that have been made by farm equipment or create a smoother path for safer ambulation.

12. For climbing over fences or walking on very unstable ground, it is sometimes recommended to lock the knee on a prosthesis to provide better stability.

13. Several improvements have been made to lower-extremity prosthetic devices to enhance comfort, reduce skin breakdown, save energy, and improve safety. These improvements include a "NSNA" (Normal Shape, Normal Alignment) socket for above-knee amputees; Flex-foot (an energy storing prosthesis); and a hydraulic knee. Consult a prosthetist to determine if any of these technologies would be appropriate.

14. To reduce fatigue or further degeneration of an affected extremity when performing tasks that require standing for long periods of time, a sit-stand chair or stool might be useful to relieve pressure without interfering with completing a task.

15. Any adaptations or modifications intended for use by an individual with a disability should be used by that individual only. Use of a modification or adaptation by another individual could result in an injury.

FOR MORE INFORMATION

For more information on general farm safety, contact Iowa State University's Cooperative Extension Office

NASD Review: 04/2002

The information shared is based on data gathered by the Easter Seal Society of Iowa's Farm Family Rehabilitation Management (FaRM) Program through financial support from the Injury Prevention Research Center at the University of Iowa Grant #R49\CCR703640-02 funded by the Center for Disease Control. No scientific research has been conducted to determine if the above tips or suggestions are safe or effective. The information shared is simply ideas shared by farmers affected by disabilities of the staff at the FaRM Program. For more information or clarification contact the FaRM Program at (515) 289-1933 or submit comments or questions to P. 0. Box 4002, Des Moines, Iowa, 50333.

ATTACHMENT B

1-800-635-4913

ORDER FORM

Date _____

Attn: _____

Name _____

Address _____

City _____

State _____ Zip _____ Phone _____

Check one ☐

Authorized Signature (of card holder) _____ ☐

Credit Card # _____ Exp. Date _____ ☐

☐

Dealer Order Only: *(Place order through the DCS Service Parts system to avoid an additional line item fee.)*

Authorized

Dealer Signature _____ Phone: (___) _____

Dealer Code _____ Zone _____ Fax: (___) _____

Dealer: If manuals are for resale, check box ☐

and provide sales tax registration no. _____ .

MANUAL NO.	QTY.	DESCRIPTION	PRICE EA. (U.S. $)	TOTAL AMOUNT
40991116	1	Service Publications Catalog	N/C	

MAKE CHECK OR MONEY ORDER PAYABLE TO:
New Holland North America, Inc.
20770 Westwood Drive
Strongsville, OH 44136

Total Order (U.S. $) $_____
Add Appropriate State or Provincial Sales Tax * $_____
Shipping & Handling $ 5.00**
04000000

GRAND TOTAL $_____

* Tax exempt customers must provide copy of tax exempt certificate.
** Does not apply to dealer orders.

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Example of an order form for a specific tractor/equipment operator's manual. Dealers can provide specific details for your piece of equipment.

MIFACE Investigation Report Evaluation

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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 regarding this report.

Please rate the following on a scale of:

Excellent	Good	Fair	Poor
1	2	3	4

What was your general impression of this MIFACE investigation report?

1 2 3 4

Was the report…

Objective?	1	2	3	4
Clearly written?	1	2	3	4
Useful?	1	2	3	4

Were the recommendations …

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)

- o Distribute to employees/family members
- o Post on bulletin board
- o Use in training
- o File for future reference
- o Will not use it
- o Does not apply to my operation
- o Other (specify) _____

Thank You!

Return to:
MIFACE
Michigan State University
Department of Occupational &
Environmental Medicine
117 West Fee Hall
East Lansing, MI 48824-1315

If you would like to receive e-mail notifications of future MIFACE work-related fatality investigation report summaries, please complete the information below:

Name: _____
e-mail address: _____

I would like to receive summaries for reports involving:

___ Construction ___ Agriculture
___ Manufacturing ___ All