

Dairy Worker Crushed by Field Cultivator¹

California NURSE Project²

SUMMARY : CASE 192-164-01

A worker on a dairy farm was waiting behind a field cultivator to attach it to the back of a tractor. A cultivator is a piece of farm machinery that has a row of metal teeth, set in a rectangular frame, with a wheel at each end. When pulled by a tractor the teeth break up the soil. This cultivator was set on its wheels and two support poles, which kept it from tipping backwards.

The worker stood close behind the cultivator. In front, a tractor driver was lining up his tractor to this cultivator. The driver's foot slipped on the clutch, and his tractor jumped backward and hit the cultivator. One of the support poles broke, and the cultivator fell over backwards and onto the worker. The cultivator frame landed on the worker's hips and stomach, separating his pelvic bones. He lay pinned by the cultivator and in great pain until enough workers arrived to lift the cultivator off him. He was taken to the hospital by helicopter, and could not return to work for over two months.

How could this injury have been prevented?

- Workers should not stand in the path of moving equipment. They should wait to one side until the equipment stops moving.
- Before hooking equipment to the tractor, turn off the tractor engine and set the parking brake.
- Make equipment safe. Outrigger wheels will keep cultivators from tilting over.

BACKGROUND

On June 26, 1992, NURSE staff identified an injury on a dairy farm while reviewing records at a Level 1 Regional Trauma Center. On June 17, 1992, a dairy worker was attaching a field cultivator to the back of a tractor when the tractor jumped backwards and knocked the cultivator off its support poles. The cultivator fell on the worker and its horizontal frame pinned the worker's hips to the ground.

A nurse from the NURSE project interviewed the injured dairy worker on July 17, 1992. The Senior Safety Engineer discussed the incident with the dairy's personnel manager, who is responsible for the dairy safety program, and investigated the scene of the injury on August 5, 1992.

The incident occurred on a farm with approximately 300 dairy cattle and 700 acres of corn. The farm has 23 full-time employees. The local chapter of a state dairy association uses a computer software package to produce written injury prevention programs for its members, and the dairy farm used one of these programs. The Senior Safety Engineer reviewed the program and noted it addressed all seven points included in Title 8 California Code of Regulations 3203 -- Injury and Illness Prevention Program. (As of July 1, 1991 the State of California requires all employers to have a written seven point injury prevention program: 1. 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.)

1. This document, CDHS(COHP)-FI-92-005-19, was extracted from a series of the Nurses Using Rural Sentinel Events (NURSE) project, 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. Publication date: October 1992

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

The injury was not reported to the California Occupational Health and Safety Administration (Cal/OSHA), and was not investigated by Cal/OSHA.

The injured dairy worker had worked on this farm for 26 years. The personnel manager told NURSE staff that short safety meetings are held in the field every two weeks. However, the injured dairy worker said that because of his long experience he did not need, and had not received, safety training.

INCIDENT

On June 17, 1992, at approximately 4:30 p.m., a 53 year-old Portuguese male dairy worker was hooking a field cultivator to a tractor. The tractor was going to pull the cultivator across a new field of corn to dig shallow irrigation ditches. The cultivator was built on the dairy farm. It consists of a rectangular frame of horizontal bars about 20 feet wide. Vertical bars attach to the bottom of the frame to form teeth that break up the soil. Two metal wheels, mounted five feet in from either side, create the irrigation furrows.

When the cultivator sits on the two metal wheels it is unstable, and can tip forwards or backwards. Factory-manufactured cultivators are built with a support system, sometimes with outrigger wheels at either end of the horizontal frame to keep the cultivator from tipping. This cultivator, built on the farm, had a metal pipe mounted on each side of the frame, projecting down and backwards. The cultivator was propped on these pipes, keeping the frame from hitting the ground.

The dairy worker stood behind the cultivator and waited to connect the cultivator to the pull bar of a tractor. A pull bar is a metal bar attached to two support arms mounted one on each side of the tractor axle. The height of the cultivator can be adjusted by raising and lowering these arms hydraulically. The worker stood behind the cultivator because he found it easier to reach over the cultivator and connect it to the tractor from the rear.

The tractor driver was lining up the tractor with the cultivator. With the tractor in reverse gear, the driver's foot slipped off the clutch pedal and the tractor jumped backwards, striking the cultivator. The impact broke the pin that connected one of the support pipes to the cultivator frame. With one support pipe gone the cultivator tilted backwards. As it tilted the rear edge of the frame knocked the worker down and pinned him to the ground at his lower abdomen.

The worker was pinned for 3-4 minutes, when the farm owner's son and his friends saw the pinned worker as they drove by the equipment yard. Five men, including the tractor driver, tilted the cultivator up and the injured dairy worker crawled out. The farm owner's son used his truck radio to contact the farm owner, who called 911.

The Emergency Medical Services (EMS) was called at 4:46 p.m. A paramedic team arrived at 4:52 p.m., and a California Highway Patrol helicopter arrived at 5:02 p.m. He was short of breath, and complained of severe pain to his lower back and abdomen. The paramedics gave him oxygen and started an IV. At 5:25 p.m., he was transported by helicopter to the emergency department of the Level 1 Trauma Center, arriving at 5:32 p.m.

The injured dairy worker had no fractures or internal organ damage, but the weight of the cultivator bar falling on his lower abdomen had separated his pelvic bones. A small amount of blood was found in his urine, although there was no apparent damage to his kidney or bladder. The injured dairy worker was admitted to the hospital for further observation and evaluation.

After three days in the hospital he was up and walking. The injured dairy worker was discharged and given an appointment for follow-up with an orthopedic physician in two weeks. He was advised to remain home, on medical disability, for at least one month and to avoid all lifting. At the time of the interview, he complained of pain and had not returned to work. At the end of August he was feeling better but had not returned to work.

PREVENTION STRATEGIES

1. Workers who are working as a team need to be sure there is constant communication and visual contact between themselves. In this incident, the dairy worker and the tractor driver were working together to connect the cultivator to the tractor. Tractors are loud equipment and may interfere with verbal communication between workers. The injured worker should have waited for a signal from the tractor driver before he approached the cultivator to put the connector pins in.
2. Standard operating procedures should ensure that workers never place themselves in hazardous situations to complete a work task. In this incident, the dairy worker stood too close to a heavy piece of unstable equipment, which itself was in the path of

a moving tractor. The farm's work procedure should require workers to wait to the side and out of the path of moving equipment until it comes to a complete stop and has been turned off. If the worker had stood to the side of the tractor and cultivator until the tractor was turned off, he would not have been knocked down and injured when the tractor struck the cultivator.

3. Tractor engines should be shut off before connecting equipment to the tractor. The tractor driver should have turned the tractor off much sooner and set the parking brake on the tractor before signaling the dairy worker to begin hooking up the cultivator. If the tractor had been shut off then, it would not have lurched backwards, causing the cultivator frame to fall on the worker.
4. Employers should consider safety engineering when building or modifying equipment. Because this cultivator did not have side, stabilizing outrigger wheels, it was not as stable as a commercially manufactured cultivator. In addition, the pins connecting the stabilizing bars to the frame sheared at the tractor impact. If the cultivator had been built with stabilizing wheels, or with two-inch pins connecting the support pipes to the frame, the tractor would not have been able to knock the cultivator over and onto the worker.

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.