INJURY UPDATE

*A Report to Oklahoma Injury Surveillance Participants**

July 31, 2001

Farming-Related Deaths in Oklahoma, 1998 - 2000

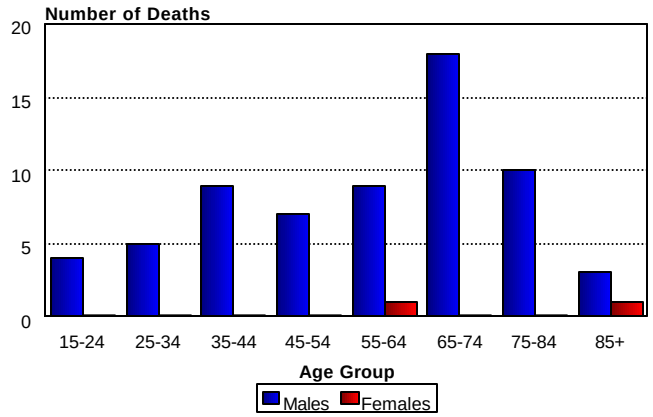
Work-related injuries continue to be a public health problem in the United States, accounting for more than 6,000 deaths per year (rate 4.5 per 100,000 workers). Among all industries, agriculture has the highest annual death rate. In 1997 alone, farming-related deaths accounted for 13% of all fatal work-related injuries nationwide (U.S. Department of Labor, 1998).

The Oklahoma State Department of Health Injury Prevention Service began a statewide, population-based occupational injury fatality surveillance program in July 1997. The Oklahoma Fatality and Control Evaluation (OKFACE) program is funded by the National Institute for Occupational Safety and Health (NIOSH). The goals of the OKFACE program are to monitor occupational deaths statewide, determine the epidemiology of fatal work-related injuries, and formulate and disseminate prevention strategies to those who can intervene in workplaces. In Oklahoma, a total of 309 work-related deaths were identified from January 1, 1998 through December 31, 2000 (average annual rate 6.5 per 100,000 workers). During the 3-year period, farming-related deaths were the leading cause of occupational deaths in Oklahoma, accounting for nearly one-quarter of all deaths. This report describes the epidemiology of these injuries.

A total of 67 farming-related deaths were identified from January 1998 through December 2000, averaging 22 deaths per year. Farming-related deaths accounted for 22% of all work-related deaths. The ages of farmers who died ranged from 17 to 92 years, with an average age of 58 years (median 63 years). Males accounted for 97% of deaths; only two females died in farming-related incidents. Twenty-seven percent of deaths occurred among males 65-74 years of age (Figure 1). Sixty-two farmers (93%) who died were white, one was African American, and one was Native American. Race was not known for 3 persons. Almost two-thirds (64%, 43/67) of farming-related deaths were related to crop farming, whereas 36% (24/67) were associated with livestock farming or ranching.

The leading causes of fatal farming-related events were machinery, traffic crashes, struck and/or crushed by an object, suicide, and animal-related incidents (Table 1). Other types of fatal farming-related incidents included falls from elevation, electrocution, and explosion.

Figure 1. Farming-Related Deaths by Gender and Age, Oklahoma, 1998 - 2000



*The INJURY UPDATE is a report produced by the Injury Prevention Service, Oklahoma State Department of Health. Other issues of the INJURY UPDATE may be obtained from the Injury Prevention Service, Oklahoma State Department of Health, 1000 N.E. 10th Street, Oklahoma City, Oklahoma 73117-1299, 405/271-3430 or 1-800-522-0204 (in Oklahoma). INJURY UPDATES and other IPS information is also available at www.health.state.ok.us/program/injury.

Of the fatal farming machinery cases, tractors were the most frequently used piece of farming machinery, accounting for 89% (33/37) of the deaths. Almost half of the tractor-related fatalities were associated with being run over by a tractor (45%, 15/33). Most incidents occurred when the victim fell or was thrown from a moving tractor and run over either by an attached implement or the tractor. Other common causes of tractor-related fatalities were tractor rollover/overturn (30%, 10/33), and being crushed or pinned between a tractor and an object (24%, 8/33). Other farming machinery fatalities resulted from hay baler incidents, hydraulic failure of farm trucks, and a farming shredder event.

Eighty-one percent (54/67) of farming-related deaths occurred on the day of the incident, 15% occurred within 1 to 14 days, and 4% took place between 50 and 130 days following the incident. The most commonly reported immediate causes of work-related deaths (multiple causes were possible) were head injuries (39%), chest/back injuries (37%), multiple traumatic body injuries (16%), suffocation (12%), and internal injuries (9%). Of persons with a known blood alcohol status (34), 6% had a positive blood alcohol level.

Farming-related incidents most commonly occurred from March through August with the peak in July (Figure 2). The time of incident was available for 57 cases; 68% of the incidents occurred between noon and 8:00 p.m. (Figure 3). The geographic distribution of farming-related deaths is shown in Figure 4.

Table 1. Causes of Farming-Related Deaths, Oklahoma, 1998 - 2000

Type of Incident	Number of Deaths	Percent
Agriculture Machinery	37	55%
Traffic Crashes	11	16%
Struck and/or Crushed by Object	6	9%
Suicide at Work	4	6%
Animal-Related Incidents	4	6%
Falls from Elevation	2	3%
Electrocution	2	3%
Explosion	1	1%
Total	**67**	**100%**

Figure 2. Farming-Related Deaths by Month of Incident, Oklahoma, 1998 - 2000

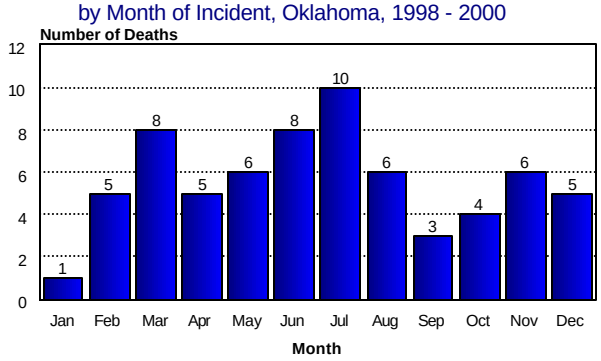
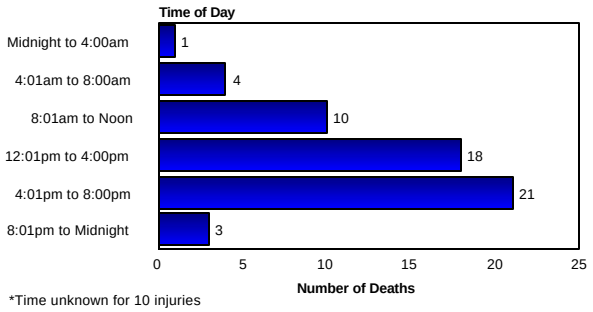


Figure 3. Farming-Related Deaths by Time of Day,* Oklahoma, 1998 - 2000

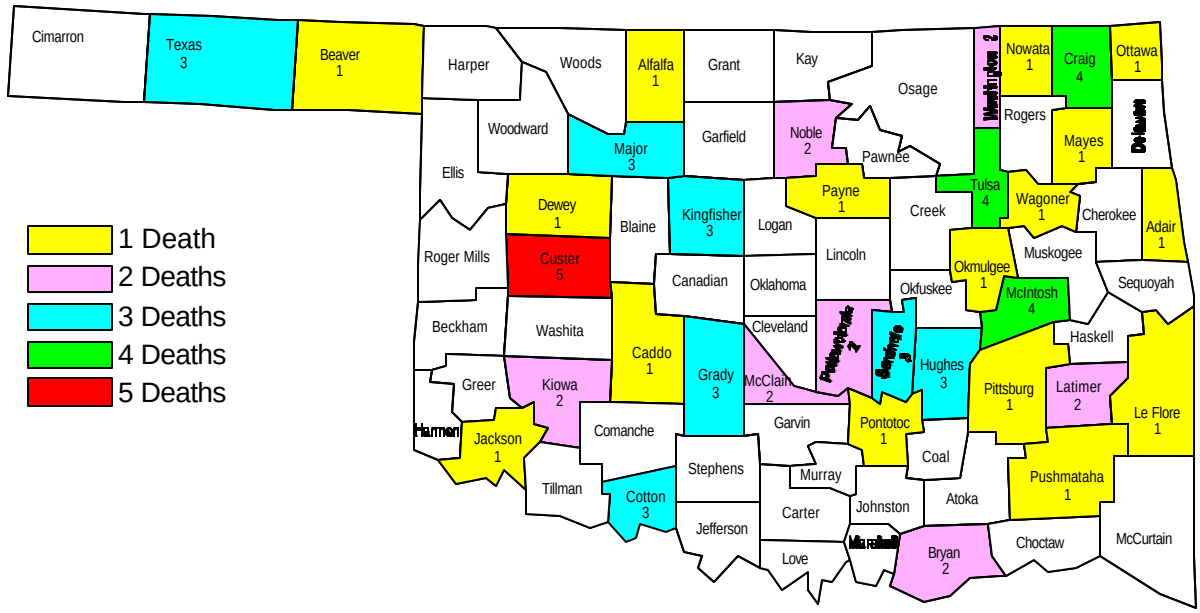


*Time unknown for 10 injuries

Case Briefs

- A 17-year old farmer on a tractor noticed there was a jam in the clutch assembly of the hay baler he was pulling. He got off the tractor and climbed on top of the baler to clear the jammed wheat straw by using his feet. He left both the tractor and the power take-off (PTO) running. The jam cleared, and the clutch put the PTO back into motion. The baler rollers suddenly started moving and trapped the farmer's leg inside the baler. The rollers and belts spinning around the hay started a fire. He died from crushing trauma to his internal organs.
- A 35-year old farmer was attempting to cut down a large tree using a tractor which was equipped with a box-blade with the blade up. The tree fell on the farmer and pinned him beneath it on the tractor. He died from suffocation.
- A 71-year old farmer standing next to his tractor put the tractor in gear. As he was trying to move the tractor just enough to attach an implement, the tractor ran over him. He died from chest trauma.

Figure 4. Farming-Related Deaths by County of Incident, Oklahoma, 1998-2000



- A 66-year old rancher was moving a large hay bale with a tractor equipped with a front-end loader; the bale was not secured. He backed up the tractor with the front-end loader raised high above the tractor. The tractor hit a dip and the bale fell out of the bucket of the front-end loader, pinning the rancher against the seat. He died from suffocation and internal injuries.

- A 63-year old rancher went out to round up cattle on a tractor. He was driving up a steep embankment when his tractor turned over on top of him. The farmer was found trapped beneath the overturned tractor with his head, neck, and trunk crushed by the tractor's seat and steering column.

- While working on the lift of his flat bed dump truck, a 72-year old farmer was killed by the hydraulic lift, which apparently malfunctioned. The hydraulic lift descended and crushed the farmer's head between the bed and the truck frame.

- While driving a tractor on a two-lane paved road, a 52-year old farmer was struck from behind by a one-ton truck. The tractor ran off the road, overturned, and pinned the farmer underneath it. The farmer's tractor was not equipped with tail lights or a slow moving vehicle placard. The available report had no information regarding the presence of rollover protective structures (ROPS) or a seatbelt.

- A 76-year old rancher had been unloading metal cattle fence panels out of a cattle trailer. He was found pinned against the inside of the trailer with several heavy panels lying against him. The panels put enough weight against his chest to suffocate him.

- A 51-year old farmer was preparing to unload grain from an 18-wheel grain truck at a grain elevator. He stepped out of the truck to manually crank open a metal-framed tarp that covered the grain. As the tarp was raised, it came in contact with electric lines overhead with approximately 7,500 volts. The electric current threw the farmer away from the truck, and he died from electrocution.

- A 58-year old rancher was working on his barn, screwing sheet metal to the top of the barn. He was approximately nine feet above a concrete floor when he fell and struck his head on the floor.

- A 69-year old horse breeder/farmer went into his horse pen to break the ice on water that had frozen. The farmer's nephews went to look for him when he did not come in for lunch. He was found dead on the ground in the horse pen with blunt trauma noted on his head from being kicked by a horse.

Prevention

Many farming-related deaths and injuries are preventable. Farming machinery, specifically tractor-related incidents, accounted for the highest numbers of deaths among farmers in Oklahoma. OKFACE data support the need for improved farm safety education programs targeting adult farmers and youth interested in farming or living on farms. Creative venues to reach farmers should be explored.

OKFACE program personnel have conducted in-depth, on-site fatality investigations for targeted causes of work-related injury deaths, including farming machinery-related incidents. Detailed reports of the investigated cases, including prevention recommendations, have been distributed statewide to agriculture instructors at the high school level, persons responsible for agricultural business management education for the adult farmers, and employers and agencies with interests in public workplaces. The reports are also electronically displayed on www.health.state.ok.us/program/injury/okface/index.html.

The following are general farm safety recommendations:

- Install rollover protective structures (ROPS) and seat belts on all tractors for which there is a manufactured retrofit.
- Use a seat belt at all times while riding on a tractor.
- Maintain safe speeds.
- Avoid operating tractors near ditches, embankments/steep slopes, and holes.
- Use slow moving vehicle placards.
- Use proper implements for hauling hay.
- Ensure the weight and distribution of the tractor's load is appropriate.
- Keep a fire extinguisher on tractors.
- Maintain tractors and other farm equipment in good working order.
- Check for people and obstacles before moving equipment.
- Never start or operate a tractor unless seated in the driver's seat.
- Disengage the PTO and shut off the tractor before dismounting.

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