

California Department of Public Health
Occupational Health Branch

**FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM
(CA/FACE)**

A farm laborer died after he was caught in the
rotating feed roller of a brush shredder
Case Report: 21CA002

SUMMARY

A farm laborer died when he was caught in the rotating feed roller of a brush shredder. He was operating the brush shredder to clear debris and branches in an almond field when the incident occurred. The victim positioned himself in front of the feed roller while the shredder was still powered on, possibly to dislodge branches stuck in the feed roller teeth, and became caught in the rotating teeth. The CA/FACE investigator determined that, in order to prevent similar incidents, employers who operate brush shredders should:

- Retrofit or purchase brush shredders with an operator presence sensing system (OPSS).
- Provide comprehensive worker training including safe work practices, hazard recognition, and how to respond to or avoid unsafe conditions.
- Post clearly visible and language-appropriate safety warning labels both inside the cab and on the outside of the shredder above the feed roller.

INTRODUCTION

On Saturday, February 6, 2021, a 22-year-old Hispanic farm laborer suffered fatal injuries on an almond farm in the California Central Valley region when he was caught in the rotating feed roller of a brush shredder. CA/FACE investigators received notification of this incident from the California Division of Occupational Safety and Health (Cal/OSHA). Contact was made with the employer of the victim on June 10, 2021. On July 1, 2021, CA/FACE investigators traveled to the incident scene and interviewed the victim's employer, the employer's attorney, the employer's safety consultant, two of the employer's supervisors, and the agricultural services company that contracted with the employer. Photos of the brush shredder involved were taken. Attempts to interview two shredder operators who were employed at the time of the incident, and the manufacturer of the shredder, were unsuccessful. A former employee who had worked for the employer as a brush shredder operator was interviewed by telephone on November 4, 2021. Employer documents, the death certificate, and the county coroner's report were obtained and reviewed.

EMPLOYER AND AGRICULTURAL SERVICES COMPANY

The employer of the victim was a farm labor contractor who supplied workers to agribusinesses

in the California Central Valley. Laborers were hired to prune crops, operate farm equipment, clear fields postharvest, and perform other farm-related job tasks. At the beginning of 2021, an orchard owner contracted with an agricultural services company (contractor) to clear debris from an almond orchard postharvest. The contractor then subcontracted with the employer to provide a worker to complete this job with a brush shredder. The victim was working for the employer who gave him this work assignment. At the time of the incident, the employer had 30 full-time employees, including two additional machine operators. The number of workers employed by the contractor varied due to the seasonal nature of agricultural work.

WRITTEN SAFETY PROGRAMS AND TRAINING

The employer provided the following documentation to CA/FACE Investigators: business license, company registration, certificate of workers' compensation insurance, Injury and Illness Prevention Program, Heat Illness Prevention Program, COVID-19 Prevention Program, Google maps of the incident scene, Cal/OSHA 300 logs, the brush shredder operator manual and maintenance records, and worker training records.

Safety training was conducted by the employer's safety consultant. Specific training topics included COVID-19, heat illness, and other topics. The safety consultant specialized in providing safety training to farm labor contractors and their employees in the California Central Valley. For this job, the contractor conducted the training on the brush shredder instead of the safety consultant. According to the employer's training records, the victim completed a series of safety trainings on various farm work tasks. There was no written documentation that the victim had received formal training on safe operation of the shredder or how to unjam the feeder. It is also unknown if the victim was tested (or observed) on how to correctly unjam the feeder.

According to the contractor, the victim received on-the-job training (OJT) on the operation of the shredder. However, no documentation of this training was provided. The contractor also stated that he did ride-alongs with the victim during the five days prior to the incident.

WORKER INFORMATION

The victim was a 22-year-old male Hispanic farm laborer who had been working for the employer for 1½ months. The victim worked Monday through Saturday on a 7 a.m. to 5 p.m. shift. The victim had previously worked as a laborer and machine operator for other farm labor contractors.

BRUSH SHREDDER

The brush shredder in this incident was hydraulically-powered and had a rotating feed roller equipped with a row of approximately five-inch teeth (Exhibit 1). The forward rotating motion of the teeth grinds and shreds branches. The operator controls the direction of the feed roller with a forward switch and reverse switch. The reverse switch is used to eject jammed branches stuck in the teeth. The feed roller is in a raised position when not in operation and is lowered to

the ground when in operation. The contractor owned three brush shredders and provided maintenance records from the last two years for all three machines. Maintenance procedures included inspections of the cutting head assembly, engine compartment, frame structure, and cab; oil changes; and other preventative maintenance tasks. The brush shredder in this incident had been owned by the contractor for two years. The manufacture date for the brush shredder could not be confirmed.



Exhibit 1. Roller and shredder teeth.

INCIDENT SCENE

The incident scene is an almond farm in the Central Valley of California. The incident took place in the center of one of the multiple rows of almond trees (Exhibit 2).



Exhibit 2. The brush shredder in the almond field.

WEATHER

The weather on the day of the incident was 53 degrees Fahrenheit, with 65% humidity and wind speeds ranging from zero to five miles per hour [Weather Underground 2021].

INVESTIGATION

At the time of the incident, the laborer was working alone, operating a brush shredder to chop and mulch orchard prunings during the postharvest season in an almond orchard. Postharvest mulching has become a common practice in California's almond industry, especially in recent drought years because it increases soil organic matter, enhances microbial activity, and improves water holding capacity.

The employer stated that, as part of his training, the victim had been instructed to contact the contractor daily for post-shift safety check-ins as well as to report daily shredding progress. On the evening of February 6, 2021, the contractor did not receive a call from the victim. Neither the contractor nor the employer was able to reach the victim on his cell phone the entire evening.

The next morning on Sunday, February 7, 2021, at approximately 9:45 am, the contractor went to the incident site and found the victim in the middle of a row of almond trees caught in the blades of the brush shredder (Exhibit 3). First responders were notified and found the victim deceased upon arrival.



Exhibit 3: The sheriff arriving at the incident scene.

CAUSE OF DEATH

The cause of death, according to the death certificate, was traumatic amputation of the legs.

RECOMMENDATIONS

The CA/FACE investigator determined that, in order to prevent future incidents, employers who operate brush shredders should:

Recommendation #1: Retrofit or purchase brush shredders with an operator presence sensing system (OPSS).

Discussion: Machines with OPSS have sensors that detect operator presence. An OPSS provides a fail-safe condition when an equipment operator is no longer in the driver's seat. These safety devices set off an alarm, turn off one or more power sources, and/or apply the brakes to the machine when the operator leaves the seat with the engine on or in gear. If this shredder was designed or retrofit with an OPSS, the blades would not have been able to turn and pull the victim into the shredder mechanism.

It is possible that the victim exited the cab to attempt to dislodge branches that could not be ejected using the reverse/forward blade mechanism. It could not be confirmed if, under usual operations, brush can remain jammed in the feeder despite reversing the blades. On this machine, there was continued power to the blades if the operator exited the cab while the machine is running. In this incident, brush may have become jammed in the blades and the victim may have been trying to kick these branches loose. He may have lost his balance and was pulled into the roller.

Recommendation #2: Provide comprehensive worker training including safe work practices, hazard recognition, and how to respond to or avoid unsafe conditions such as a jammed feeder.

Discussion: Although the employer had an IIPP and the victim had received safety training (mostly OJT) on various farm work tasks, there was no documentation that the victim received formal training in the safe operation of the shredder, or knew how to unjam the feeder. Brush shredder operators should be trained on how to respond to different problems commonly encountered in the field. The training should include testing and evaluation to verify and document an employee's achievement of skills. Different scenarios should be presented, and solutions discussed. For example, a scenario may involve the actions a worker should take if the usual blade reversal/forward procedures fail to dislodge stubborn brush. Solutions may include manually removing mulch from the blades (this requires lockout/tagout procedures); transporting the machine to a repair shop; or calling the contractor for further direction. An additional scenario may involve a worker losing their balance while kicking branches into the center of the roller's path. In this situation, a worker should be trained to use a tool to dislodge material. If the victim was given more comprehensive training focused on alternative solutions to different problems encountered in the field, he may not have positioned himself in front of the shredder and been pulled into the blades.

Recommendation #3: Post clearly visible and language-appropriate safety warning labels both inside the cab and on the outside of the shredder above the feed roller.

Discussion: While safety warning labels by themselves may not prevent injuries and fatalities, they can be an effective tool to complement an existing safety program. Before purchasing warning labels, it is important to consider certain characteristics:

- **Visibility:** The color/size/font of letters and the contrasting background color will dictate the degree of visibility. The information on the label should be visible to a reader coming from a far distance.
- **Attachment Method:** The type of method would depend on the adhering surface material. Some surfaces would only require glue while other surfaces will require welding in order to attach a sign.
- **Material:** Labels used on agricultural machinery have to be able to withstand highly variable environmental conditions (e.g., temperature, UV light, and wind).
- **Content:** An effective label should provide some indication of a problem, followed by a desirable safe action. For example, a sign can state a type of hazard (Example: Danger! Rotating Sharp Teeth), its consequences (Can Cause Amputation or Death), and action needed to avoid this hazard (Do not stand in front of machine while engine is on). Only one message should be contained on a single label so that the label will not be crowded with too much information.
- **Symbols Versus Words:** Employers should evaluate whether it is more effective to use symbols rather than words on a label. Signal words commonly used in agriculture may also be good choices to use on a warning label.
- **Location of Labels:** Labels should be visible from a distance not obstructed by other parts of the machine. Wider machines may benefit from having two labels, one on each side. Labels should be on both the inside of the cab and the outside of the shredder. Exhibit 4 shows that there were no safety warning labels inside the brush shredder involved in the incident.
- **Periodic Inspection of Labels:** All labels fade with time. It is important to periodically inspect the labels and replace those that are fading. Exhibit 5 shows the fading label on the outside of the brush shredder involved in this incident.
- **Other Warning Formats:** Although a safety checklist is not a label, it serves as a good reminder of safe operating procedures and can be posted next to the control panel. The checklist can include emergency contact information which is especially important since agricultural workers often work alone on the weekends. An available copy of the brush shredder instruction manual may be useful in certain emergency situations and can be stored next to the control panel. Important portions of a manual can be translated to languages used by workers.
- **Training:** Employers should train workers on how to recognize and interpret posted safety labels. Languages used on the labels should be understandable to workers. Figure 5 shows that the label on the machine involved in the incident was only in English.

If there were clear and highly visible warning labels on the brush shredder involved in this incident, the victim might have heeded the warnings to not stand in front of the rotating feed roller.



Exhibit 4. No warning labels were posted on the inside of the cab.



Exhibit 5. Faded warning sticker on the front of the shredder.

REFERENCES

ANSI/ASABE AD11684:1995 APR2011 (R2021) - Tractors, machinery for agriculture and forestry, powered lawn and garden equipment – Safety signs and hazard pictorials – General principles.

California Division of Occupational Safety and Health - Title 8 regulations - Subchapter 7. General Industry Safety, Group 3. General Plant Equipment and Special Operations. Article 13. Agricultural Operations Title 8, Section 3441. Operation of Agricultural Equipment.

California Division of Occupational Safety and Health - Title 8 regulations - Subchapter 7. General Industry Safety, Group 2. Safe Practices and Personal Protection. Article 7. Miscellaneous Safe Practices. Title 8, Section 3314. The Control of Hazardous Energy for the Cleaning, Repairing, Servicing, Setting-Up, and Adjusting Operations of Prime Movers, Machinery and Equipment, Including Lockout/Tagout.

Cal OSHA Safety and Health in Agricultural Operations
https://www.dir.ca.gov/dosh/dosh_publications/Ag-Field-Operations.pdf

NIOSH Agricultural Safety www.cdc.gov/niosh/topics/aginjury

NIOSH Protecting Safety and Health in Agriculture
www.cdc.gov/niosh/newsroom/feature/NatFarmSHwkSep2020

UC Davis Western Center for Agricultural Health and Safety <https://aghealth.ucdavis.edu/>

State Compensation Insurance Fund Safe at Work Series – Agriculture
<https://www.safeatworkca.com/industry/agriculture/>

Top 10 CAL/OSHA Citations in Agriculture Webinar (2020)
<https://www.safeatworkca.com/safety-seminars/on-demand-videos/top-10-citations-agriculture/>

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Public Health, in cooperation with the Public Health Institute and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations of work-related fatalities. The goal of the CA/FACE program is to prevent fatal work injuries. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in fatal injury, and the role of management in controlling how these factors interact. NIOSH-funded, state-based FACE programs include: California, Kentucky, Louisiana, Massachusetts, Michigan, New York, Oregon, and Washington.

Additional information regarding the CA/FACE program is available from:

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