

REPORT#: 17MI142

REPORT DATE: 12/20/19

INCIDENT HIGHLIGHTS



DATE:

Summer, 2017



TIME:

Between 8:30-9:30 a.m.



VICTIM:

Farm laborer in his 40s



INDUSTRY/NAICS CODE:

Agriculture/11



EMPLOYER:

Fruit Farmer



SAFETY & TRAINING:

Tractor training



SCENE:

two-track behind packing barn



LOCATION:

Michigan



EVENT TYPE:

Machine/Runover



Farm Laborer Run Over by Tractor With Broken Parking Brake

SUMMARY

In summer 2017, a male farm laborer in his 40s died when he was run over by a Deutz 3006 farm tractor. The decedent was driving a Deutz 3006 low profile orchard tractor pulling a 16-foot long, 6-foot wide single axle trailer with fruit lugs and orchard ladders on a two-track drive behind the packing barn. When he did not arrive at the orchard, his coworkers returned to the packing barn to look for him..... [READ THE FULL REPORT](#)> (p.3)

CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Tractor was difficult to start that morning and decedent left tractor running and in neutral on a downhill slope when he dismounted.
- Tractor's emergency brake was non-functional.
- Unsecured orchard ladders and fruit lugs at front of trailer. [LEARN MORE](#)> (p.8)

RECOMMENDATIONS

NIOSH investigators concluded that, to help prevent similar occurrences, employers should:

- Ensure tractor operators utilize proper tractor shut-off procedures prior to exiting the tractor seat.
- Inspect and maintain equipment to ensure it is in good operating condition.
- Ensure tractor operators are trained and demonstrate competency before allowing individual to operate the tractor.
- Establish and enforce rules for equipment transport on towed trailers. [LEARN MORE](#)> (p.8)



MICHIGAN

State **FACE** Program

Fatality Assessment & Control Evaluation

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SUMMARY

In summer 2017, a male farm laborer in his 40s died when he was run over by a Deutz 3006 farm tractor. The decedent was operating the Deutz 3006 low profile orchard tractor pulling a 16-foot long, 6-foot wide single axle trailer with a steel frame and wood surface loaded with fruit lugs and ladders on a two-track path behind the packing barn. The two-track ran downhill south to north with a slight grade. On the west side of the path were tall weeds, brush and trees. The east side of the two-track was grass and then a wooded area. The farm owner had met with the decedent and two other farm hands at approximately 8:00 a.m. and gave them their work assignments; the decedent and a coworker to pick plums and the farm manager to tend to the irrigation system. The farm manager and the coworker left in the farm manager's car and drove to the plum orchard. The decedent was to bring the tractor and trailer with the lugs and ladders to them. His two coworkers waited about 15 minutes, and when he did not arrive, they drove back to the packing barn to look for him. One of the coworkers saw the tractor, which was still running and in neutral positioned at an angle in the tall grass against a tree on the west side of the two-track path; the trailer was positioned on the two-track path. The coworker looked and called for the decedent. Not seeing him or hearing a response, the coworker got on the tractor and moved it backward onto the two-track. The coworker felt the rear tire of the tractor rise and then the decedent's body came into view. Emergency response and the owner were summoned. The decedent was pronounced dead at the scene. When the owner arrived at the scene, he found a ladder on the trailer tongue.

INTRODUCTION

In summer 2017, a male farm laborer in his 40s died when he was run over by a Deutz 3006 farm tractor. MIFACE learned of this incident upon receiving notification from MIOSHA. MIFACE personnel contacted the farm owner who agreed to be interviewed. The MIFACE researcher traveled to the farm. MIFACE reviewed the death certificate, police and medical examiner reports, and the MIOSHA file during the writing of this report. Pictures used in the report are courtesy of the responding police department, Google maps, and the MIFACE researcher.

EMPLOYERS

The decedent's employer was a fruit farmer, who grew assorted apples, apricots, sweet cherries, peaches, nectarines, Japanese plums and plouts on 65+ acres. The total farm land owned by the farm owner was 85 acres. The farm was family owned; he had been the sole operator since 1984. The farm owner indicated to responding police that he was uncertain of the decedent's last name. Due to the decedent not having a valid Michigan operator's or driver's license, the farm owner indicated that the decedent's paychecks were made out to his girlfriend.

In addition to selling his fruit to commercial buyers, the owner also participated in farmer's markets.

WRITTEN SAFETY PROGRAMS and TRAINING

The farm did not have a written safety program or written safety rules or procedures. The farm owner identified himself as "in charge of safety" on the farm. The farm owner indicated that he, or the farm manager, when holding production meetings, there was a safety topic discussed. The farm owner stated he provided, on an annual basis, the equivalent of two days of training which encompassed verbal and on-the-job training, harvesting safety (including fatigue in the field), ladder use and placement, safe tractor operation, and heat stress. The farm owner did not keep training records.

The farm owner indicated to the MIFACE researcher that tractor training included: do not push clutch in uphill or downhill unless the brake is engaged; before dismounting the tractor on flat ground, place it in gear and turn the tractor engine off.

The farm owner stated that routinely, after packing the day's picked crop, he would sit everyone down and talk about the next day's assignment, which fields were to be picked the following day, and emphasize how to safely set up the ladder in the field. If this instruction was not given at night (due to the finishing time), the owner would have this meeting first thing in the morning.

WORKER INFORMATION

The decedent had worked on the farm for two seasons; his first season was apples the previous fall. He worked full time at the farm. According to the farm owner, he had been trained to operate the tractor.

Both of the coworkers and the farm owner described the decedent as "clumsy" and that "he fell a lot". The farm owner indicated that the decedent "was a slow picker but always on time and willing to do anything asked of him". Some of the decedent's duties on the farm included driving the tractor, working in the packing barn, irrigation and picking. The farm owner also mentioned that the decedent would walk with the farm owner due to a recent medical issue the farm owner was experiencing. The decedent had a previous left shoulder injury; it is unknown if this was a factor in the incident.

The farm manager (FM) was a full time employee. He had worked on farms for many years, and had been with the farm owner for the past three years. The farm owner delegated some of the tasks, such as designating orchards to be harvested, to the farm manager.

Information was not gathered regarding the work experience of the part-time employee (PT).

Hours worked by the three employees depended upon the amount of fruit picked and how long it took to pack the day's harvest. Routine work hours were 7:00 a.m. to approximately 1:00 p.m., took a break for lunch, and then worked in the packing barn until all fruit was packed, but may change due to harvest conditions.

The farm owner indicated to the MIFACE researcher that there had been "three good days of picking" so the workers worked long days; the day's harvest would begin at 6:30 a.m. The workers harvested fruit until 5:00 p.m., had a quick dinner, then worked in the packing barn until 10:00 pm. The farm owner could not remember when asked by the MIFACE researcher if there had been any days off between the three good days of picking and the incident date.

INCIDENT SCENE



Figure 1. Google Map overview of farm. Identifying road names removed by MIFACE.

The farm was located on the west side of the roadway. There was one residence located on the parcel, a packing barn, and a few other small miscellaneous out buildings, one of which stored the tractor.

There were four gravel entrances to the property. The northern-most entrance initially ran parallel to the roadway directly in front of the packing barn, then turned south/southwest for a short distance before turning south and running behind a small shed and behind the actual residence. This gravel driving area continued south and met the fourth and southern most entrance to the property. The second entrance went north to the front of the packing barn. The third entrance immediately accessed the residence and was located on the south side of the residence.

The incident occurred on a two-track path on the property behind the 30- x 88-foot packing barn. The packing barn had a sorting conveyor a large cold refrigerator, and dry storage. The two-track path headed north off the gravel drive just as it turned south to go behind the shed and residence. A pull behind camper was parked behind (the west side) of the packing barn; this was where the decedent and his girlfriend were currently residing. The two-track ran downhill south to north with a slight grade. There were some weeds and small brush leading into woods along the west side of the two-track path. On the east side of the two-track path was grass and another wooded area, the camper and packing barn.

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The 4,120-pound tractor involved in the incident was a Deutz tractor, Model D 30 06 (See Photo 1). The year of manufacture was unknown. The owner bought the tractor at a farm auction – year unknown. The farm owner indicated to the MIFACE researcher that the tractor had an emergency brake, but it was non-functional (See Photo 2).

The operator accessed the operator seat from the left (driver’s) side of the tractor using a foot plate.

Attached to the rear of the tractor was a farm-built 16-foot 6-inch long and 6-foot 3-inch wide single axle flatbed trailer. The trailer frame was steel with a wood plank surface. The trailer was routinely stored at one of the orchards.



Photo 1. Picture of Deutz tractor operated by decedent. Tractor in storage barn.

WEATHER

Weather Underground was utilized to check the weather conditions on the day of the incident. A weather station for the exact location was unavailable so MIFACE researchers utilized a nearby weather station’s data. The weather on the day of the incident was approximately 69 degrees Fahrenheit with partly cloudy skies. Wind was from the west-northwest/northwest at 6 mph-7 mph. Weather station data indicated that it had rained each of the two days prior to the incident but did not note precipitation amounts. [\[Weather Underground\]](#) It is unknown if weather was a factor in this incident.

INVESTIGATION

At 8:00 a.m. on the day of the incident, the farm manager (FM), the decedent, and the part-time employee (PT) met with the farm owner in the owner’s home to discuss the tasks to be accomplished. The FM was assigned to irrigation tasks and the decedent and PT were assigned to harvest Japanese plums from a 9-acre orchard.

The FM indicated to responding police that the tractor was hard to start that particular day. The tractor and trailer were in front of the packing barn. The FM noted to the responding police that the decedent had a hard time driving the tractor and stated “he has an even harder time backing a trailer”. The FM usually backed the trailer for the decedent. On this day, he did not back the tractor and trailer and according to the FM, that was the reason the decedent was headed around behind the packing barn on the two-track road.



Photo 2. Arrow points to emergency brake identified by owner as non-functional

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The crew loaded the trailer with the fruit lugs and three 8-foot orchard ladders. They placed the ladders lengthwise at the front of the trailer and did not secure them. The farm owner stated to the MIFACE researcher that he had previously spoken with the employees on how to load the ladders on the trailer. The ladders should have been laid sideways at the rear of the trailer and secured with bungee cords. No bungee cords were found at the scene.

The decedent was assigned to bring the harvesting equipment to the orchard. The FM and PT left the packing barn staging area and traveled to the plum orchard in FM's car. They waited about 15 minutes at the orchard, and when the decedent did not arrive, they drove back to the packing barn and looked for him. While driving back, they did not see the tractor. They drove the gravel drive and saw the trailer on the two-track path. The tractor was positioned at an angle in the tall wet grass against a tree on the west side the two-track drive. The tractor engine was running and the tractor

was in neutral gear. Tractor tire tracks indicated the tractor had traveled approximately 12 feet west off the two-track and into the foliage. There were no skid marks in the dirt.

The FM walked around the tractor and trailer while calling for the decedent, whom he did not see because he was located under the trailer. FM indicated to investigators that he assumed that the decedent had gone back up to the farm house. FM got on the tractor and began backing



Photo 3. Google map. Probable path of decedent per farm owner based on tire marks at time of incident.

it out of the foliage and onto the two-track path when he felt the left side of the tractor go up and over something. Looking down to his left, he saw the body of the decedent. While backing the tractor, the left rear tractor wheel had driven over the decedent's upper legs. FM also saw the decedent's face and noted it was blue. He moved the tractor off the decedent; the decedent was now positioned underneath the mid-section of the tractor between the front and back wheels.

FM told PT to call for help. PT became very emotional, got on her cell phone and attempted to dial 911. PT then ran up to the farm house prior to connecting with 911 as she was having a hard time doing so via her phone. FM was not sure what to do and he also ran to the house. PT contacted emergency response at the owner's home, and during the call, the farm owner took over. The three individuals returned to the incident scene, albeit slowly as the farm owner was using a crutch. Everyone returned and 911 told the workers to pull the decedent out from under the tractor. The farm owner instructed FM to do CPR. FM did not know how to perform CPR and was reluctant to perform CPR based on the

injuries sustained by the decedent; however he did CPR as instructed by the farm owner who was on the phone with 911. PT was instructed to go to the roadway to direct emergency responders to the incident scene.

The fire department personnel arrived on scene. The fire department and police personnel took over the resuscitation efforts. An AED was applied and did not identify a shockable rhythm. At the time of emergency responder arrival, the decedent's head/face were cyanotic. Emergency responders briefed on scene and called medical control for determination of death and resuscitation efforts ceased.

The incident was unwitnessed. When the decedent's clothing was pulled up to expose his chest for application of AED pads, there was a tire tread pattern observed which appeared consistent with the front tires of the tractor. The tire pattern was angled from his upper left chest towards the mid/bottom of the rib cage on his right. An orchard ladder was found on the trailer and trailer tongue. Evidence at the scene led to the development of the following hypothesis: An orchard ladder was falling off the trailer bed on the passenger side as he traveled on the gravel road and then on to the two-track path. The tractor was positioned downhill on the two-track. The decedent dismounted on the driver's side, leaving the engine running and the tractor in neutral gear. He walked around the front of the tractor to place the ladder on the trailer. As he walked in front of the tractor, in neutral with the engine running, the tractor rolled forward on the downhill grade of the two-track path. The weight of the trailer may have contributed to tractor rolling forward and running the decedent over.

MIOSHA Citations

MIOSHA General Industry Safety and Health Division issued the following Other-than-Serious violation to the employer at the conclusion of its investigation.

OTHER-THAN-SERIOUS: RECORDING AND REPORTING OF OCCUPATIONAL INJURIES AND ILLNESSES, ADM PART 11, RULE 408.22139(1): Fatalities. Within 8 hours after the death of any employee from a work-related incident, you must report the fatality by telephone to the MIOSHA toll-free central telephone number: 1-800-858-0397.

A fatality was not reported to MIOSHA for approximately four (4) months after the employer was notified.

CAUSE OF DEATH

The death certificate listed the cause of death as blunt force injuries and traumatic asphyxia. Post-mortem toxicology was negative for alcohol, illegal drugs and prescription medication. Post-mortem toxicology was positive for nicotine and cotinine that were non-contributory.

CONTRIBUTING FACTORS

Occupational injuries and fatalities are often the result of one or more contributing factors or key events in a larger sequence of events that ultimately result in the injury or fatality. The following hazards were identified as key contributing factors in this incident:

- *Tractor's emergency brake was non-functional.*
- *The tractor had been difficult to start that morning and the decedent left the tractor running and in neutral while on a downhill slope when he dismounted.*
- *Inadequate tractor parking procedures.*
- *Unsecured orchard ladders and fruit lugs were placed at front of trailer.*

- *Decedent had difficulty backing up the tractor and trailer.*

RECOMMENDATIONS/DISCUSSION

Recommendation #1: Owners/operators should inspect and maintain equipment to ensure it is in good operating condition.

Discussion: Like many farmers, the farm owner used the tractor “because it still worked”. The tractor, although operable, had at least one major safety issue - a non-functional emergency brake. Additionally, the tractor was difficult to start that morning. The inability of the decedent to use the emergency brake to prevent the tractor from rolling was and his presumed reticence for shutting the tractor off prior to dismount were factors in this incident.

Important to safe equipment use is timely equipment maintenance; the tractor the decedent was using was not maintained according to the manufacturer’s requirements.

Maintenance can be divided into two types, preventive and corrective. Preventive maintenance can be described as a set of activities to improve the overall reliability and to prevent failure of the equipment. Corrective maintenance can be described as unscheduled or failure-based equipment maintenance. When servicing equipment, owners/operators or qualified service personnel should follow the recommendations provided in the manufacturer’s operator/service manual for the equipment.

Tractor owners should ensure that any individual, including themselves, conduct a pre-operational check of the tractor to ensure that all safety controls are in place and a systems check to ensure all systems are in good operational condition. If there is an identified issue with the tractor, it should be taken out of service until repaired.

A pre-operational safety checklist, as a minimum, could include these items:

- Check for loose, broken, missing, or damaged parts. Have everything put in good repair.
- Make certain all safety devices are in place.
- Check ROPS and safety belt for damage. (A damaged ROPS or safety belt **MUST** be replaced).
- Make certain implements and attachments are properly installed and that the tractor and implement PTO RPM ratings match.
- Check service and parking brakes for proper operation.
- Check that PTO drive locking devices are latched.
- Check that the tractor PTO shield and driveline guarding are in place and operating properly.
- Check the tractor and implement hydraulic system. Have any leaks or damaged parts repaired.

A pre-operational systems check, as a minimum, could include:

- Check the tires for cuts, bulges and correct pressure. Replace worn or damaged tires.
- Check the engine oil system. Add oil if required.
- Check the radiator for liquid level.

Recommendation #2: Tractor operators should always utilize proper tractor shut-off procedures prior to exiting the tractor seat.

Discussion: Tractor operators should follow safe shut down procedures prior to dismounting the tractor. It is unknown if the farm owner had the tractor's operating manual; if not, the farm owner should request one and use it to provide operator training. The tractor's operating manual should be followed for any specific instructions. For their own safety and that of bystanders, operators should never leave the driver's seat of a tractor that is still running and should properly shut off the tractor before leaving the operator's seat. The Deutz tractor did not have a "park" option for the transmission. The running tractor, while in neutral, facing downhill with the weight of the trailer behind it, had nothing to stop it from moving forward. Whenever a tractor operator leaves the tractor seat, it is imperative for his/her safety to turn the tractor off.

Before dismounting the tractor, operators should always:

- Disengage the PTO and lower all implements to the ground
- Place all controls in the neutral position
- Place the transmission in park lock, or if a manual transmission, place in the lowest gear
- Set the parking brake(s)
- Stop (turn off) the engine
- Remove the key

Recommendation #3: Farm owners should ensure tractor operators are trained in tractor operation and demonstrate competency in all aspects of tractor operation pertinent to their job.

Discussion: MIOSHA Agricultural Safety Standard Part 51, Agricultural tractors requires employees to be informed, at the time of initial assignment and at least annually thereafter of the following nine operating instructions located in Appendix A of Part 51. The owner indicated that he provided annual training, but the content of the training was undocumented.

APPENDIX A
EMPLOYEE OPERATING INSTRUCTION

1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

MIFACE recommends farm owners, in addition to providing required tractor training, “test” the skill level of the prospective tractor operator. Although not applicable to agriculture, there are two MIOSHA General Industry Standards which could provide guidance to farm owners regarding “testing” the skill level of prospective tractor operators. MIOSHA General Industry Safety Standards, Part 21 - Powered Industrial Trucks and Part 22 – Tractors. The test should check employee knowledge of the equipment, how to inspect the tractor, and their operating ability - can they safely operate the tractor through the functions necessary to perform the required work.

It was apparent to the farm manager that the decedent did not have the ability to back the tractor when the tractor was attached to the trailer; the farm manager indicated he routinely performed these tasks for the decedent.

Farm owners can utilize the [National Safe Tractor and Machinery Operation Program Student Manual](#)'s 2013 edition, page 4 layout of the driving/skills test course as an example to ensure tractor operator's skill to safely and efficiently start a tractor and hitch to a wheeled or 3-point implement and to safely and efficiently drive a tractor pulling a two-wheel implement through a specified course with spaces and borders.

In the skills section, the tractor operator must successfully complete:

- Pre-operational check (tractor & machinery). The pre-operational activities may include:
 - Checking of oil, fuel, cooling fluids, etc.
 - Visual inspection of tires, shields, guards, fasteners, leaks, etc.
 - Demonstrate universal hand signals (ASAE)
 - Safe mounting and dismounting, adjustment of the operator's station, location of controls, etc.
 - Operating Skills
- Operating skills component will include:
 - Starting tractor
 - Backing up tractor
 - Connecting tractor to a machine (PTO, hydraulics, electrical, hitch, etc.)
 - Disconnecting machines
 - Stopping and parking tractor

In the driving section, the tractor operator must successfully complete:

- Operate tractor & machinery through a serpentine driving course, forward & reverse operation, back in & pull out of prescribed space.

Recommendation #4: Farm employers should develop a written farm safe operating procedures (SOPs)/safety rules as part of a safety program and provide employee training regarding both the safety rules and the safety program.

Discussion: The farm did not have a written safety program nor written safety rules and/or standard operating procedures. The owner stated that he provided verbal instruction regarding how to perform tasks, such as setting up the orchard ladders, tractor operation, heat stress, etc. Safety and health written programs can establish and provide procedures, guidelines and documentation for safety practices such as equipment inspection, job task safety, and safety

training. There is no legal requirement in Michigan for a written safety plan in agriculture. A written safety plan can help identify factors that can contribute to an injury, illness, or fatality. In some fatal work-related events, there is a single cause of the fatality. More commonly, as in this tragic incident, a combination of factors contributed: the decedent's reluctance/inability to back the tractor/trailer, the farm manager did not perform this task for the decedent, the faulty emergency (parking) brake, leaving the tractor running when he dismounted, the two-track's downward slope, the weight of the trailer, the location of the unsecured ladders.

MIFACE recommends a written safety plan. Such a plan would identify the safety and health hazards for the farm, so hazard controls could be developed. A safety plan which is communicated to all who work on the farm would help raise awareness of safety issues and promote safe work practices. Additional benefits include increasing work efficiency, and minimizing costs. If there are employees, a written farm safety plan might reduce worker compensation premiums. A safety plan should include work rules, such as how to inspect a piece of equipment and how to transport/move portable equipment. For example, demarcation (e.g. spray paint) or signs could be placed on the trailer indicating locations where the ladders and fruit lugs should be placed. The written SOP should identify how the ladders should be placed on the trailer and the requirements for load securement.

Because each farm is unique, it may be difficult to find a template that exactly matches the farm's enterprises. There are multiple resources a farm owner can utilize to begin development of a farm safety and health program. Among them are:

- [Farm Safety Handbook Template](#) from Rural Mutual Insurance focuses on policies and training for employees.
- [Farm Safety Plan](#) - a customizable handbook from the Agricultural Health and Safety Network in Canada. The Handbook includes Farm Safety Mapping, information about Personal Protective Equipment (PPE), and employee training.
- [Farm Safety Starter Guide](#) from Australia provides templates for farm hazard mapping and examples and templates for risk assessment.
- [Safety Resources](#) from Michigan Farm Bureau's Agricultural Labor and Safety Services (ALSS) program. ALSS has many farm-related safety topics, including farm hazard assessment checklists, emergency preparedness plans, and links to other farm safety issues.
- [Farm Safety Series](#) developed by the University of Idaho Extension Service. Fifteen fact sheets are in both English and Spanish and are designed to help farm and ranch managers conduct employee training on health and safety topics.

ADDITIONAL RESOURCES

- MIFACE Investigation Farmer Starting Tractor From Ground Died When Run Over by Tractor #15MI066. http://www.oem.msu.edu/images/MiFACE/InvestigationReport_Agriculture/15MI066InvestigationReport.pdf
- Michigan Farm Bureau Agricultural Labor and Safety Services. https://www.michfb.com/MI/Farm_Business_Resources/Ag_Labor_and_Safety_Services/Products/Free_Resources/
- Iowa's Center for Agricultural Safety and Health. <https://icash.public-health.uiowa.edu/programs/seasonal-campaigns/farm-safety-planning/>



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- National Safe Tractor and Machinery Operation Program. Penn State Extension.
<https://extension.psu.edu/national-safe-tractor-and-machinery-operation-program#section-4>

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REFERENCES

Weather Underground [2014]. Weather history for nearby weather station. The Weather Channel Interactive, Inc.

MIOSHA standards may be found at and downloaded from the MIOSHA, Michigan Department of Licensing and Regulatory Affairs (LARA) website at: www.michigan.gov/mioshastandards. MIOSHA standards are available for a fee by writing to: Michigan Department of Licensing and Regulatory Affairs, MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or calling (517) 322-1845.

- MIOSHA Administrative Rule Part 11 - Recording And Reporting Of Occupational Injuries And Illnesses
- MIOSHA General Industry Safety Standard, Part 21 – Powered Industrial Trucks.
- MIOSHA Agricultural Safety Standard Part 51 – Agricultural Tractors

ACKNOWLEDGEMENT

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