



Farm Safety: Danger of Hair Entanglement in Hay Baler Drive Shafts¹

National Institute for Occupational Safety and Health²

Five women in New York have been scalped and/or suffered severe facial disfigurement due to their hair becoming entangled in hay balers. An article in this week's edition of the CDC Morbidity and Mortality Weekly Report (MMWR) recounts the details of four of these incidents and explores probable causes. All four incidents involved a secondary driveline which powers bale throwers on hay balers manufactured by New Holland in the early 1970's. The bale throwers that pose this hazard are Models 54A, 54B, 58, and 62, which were placed on a variety of New Holland hay balers. Although these models are no longer manufactured, an unknown number remain in use. It is essential that all farmers, farm family members, and farm workers be alerted to the hazards of working with this and other farm machinery.

The NIOSH Agriculture Health Initiative is supporting surveillance, research and intervention efforts directed at farmers, farm families, and farm workers nationwide. This particular hazard was identified through the Occupational Health Nurses in Agricultural Communities (OHNAC) program in New York.

NIOSH requests your assistance in alerting farm workers nationwide of the circumstances which resulted in these serious, debilitating and disfiguring injuries.

NIOSH researchers are concerned with the possible hazards associated with farm machinery of any type and manufacture. If you have any information on injuries associated with these balers or entanglement injuries associated with U-shaped guards on other farm equipment, please send to:

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A RECOGNIZED HAZARD

The secondary drivelines in these incidents were shielded; however, because of the inverted U-shape design, sometimes referred to as a tunnel guard, the shield did not completely enclose the secondary driveline. Furthermore, the driveline is located only 4 feet above the ground. It is difficult to see that the bottom of the shaft is not enclosed, which may give the operator an unintended false sense of security and contribute to these injuries. Since the mid-1970's, the manufacturer has acknowledged the potential hazard of the tunnel guard and has had a retrofit guard available that would reduce the hazard. Bale throwers currently manufactured by Ford-New Holland (formerly New Holland) are equipped with a shield which fully encloses the driveline.

In all four cases, the victims did not shut down the machine before dismounting their tractors. Shutting down the machinery is a vital safety practice recommended in the operator's manual for these balers and recommended whenever adjusting any machinery. As these four cases illustrate, the presence of shields alone does not remove all possible hazards. The following injuries resulted from hair becoming entangled in the rotating secondary driveline that powered the bale thrower.

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PREVENTABLE INJURIES

- In July 1991, a 47-year-old female had her entire scalp from the back of the neck to the facial browline removed. The injuries required extensive skin grafting and left her permanently disfigured.
- In July 1990, a 30-year-old female had all of her hair removed.
- In July 1981, a 42-year-old female had her right ear and the right side of her scalp removed.
- In July 1976, a 42-year-old suffered complete removal of her scalp and serious facial injuries, which necessitated extensive reconstructive surgery.

FREQUENCY OF ENTANGLEMENTS

The scalping injuries described above represent only one form of entanglement. Entanglement may also result in amputations, other severe injuries, and death. During the 9 year period from 1980-1988, an average of 16 workers, 16-years of age or older were killed by entanglements in power take-off (PTO) or similar rotating drivelines on agricultural machinery each year, according to NIOSH. In addition, between 1982 and 1986, there were an estimated 148 work-related hospital emergency room admissions annually for nonfatal injuries involving PTOs nationwide.

Entanglements involve recognized hazards and can be prevented. The four serious injuries described in the MMWR involved an inadequate U-shaped guard, for which a retrofit has been available for nearly 16 years.

THE NEED FOR SAFETY PRECAUTIONS WHEN USING FARM MACHINERY

The risk of injury and/or death while using farm machinery is substantial. Machinery accounted for 35 percent of all work-related deaths in agriculture between 1980 and 1988. In a study of eight states for the year 1989, machinery accounted for 29 percent of all nonfatal farming injuries. Although recent engineering designs have resulted in better shielding of drive shafts and other moving parts, farm machinery may remain in service for 40 years or more, and many farmers may be using machinery with inadequate shielding.

Equipment operators must take the following precautions to protect themselves:

- Turn off equipment by disengaging the PTO before dismounting and before you or others approach the machinery.
- Always follow the manufacturers' safety recommendations for machinery operation.
- Do not modify or remove any safety guards or safety equipment.
- Examine your equipment to ensure that all moving components are properly guarded. If better shielding is needed, contact an authorized equipment dealer to determine if safety modifications have been engineered or made available.

MORE INFORMATION

For more information on this or other occupational safety and health concerns, call toll-free: 1-800-35-NIOSH