

Foot Amputated by Fan in Fig Orchard¹

California NURSE Project²

SUMMARY : CASE 192-207-01

A farm worker was driving a mechanical harvester in a fig orchard. This harvester swept up the figs from the orchard ground. Then, a conveyor belt carried the figs past a big fan on the side of the machine which blew the dirt off them. A metal cover guarded the fan blades, but not the fan's exhaust outlet. Before his lunch break, the worker left the fan running and stood in front of the exhaust outlet, blowing the dirt and dust off his clothing. His foot entered the exhaust outlet to where it could touch the fan blades, about nine inches inside. The fan blades amputated his foot below the ankle.

A co-worker turned off the harvester, and the worker's foreman called 911 from a truck. Paramedics took the worker and his severed foot to the hospital. The foot was too mangled for doctors to sew back on. Later, doctors amputated his left leg below the knee so he could use an artificial leg.

How could this injury have been prevented?

- Employers should put guards wherever a person can touch moving equipment.
- Workers should use machinery only for the purposes for which it was designed, and for which safety training has been given.

BACKGROUND

On July 16, 1992, NURSE staff identified an injury which occurred in a fig orchard while reviewing records at a Level 1 Regional Trauma Center. On July 6, 1992, a farm worker was operating a mechanical harvester.

Before taking his lunch break, the worker stood in front of the harvester's exhaust blower fan to blow dust off his clothing. He removed his left shoe to blow dust off his socks. His left foot touched the unguarded part of the fan in the exhaust outlet and was amputated below the ankle.

A nurse from the NURSE Project interviewed the injured worker by telephone on August 5, 1992. The NURSE Project's Senior Safety Engineer evaluated a similar harvesting machine on August 12, 1992, and was able to inspect the mechanical harvester actually involved in the incident on October 2, 1992. At this time, he also discussed the incident with the farm owner/operator.

The farm owner/operator did not notify the California Occupational Safety and Health Administration (Cal/OSHA) of the incident. Cal/OSHA was later informed of the incident, however, they did not investigate the injury.

The incident took place in a fig orchard owned by a family corporation. The farm grows only figs, on approximately 120 acres, and owns two identical mechanical harvesters. The farm employs 5 full-time workers and 40 casual workers (working 1-12 weeks per year).

The Senior Safety Engineer reviewed the farm's written safety program and found that, although it addressed all seven points required by Title 8 California Code of Regulations 3203 -- Injury and Illness Prevention Program, the program was not being carried out at the time of the incident. (As of July 1, 1991 the State of California requires all employers to have a written seven point injury prevention program: 1.

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2. NURSE Project, California Occupational Health Program, 2151 Berkely Way, Annex 11, Berkely, CA 94704.

designated safety person responsible for implementing the program; 2. mode for ensuring employee compliance; 3. hazard communication; 4. hazard evaluation through periodic inspections; 5. injury investigation procedures; 6. intervention process for correcting hazards; and 7. a health and safety program.)

The Senior Safety Engineer noted that the farm did not conduct periodic inspections for hazards on the job, and did not conduct safety inspections of equipment. New and returning employees were not given safety training, and there were no regular safety meetings documented in the farm's safety records.

The injured worker had many years of experience harvesting figs and had operated this mechanical harvester for approximately ten years. The farm had purchased the mechanical harvester new about twenty years ago. The worker stated that he had received training in the operation of the mechanical harvester from the foreman, but had not received safety training. The worker's training was not documented in the owner/operator's records.

INCIDENT

On July 6, 1992, at approximately 12:08 p.m., the Emergency Medical Services (EMS) responded to a 911 call for assistance. Upon arrival two minutes later EMS found a 29 year-old Hispanic male lying on the ground beneath a tree, 15 feet from a mechanical harvester. His foot had been amputated by the fan on this mechanical harvester.

The injured worker had been re-hired for the season ten days before this incident. He operated a mechanical harvester in a fig orchard. The machine sweeps the figs from the orchard ground into an auger conveyor system that drops them onto a wire mesh conveyor belt. The conveyor belt carries the figs past a high volume blower fan, which blows the dust, leaves, and branches off the figs and out an exhaust outlet. After the figs are blown clean, the conveyor system drops them into large boxes, which are pulled on a trailer behind the harvesting machine. One operator steers the machine from the front, while a second employee rides the trailer at the rear, sorting and distributing the figs as they are deposited in the field boxes. The injured worker was steering the machine on the day of his injury.

At 11:48 a.m., just before his lunch break, the worker climbed down from the mechanical harvester. He stood in front of the exhaust outlet of the machine's blower fan to blow the dust off his clothing. The blower

fan is mounted on the side of the harvesting machine. It is approximately four feet in diameter, with dull metal blades. The fan takes in air from the top of the machine, and blows dirt and debris out the exhaust at the bottom. The blower fan is mounted inside a fan housing (metal cover), which shields the fan blades except at the exhaust outlet at the bottom of the fan. The fan blades are located approximately nine inches inside the exhaust outlet.

The injured farm worker did not remember the incident clearly. He had taken off his left shoe to blow dust off his socks. His foot entered the exhaust opening far enough to touch the fan blades, and the blades amputated his foot at the ankle.

The farm worker called for help. When his co-worker arrived, the injured worker told him how to turn off the fig harvesting machine. The co-worker then ran to notify the foreman, who called 911 from his truck. The EMS arrived at 12:10 p.m., about twenty minutes after the incident and two minutes after being notified. EMS elevated the injured foot, controlled the bleeding, administered oxygen and established an IV of lactated ringers solution. After retrieving the worker's amputated foot, they left the orchard fourteen minutes after arrival on the scene. EMS transported the injured worker to the Level I Regional Trauma Center, arriving about twenty-seven minutes after leaving the orchard.

At the trauma center, the injured part of the worker's lower leg was cleaned and a tourniquet was applied. The worker was taken up to the operating room to control bleeding. The severed foot could not be surgically reattached because of extensive tissue damage. Four days later he was transferred to local acute care hospital for insurance purposes.

On September 30, 1992, in a follow-up call, a nurse from the NURSE Project learned that the injured worker had undergone an operation to amputate his left leg below the knee, in order to provide an attachment point for a prosthetic device. The worker had received his prosthesis and was undergoing physical therapy.

PREVENTION STRATEGIES

1. Employers should instruct employees in how to use equipment safely, and to use it only for the purposes for which it was designed. This employee was not formally instructed in the safe operation of the mechanical harvester. He also used the machine's fan to dust off his clothing, a purpose for which it was not designed. Had the employee been

instructed to use the machine only for operations in which he had been trained, this incident might not have occurred.

2. Equipment should be designed with safety engineering in mind. In this incident, the mechanical harvester was over twenty years old, and had not been manufactured with a guard over the exhaust fan outlet. Employers should reassess old equipment before the harvest season begins, and retrofit it with safety features. The inspection should include the proper placement of guards on rotating shafts, gear drives, chain and sprocket drives, shear points and other possible contact points with moving equipment. In this incident, if the exhaust fan outlet had been fitted with a guard, the worker may not have been injured*. ***Title 8 California Code of Regulations 4002 (a): All machines, parts of machines, or component parts of machine which create hazardous revolving, reciprocating, running, shearing, punching, pressing, squeezing, drawing, cutting, rolling, mixing or similar action...shall be guarded.**

FURTHER INFORMATION

For further information concerning this incident or other agriculture-related injuries, please contact:

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The NURSE (Nurses Using Rural Sentinel Events) project is conducted by the California Occupational Health Program of the California Department of Health Services, in conjunction with the National Institute for Occupational Safety and Health. The program's goal is to prevent occupational injuries associated with agriculture. Injuries are reported by hospitals, emergency medical services, clinics, medical examiners, and coroners. Selected cases are followed up by conducting interviews of injured workers, co-workers, employers, and others involved in the incident. An on-site safety investigation is also conducted. These investigations provide detailed information on the worker, the work environment, and the potential risk factors resulting in the injury. Each investigation concludes with specific recommendations designed to prevent injuries, for the use of employers, workers, and others concerned about health and safety in agriculture.