

***F***atality  
***A***ssessment and  
***C***ontrol  
***E***valuation Project

*Public Health*

*KY FACE #96KY088*

*19 September 1996*

***To:*** *Carl Spurlock, PhD, Director, Kentucky Injury Prevention and Research Center*

***From:*** *Tim Struttman, MSPH, Field Investigator, KY FACE Project*

***Subject:*** Farmer Killed in Tractor Rollover

***SUMMARY***

On August 22, 1996, a 75-year-old farmer was killed when the tractor he was operating rolled over onto him. He was using a 1979 IH Farmall 140, towing a flatbed wagon along the perimeter of a tobacco patch. As he turned left to proceed around the field, the left tractor wheels went over an embankment, causing the tractor to roll over. The victim was crushed under the rear wheel of the overturned tractor and died of traumatic asphyxia due to chest injuries. He was discovered by his son two hours after the incident when he did not return to the farmhouse for lunch. In order to prevent similar incidents, the KY FACE investigator concluded that:

- to provide protection for operators, tractors should be retrofitted with Roll Over Protective Structures (ROPS) and seatbelts.

**INTRODUCTION**

On 23 August 1996, KY FACE was notified by the Occupational Health Nurses in

Agricultural Communities (OHNAC) nurse of the death on 22 August 1996 of a farmer. An investigation was initiated and continued with a site visit on 5 September 1996, two weeks following the incident. Both the FACE investigator and an OHNAC nurse interviewed the deputy coroner, a fire department volunteer who responded to the 911 call, and the victim's son. An inspection of the tractor and the scene was made with the victim's son and the fire department volunteer; measurements and photographs of the scene and the tractor were taken. Copies of the coroner's report, the fire department report, the death certificate, and newspaper articles were obtained. The case was later discussed by telephone with the emergency medical services (EMS) personnel and with a tractor dealer and the manufacturer's Corporate Product Safety and Regulations Department.

## **INVESTIGATION**

This case was investigated because of its similarity with Case #94KY066 in that the tractors were identical and in both cases the tractor rolled over as the victim was turning right.

The victim had been a farmer all his life and was the minister of the local church. He owned 70 acres and leased 230 more. This year's tobacco crop was his sixty-first. The land was fairly flat, situated in a valley. In addition to six acres of tobacco, the victim also raised beef cattle and grew, baled and sold alfalfa hay.

He was thought to be in good health following mini strokes in 1991. They are not believed to have been a factor in the incident. Ten years prior, his cousin was also killed in a tractor rollover incident. According to his son, he had had only minor incidents causing injury in the past, and was considered an excellent tractor driver.

The equipment involved in the incident was a 1979 IH Farmall 140 which had been purchased new by the victim and his son in 1979. Visual inspection revealed it was in excellent condition, well maintained, with good brakes and clutch. The rear tires were filled to an appropriate level with calcium chloride, adding approximately 200 pounds to each wheel. Total tractor weight is estimated at 3400 pounds. The front and rear wheels were 45 inches center to center.

This model is a drop-bull gear tractor where the center of gravity is higher because most of the weight is above the center of the wheels. Also, this is the offset model where the engine is to the left and the steering wheel rod travels along the side of the engine, centered between the wheels; therefore the bulk of the weight is on the left side. To offset this, wheel weights and a heavy cast wheel are standard on the right wheel. According to the manufacturer, this returns the side-to-side center of gravity to within one inch of the center line between wheels.

The tractor had a 22-inch clearance below the axles. It suffered minimal damage in the rollover; the breather and exhaust pipe were torn off, the steering wheel was broken, and the fender was slightly bent. The tractor had the original wheels, which appeared to have plenty of tread left but many cuts in the rubber.

This small, 21-HP tractor is favored by tobacco growers because of the high clearance and the

offset steering to give full view down the rows when plowing. With this tractor, operators can look ahead while plowing instead of turning around to see where the cultivators have been. Rows are spaced 44 inches apart to accommodate the tractor and cultivators. Tobacco is usually cultivated twice per year using this type tractor in first gear, creeping along between rows, being careful not to veer from an arrow-like course and inadvertently damage the plants. Original cost of this four-cylinder gas-powered tractor was \$8,500, and approximately 64,000 were sold between 1958 and 1979. In 1979 production of this model ceased. It is estimated that 90 percent are still in use.

This tractor, like many others, was used for a variety of jobs other than cultivating tobacco. On the day of the incident, the victim had been driving the tractor, shuttling wagons of square-baled hay from the field to the barn. He had hired seven laborers for the day to harvest approximately 20 acres of hay. A crew was in the field bucking bales onto a wagon. When the wagon was full, a second tractor and wagon were filled as the first was delivered to the barn for unloading. The victim drove the IH tractor, pulling several loads to the barn.

At noon (ahead of schedule), the job was complete. Since the victim had intended to use the hired labor all day, he decided to check the tobacco to determine if it was ready to be cut. He proceeded westward on a bumpy dirt path between a field of feed corn and a 2-1/2-acre patch of mature tobacco. He turned right along the western border, paralleling a creek for a short distance, and then turned back eastward along a drainage ditch separating a second field (1-1/2 acres) of tobacco.

As the tractor turned right (eastward), in order to avoid crushing tobacco plants with the wagon, the victim drove a wide angle around the patch. The drainage ditch was dry with tall (5-6-foot) weeds obscuring the 30-degree slope into the 12-foot ditch. The left tires went into the ditch, causing the tractor to roll over, crushing the victim.

When the victim did not come back for lunch, his son went looking for him. Following a similar path on the second tractor, he came upon the victim under the tractor. He immediately went back to the area where the others had gathered for instructions and told one of the laborers to call 911. The volunteer fire department responded to the call first. The EMS received the call at 2:01 and arrived at the scene at 2:11. Using the second tractor, a John Deere 2355 driven by one of the farm laborers, a chain was attached to the rear tongue of the empty wagon, which had not rolled over with the tractor (its tongue twisted 180 degrees). The John Deere slowly pulled the wagon, which eased the tractor off the victim. As the tractor was lifted rescue workers pulled the victim from under the tractor. Once cleared from the area, the John Deere continued to pull the wagon, still attached to the tractor, which righted the IH 140. Airblocks to stabilize the tractor were available but not used in the extrication. The victim was removed from the scene at 2:20 pm. No autopsy was performed. Blood toxicology reports were negative.

## **CAUSE OF DEATH**

The cause of death was listed on the coroner's report as traumatic asphyxia due to crushing injuries due to farm accident/tractor overturned.

## **RECOMMENDATIONS/DISCUSSION**

**Recommendation #1:** To provide protection for operators, tractors should be retrofitted with Roll Over Protective Structures (ROPS) and seatbelts. Tractor owners should contact their county extension agent, equipment dealer or equipment manufacturer to see if retrofit rollover protection and operator restraint systems are available for their equipment. Such systems should be installed by the manufacturer or an authorized dealer.

**Discussion:** The tractor involved in this incident, manufactured in 1979, was not equipped with ROPS or a seatbelt, which protect the operator in the event of a rollover, and in this case might have prevented the operator being crushed by the tractor. ROPS first became available as optional equipment on farm tractors in 1971; tractors manufactured before 1971 generally were not designed to accommodate the addition of ROPS. In 1976, the Occupational Safety and Health Administration (OSHA) required employers to provide ROPS and seatbelts for all employee-operated tractors manufactured after October 25, 1976. In Kentucky, 94% of the farms do not have 11 employees and therefore do not fall under the OSHA requirements. Since 1985, as a result of voluntary agreements by tractor manufacturers, virtually all new tractors sold in the United States have been equipped with ROPS and seatbelts. A ROPS retrofit kit is available for the 1979 IH Farmall tractor involved in this incident.

## **REFERENCES**

Standard Number 1928.51, Subpart C, US Department of Labor, Occupational Safety and Health Administration, OSHA CD-ROM (OSHA A94-2), February 1994.

Bureau of the Census. 1992 Census of Agriculture: Vol. 1, Geographic Area Series, Part 17, Kentucky State and County Data. Washington, DC: Department of Commerce, Economics and Statistics Administration, 1992 (AC92-A-17).