



## MICHIGAN STATE UNIVERSITY: Prevention of work-related injuries & illnesses through research & investigation

### FARMERS AND TREES: TASKS THAT CAN KILL

Farmer Tree Hazard Alert  
9/23/2020

Tree work is a common but non-routine task on farms. Using machines designed for farming or property maintenance rather than machines designed for working in the woods increases the risk for farmers when clearing land and fence rows and hauling felled trees. Chainsaw use when cutting down trees and limbing/bucking a felled tree is often performed by untrained or inexperienced individuals. **Working with trees is not a “common sense” activity and requires a full understanding of the task before it is undertaken** so as to minimize the risk of injury or death.



From 2001-2018, thirty (30) farmers, farm workers, and farm property owners have been killed in a tree-related fatality. Twenty-two of the 30 deaths (73.3%) occurred while the individual directly worked with a tree: eight were using a chainsaw to fell the tree and three to trim a felled tree and 11 died while moving a downed tree with a piece of equipment, six by pulling/hauling and five by pushing the tree. Four (13.3%) individuals died when the tractor they were operating ran over a hidden stump (3 deaths) or a branch (1 death). Other tree-related deaths included: unloading a tree stump from a flatbed using a tractor (causing the tractor to tip over), a tractor hitting trees while turning in a field, a farmer operating a skidder was struck by a falling tree, and an electrocution while preparing trees for market.

### FATALITY NARRATIVE EXAMPLES

- A farmer in his 50s died when a box elder tree he was felling split vertically, with the split section striking his back.
- A farmer in his 60s died when his tractor tipped backwards while attempting to haul a tree, crushing him between the three-point hitch and the fender of the tractor.
- A farmer in his 80s died when a branch struck him after he attempted to use his bulldozer to push down a tree still connected to its root ball. The tree snapped back and struck him.
- A 23-year-old male dairy farmer died when a tree he was felling landed on him.
- A farmer in his 50s died when his tractor rolled over onto him after hitting a stump that was hidden under weeds in the brush.
- A man in his 60s died while attempting to pull a large tree by hooking a chain to the top of the tree, causing his tractor to overturn and pin him between the tractor seat and the ground.
- A farmer in his 60s died when he was struck by the tractor he was using to support/push a tree he was cutting down with a chainsaw. The tractor was positioned uphill of the tree.

# PREVENTION RECOMMENDATIONS

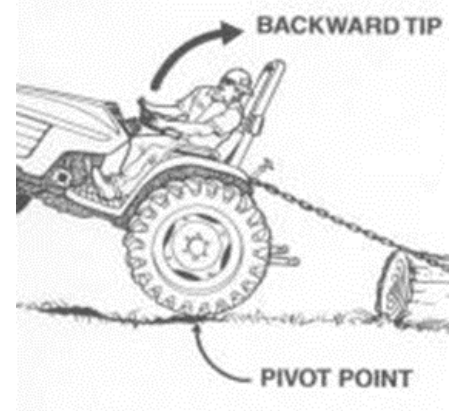
A common thread in Michigan agricultural tree-related fatalities is the irregular nature of the work task being done and the equipment being used. An **enclosed rollover protective structure (ROPS) with a hard roof or a falling object protective structure (FOPS) with protective rear, side and front grills, is recommended** to protect equipment operators. (See Did You Know Box for how to protect the tractor.) To perform tree-related tasks safely requires a review of the equipment to be used, the physical nature of the tree in relation to the intended activity, “escape” and/or other planning, hazard recognition and abatement strategies, necessary safety practices, and proper personal protective equipment (PPE). Every tree activity has a different set of hazards. Although farmer owner/operators are not required to meet the [MIOSHA Part 51 Logging Standard](#), the standard along with your equipment operator’s manual, and industry training guidance provide useful information to minimize the risk.

## Recommendations for Recognizing and Avoiding Key Hazards:

- **Pulling trees**

- Overturn

- Hitching above the draw bar (or manufacturer’s recommended attachment point ) increases the “angle of pull”, increases the leverage of the load being pulled, and increases the pressure of the tires against the ground, reducing the safety design of the tractor and increasing the risk of an overturn
- Never attach a load directly to the axle
- Consider hooking a chain to the hook on the loader bucket and run in reverse



- Ensure the tractor has adequate capability to perform the task
- Select a proper steel cable/log chain (strength and length) and method of load securement
  - Use slider hooks or bell chokers and place within one foot of the end of the log
  - Too long of a chain can get caught in rear tires
- Ensure load alignment is directly behind the tractor
- Do not apply power too quickly to a tractor’s rear wheels
- Take extra caution when working uphill or when the front wheels are not level
  - Changes in the tractor’s configuration, attachments, ballast, loading, and orientation relative to a slope change the overall stability of the combination in use

- **Pushing trees**

- Recognize hazards associated with tree characteristics (e.g., length, weight), soil conditions, and undergrowth

- E.g. Structurally unstable, dead, or lodged trees/branches; the direction of tree lean; small trees or limbs bent under the weight of a larger tree which has fallen upon them; tree falls that are still partially attached to the tree; a stump or limbs impaled into ground



- Use a sufficient brush guard or attached vertical back structures on equipment
  - This will help protect from an object rolling up over the attachment into the operator area
  - Remember: although a tractor equipped with a bucket can push materials around, a bucket is built to *lift* materials rather than like a bulldozer *to push* materials
- Beware the sudden release of tree parts under compression or tension.



- **Felling trees**

- Take time to note tree characteristics, soil conditions, and root ball size and potential hazards such as structurally unstable, dead, or lodged trees/branches; direction of tree lean
- Follow safe chain saw use guidelines including adequate PPE
- Ensure an escape route is planned in case of the tree falling in an unexpected direction or fashion
- Follow best practices for creating proper hinge cuts (see MIOSHA Logging Standard)
- If working at a height is required, ensure ladders, aerial lifts/elevated work platforms, and/or harnesses and tools are appropriate for the work and are in good working condition

- **Limbing and Bucking**

- Limbs impaled into the ground tend to react differently on “ag soil” verses “forest soil”
  - “Ag soil” can be more compacted increasing impaled limb compression/tension forces
- Place a “backstop” of trunk section where there are impaled limbs to minimize tree movement (such as appropriately chaining the tree to a tractor, blocking or supported by a loader, or backing the tractor up to the trunk from the cutting side)
- Beware of the sudden release or rebound of twisted, lodged, or compressed limbs, other tree parts, or saplings
- Follow safe chain saw use guidelines including adequate PPE

- **General Movement (equipment and personal)**

- Pay attention to uneven surfaces
- Look out for hidden obstacles (e.g., stumps not cut flush with ground (or removed or ground down) or fallen limbs in overgrown areas)
- Take note of any potential for contact with powerlines.
- Ensure the availability of PPE



#### DID YOU KNOW?

- Minimum farm tractor protection modifications when used for tree work:
  - radiator shield
  - front end weights
  - steel skid plate to protect the tractor’s underside and allow it to “slide” over stumps or rocks
  - spark arrestor for the muffler
  - fire extinguisher
  - tire chains
  - shield for tire valve stems
- **All** Michigan tractor operators who died in a tractor rear or side overturn were operating tractors that were not equipped with a roll over protection structure (ROPS)
- A tractor rear overturn can occur in less than one second
- A clearing house to find a ROPS for your tractor can be found [here](#)
- Chainsaws can kickback after catching on something in the tree
- Professional chainsaw training is available – On-the-Job training is not considered professional training

#### Resources

- MIFACE [Agricultural Investigation Reports](#)
- MIOSHA General Industry Safety and Health Standard, [Part 51 Logging](#)
- OSHA
  - [Logging e-tool](#)
  - Tree Care Industry Safety and Health Topics [webpage](#)
  - OSHA Hazard Bulletin: [Tree Care Work: Falls and Falling Object Hazards](#)
  - [Working Safely with Chainsaws](#)
- National Ag Safety Database:
  - [Logging Safety](#)
  - [Logger Safety Initiative Safety Training – Accident Prevention Program for Cutting Operations](#)
- Penn State Extension: [Tractors in the Woods](#)
- Virginia Cooperative Extension: [Farm Tractor Logging for Woodlot Owners](#)
- Washington State Department of Labor and Industries. [Danger: Chainsaw](#) video
- State of California: [Tree Work Safety](#)