

**TO: Director, National Institute for Occupational Safety and Health**

**FROM: Iowa FACE Program**

**SUBJECT: Farmer dies when a tree falls on him from a front end loader-- Iowa.**

**SUMMARY:**

A 61 year old male farmer working alone in his timber was killed while using a tractor equipped with a front end loader and a backhoe. He was using the machine to move logs and downed trees into position for cutting into firewood. He had cut down a large tree with multiple limbs and was carrying it with the loader when it apparently rolled off the bucket and a branch struck him in the face and neck area pinning him to the tractor. The tractor had no ROPS, nor was the man wearing any head protection. His wife found him in the tractor seat, with head and neck injuries and bluish complexion. The tractor was tilted to the side with the right rear wheel raised and the engine still running. His wife tried to rescue him by using the backhoe and bucket hydraulics, but in the process tipped the tractor over, throwing both of them clear of the machine. CPR was attempted by the wife and later by emergency personnel when they arrived, but it was unsuccessful, and the farmer was pronounced dead at the local hospital.

**RECOMMENDATIONS following our investigation were as follows:**

- 1. *Machines used for logging purposes should be fitted with 4-post ROPS or cabs.*
- 2. *Workers in logging operations should always wear a hard hat and other personal protective equipment.*
- 3. *Tractor front end loaders should not be used to lift logs unless the logs are secured to prevent them from rolling or sliding off.*

**INTRODUCTION**

On March 3, 1995 an Iowa farmer, aged 61, was killed on his farm while moving logs and trees with a tractor equipped with a front end loader and a backhoe. On June 5, 1995 the Iowa FACE Program was notified of the incident by the Agricultural Engineering Dept. of Iowa State University and began an investigation. Information for this case was gathered from the County Medical Examiner, the County Sheriff (who took photographs), a local newspaper, and a conversation with the victim's wife, who preferred we not make a farm visit.

The victim had been a life-long farmer and was recently retired from a maintenance position at a local factory. He and his wife farmed 130 acres with corn and soybeans, and referred to their acreage as a "hobby farm". The victim was working alone when the accident occurred.

The victim had worked with logs and trees on numerous occasions and was very familiar with the loader and backhoe. The factory where he recently retired was also the manufacturer of the backhoe he was operating at the time of his death.

**INVESTIGATION**

The victim was using a backhoe tractor to move and position logs for cutting into firewood. He started work at 1:30 P.M. and was working along the lane of his property at the edge of his

timber. He was using the front end loader of his backhoe tractor to position logs onto a pile for cutting into firewood. The ground was level, and there were no obvious environmental conditions that contributed to the accident.

The involved tree was a hardwood species approximately 40 ft. in length, with a cut base of ~18". It had ~12 large branches from 6-12" in diameter. The tops of the limbs had been cut off after it was felled, and there were no leaves since this was the beginning of spring. The victim apparently was trying to lift the tree at a suitable balance point placing the front end loader bucket under the tree. There were scars on the bark of the tree at one point, presumably where the bucket edges dug into the bark. The tractor was positioned perpendicular to the edge of the timber, adjacent to a pile of cut logs. It is assumed that the victim was trying to move the tree to this position for final cutting of the limbs.

While moving the tractor with the tree resting on top of the bucket, the tree shifted or twisted and fell off the bucket. As the tree fell over the tractor with its raised bucket, a limb 8-10" in diameter struck the victim in the left forehead, face, and neck regions.

At 3:20 a neighbor found the victim seated on the tractor, pinned under the tree limb, with a bluish complexion. The right rear wheel of the tractor was raised slightly off the ground, and the engine was still running. It is not known how long the victim was in this position before being found. The neighbor immediately told the victim's wife who called 911. The wife went to the tractor and engaged the hydraulics to the backhoe and bucket attempting to free her husband, when the tree shifted and the tractor rolled on its left side, throwing the victim and his wife to the ground. She was not injured but proceeded to resuscitate her husband.

An ambulance arrived at 3:45 P.M. Personnel continued CPR efforts but felt no pulse. Attachment of a heart monitor revealed a very weak pulse, however all efforts to revive the victim failed and he was pronounced dead at 4:30 P.M. at the local hospital.

## **CAUSE OF DEATH**

The cause of death from the Medical Examiner's Report was "multiple injuries due to a tree falling upon him." There was no autopsy performed.

## **RECOMMENDATIONS / DISCUSSION**

•**Recommendation #1** *Machines used for logging purposes should be fitted with 4-post ROPS or cabs.*

**Discussion:** A 4-post ROPS or full cab could have saved the victim's life. Falling limbs are always a hazard when working in and felling timber. ROPS with 4 posts provide protection from all sides and should be standard equipment for all machines used in commercial and also small-scale logging operations.

•**Recommendation #2** *Workers in logging operations should always wear a hard hat and other personal protective equipment.*

**Discussion:** Being struck by a heavy tree limb would likely have caused serious injury regardless of personal protective equipment. However, to lessen the severity of the injury, it is

important to wear a hard hat and other appropriate personal protective equipment in logging work at all times. The likelihood of being struck by falling limbs is great in logging situations and a hard hat has proven to reduce serious injuries.

•**Recommendation #3** *Tractor front end loaders should not be used to lift logs unless the logs are secured to prevent them from rolling or sliding off.*

**Discussion:** The flat edges of a raised front end loader do not provide adequate support for an irregularly shaped log or a tree with multiple limbs. A special bucket would be needed to hold the log in place and prevent it from falling down. Lifting and transporting an entire tree with its limbs in a front end loader is a dangerous task. It is very difficult to balance the tree on a loader bucket, especially when the tractor is moving. Other means of transportation should be used, such as dragging the logs or loading them on a trailer.

---

Wayne Johnson, M.D.  
Trauma Investigator (FACE)  
Institute for Rural & Environmental Health  
University of Iowa -- Iowa City, Iowa

---

Risto Rautiainen, M.Sc.Agr.  
Coordinator  
Great Plains Center for Agricultural Health  
Institute for Rural & Environmental Health  
University of Iowa -- Iowa City, Iowa