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Tractors in the Woods

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Harvesting timber, clearing land and fence rows, and cutting and transporting firewood are common tasks on farms and rural property. When done by trained loggers or foresters using machines designed for working in the woods, these tasks can be done with minimal risk. But when attempted by untrained or inexperienced farmers or rural property owners using machines designed for farming or property maintenance, the same tasks have an increased risk of a serious injury or fatality.

Pennsylvania farm fatality reports from recent years have identified numerous fatalities involving tractors that were being used for pulling down trees and limbs, pulling tree stumps, dragging logs, clearing saplings and brush from fence rows, or for collecting and hauling firewood. For example, one farmer was killed when the log he was dragging from the woods caught the edge of a field's dead furrow and pulled the tractor over backwards onto him. Over 50% of these incidents involved tractor upsets while dragging trees, logs, tree tops, or brush. Nearly forty percent of the incidents involved falling trees due to lodged trees, wind gusts, or falling limbs (widow makers) from overhead. The remaining fatalities involved chain saw kick-back.

The purposes of this fact sheet are to: 1) review hazards and safety recommendations that farm and rural landowners should consider when planning to clear fence rows, cut firewood, or transport farm wood products; and 2) identify the differences between logging equipment and the farm tractor.

Recognize Hazardous Trees

One way to increase safety is to be aware of hazardous situations associated with trees. For example, *danger trees* present a hazard to persons due to conditions of the tree such as deterioration or physical damage, and the direction of lean of the tree. Snags are standing dead trees. They are very unpredictable and can easily be caused to fall. Lightning and storm damaged trees, and trees damaged through logging operations may have broken limbs resting in the canopy. These are called widow makers and they can fall without warning (see Figure 1 on pg. 2). Trees with portions of disease or rot, such as a dead limb, or that are lodged or hung up on another tree can also drop unexpectedly. These overhead hazards can drop at any time.

Spring poles are small trees or limbs bent under the weight of a larger tree which has fallen upon them (See Figure 2 on pg. 2). If these are improperly or mistakenly cut they can release with lightning speed and yield a fatal blow to bystanders.

Leaning trees pose special felling skills. A severely leaning tree may twist and fall in an unplanned direction. Recognize the dangers each situation can present and plan your cutting work accordingly. Workers should inspect trees along the edge of the woods and fence rows, along woods roads and trails plus other wooded locations for danger trees. Do not fell trees within a two (2) tree height distance of a danger tree. You may unknowingly create further hazards by working near the danger tree. Secure the services of a trained professional who has experience dealing with danger tree environments.

Figure 1. Example of a widow maker.

Figure 2. Example of a spring pole.

Farm Tractors: Not Recommended for Woodlots

While farm tractors can be used safely for a variety of purposes, using them in the woodlot poses significant risk and is not recommended. Most farm tractors are not appropriately equipped for use in woodlots and this directly contributes to many fatal injury incidents. It is important to understand the differences between a farm tractor and heavy duty logging equipment found in the timber industry.

Farm tractors are not equipped for woodlot tasks. If the tractor is small enough to maneuver between trees and stumps, it probably lacks the power or stability to safely do the work. If the tractor is large enough to do the work, it may not fit under low hanging branches or between trees and stumps. Additionally the typical farm tractor will be missing some key components that protect not only the operator, but the tractor itself. Even if the tractor is equipped with a ROPS, protection from falling trees or limbs or branches that may poke into or intrude into the operator space is inadequate.

Here are the components of a timber harvest "tractor" (usually called skidders), that are missing on a typical farm tractor (See Figures 3 and 4):

- A heavy steel skid plate to protect the machine's underside and allow it to "slide" over stumps and rocks
- Protective grill for the radiator
- Engine side guards
- 10-12 ply, flat-sidewalled tires with valve protection plates welded to the rims and rim to tire securement
- Tire chains for soft ground or snowy, icy conditions
- Front-end weights to improve stability during dragging of logs
- A 10 lb. ABC fire extinguisher
- A spark arrester exhaust system
- A Category II FOPS* (falling object protective structure) with seat belt
- A protective grill for the rear window of the FOPS cab to prevent winch cables and hooks from flying through the back of the cab

Figure 3. A typical farm tractor lacks necessary safety features to safely enter the woods for timbering activities.

Figures 4. The typical logging "tractor" or skidder is a more rugged machine with safety features that protect the machine and operator.

- Protective side grills in the FOPS to prevent poking/ intrusion hazards
- Higher ground clearance
- Lateral stability due to axle rotational allowances
- Nearly equal front/rear axle weight distribution

*Category II FOPS meet OSHA requirements and have been ISO (International Standards Organization) tested to withstand penetration into the operator cab of a 500 lb. weight dropped from 17 feet.

Tractor manufacturers producing farm and timber equipment have manufactured their products for safe use in specific applications. The intended use of farm tractors when used in woods management activities should be limited to specific applications such as fire wood transport or stationary work, such as log splitting, propulsion, or operating elements with PTO, hydraulic, or electrical systems. Any forestry applications, such as pushing, dragging and loading of logs, should be left to logging machines. Retrofitting normal farm tractors for timber harvest operations, even when technically possible, would likely prove to be cost prohibitive. Planning for logging activities should include safety considerations including specialized training for that task, using equipment designed for the job, and evaluating the use of contractors equipped and trained to do the logging or clearing work needed.

Hazards of Dragging and Pulling Stumps, Logs and Limbs

In addition to farm tractors being ill-equipped to work safely in the woods, descriptions of fatal injury incidents suggest many people engage in unsafe work practices with their tractors in the woods. As mentioned earlier, over 50% of the fatal incidents in Pennsylvania involved farm tractors overturning from dragging or pulling trees, logs, and limbs. If this task is not approached correctly, numerous hazards to the operator are created. For example, attaching a chain or cable to a point higher on the tractor than the drawbar increases the risks of a rear overturn if a log catches on a rock, stump, or ground depression (See Figures 5 and 6). Soft, muddy soil can increase the loading on the tractor and contribute to the overturn as well. The tractor can rear over backwards in less than a second. Running over a stump, rock or tree trunk with one rear tire, especially while already on sloped ground or turning, increases the risk of a side overturn (see Figure 7). Additionally, logs, when pulled across a slope, can roll to the side with great force with an increased risk of tractor rollover.

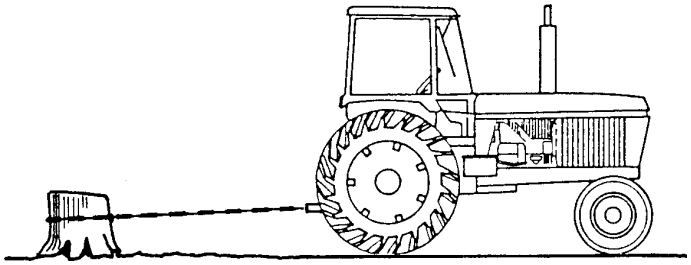

Figure 5. An example of safe hitching. The drawbar will lower if the front end rises. This reduces the risk of a rear overturn.

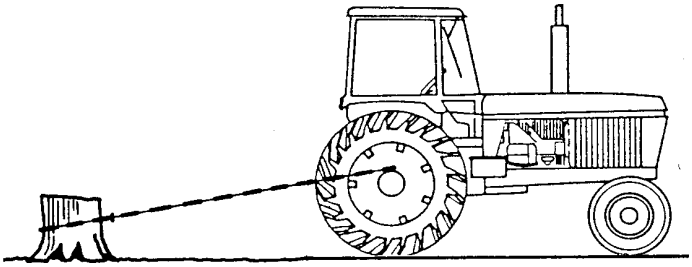

Figure 6. An example of unsafe hitching. The attachment point does not lower if the front end rises, increasing the risk of a rear overturn.

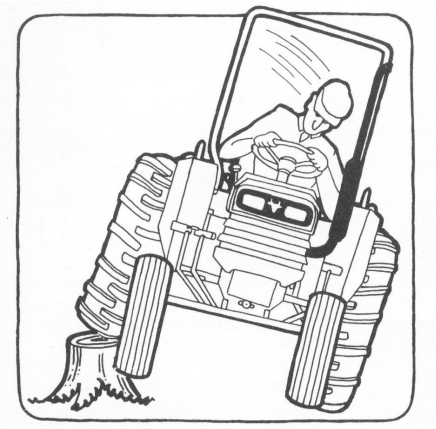

Figure 7. Should the rear wheel run over a stump, the center of gravity shifts toward the side stability baseline, increasing the risk of a side overturn.

Attempting to drag logs or to pull or push limbs down with a front-end loader can also be hazardous, especially if the bucket is raised high to accomplish the task. Raising the bucket raises the center of gravity of the tractor allowing the tractor to tip over sideways more quickly. A front-end loader also moves the center of gravity forward. Raising a bucket and pushing on limbs or tree trunks applies elevated forces that readily overturn almost any farm tractor. Review Fact Sheet E 34, *Tractor Overturn Hazards,* for a full explanation of the principles regarding tractor overturn hazards.

Dragging and Pulling

Not all tree cutting activity takes place deep in the woods. Cleaning up fence rows or expanding field acreage by cutting trees is common. These trees may be felled safely, but still must be dragged for processing for firewood or burning.

There are equipment and practices that significantly increase the safety of dragging and pulling logs and trees with farm tractors. Skid cones, log arches, 3-pt. mounted grapples and 3-pt winch equipped skidding implements can be reasonably purchased for use (See Figures 8 and 9). Any device which prevents the log from twisting or rolling out of control while being dragged will increase safety to the operator.

Log dragging practices that reduce risk are:

- Only use tractors with FOPS-protection. If the tractor has a ROPS cab, a protective grill should cover the rear window. If the tractor uses a 4-post type of FOPS, the rear opening should be covered with a grill (See Figure 9, right side tractor).
- Use slider hooks or bell chokers to attach to the log and place them within one foot of the end of the log to reduce the need to re-choke the log and to insure they will stay in place.
- If only chains are used for dragging logs, the chain should be attached only to the drawbar.
- Chains being used for dragging logs should not be so long that they will catch on the rear tire when the tractor is turning right or left.
- Be sure that on-the-ground helpers are clear of logs and cable before winching or dragging logs
- Use of arches, grapples and winches are much preferred for any dragging operation (See Figures 8 and 9).
- If log arches, grapples or winches are used, their size needs to match the size and power of the tractor. Be sure to check manufacturer's recommendations.
- With PTO driven winches, be sure to keep PTO guards in place.
- Use a remote controlled winch to prevent winch cables

and chokers from striking the operator should the cable or choker fail.
- Lower all 3-pt mounted equipment and lock brakes before dismounting the tractor.
- Inspect and replace damaged cable. Ensure cable splices, hooks and eyes are installed correctly and that these components have the same strength standards as the cable.
- Use personal protective equipment of hard hat, eye protection, steel-toed work boots and leather gloves when dragging logs and working with steel cable.

Chain Saw Reminders

No one needs a certificate of training to purchase a chain saw. Yet these tools are powerful and potentially lethal. Chain saw kick-backs from improper use results in traumatic injury and death. Fire hazards exist if re-fueling is not done correctly. Log sections can roll onto the chain saw operator or helper who stands in the wrong position. Take time to get training in chain saw use. Chain saw manufacturer's have excellent training videos and other resources you can access. Operator's manuals are a good place to start, but asking for a knowledgeable person to demonstrate chain saw use to you is even better. Best yet, consider using fully insured, trained professionals to do the clearing work for you.

Summary

Hazards exist in working in our farm woods. Danger trees exist in all wooded areas. They can fall or be blown over at any time regardless of your activity. Recognize these trees and what they look like.

The standard farm tractor is not equipped to minimize hazard exposures to the operator or damage to the tractor during woods work. Some operational practices by tractor operators handling trees and logs add risk of injury to them and to their tractor. Farm tractors cannot be reasonably and economically modified to adequately increase their safe use in the woods. Farm and rural land owners should carefully consider and evaluate: a) their need to cut down trees, move logs and clear land; b) hazard recognition and abatement strategies; c) required safety practices, and d) budgeting for professional timbering services before beginning farm woods activities.

Deciding to cut specific trees for whatever purpose exposes the operator to chain saw injury or death. Take time to become a safe chain saw operator or use a trained person's talents to work for you.

Remember that farm tractors are not recommended for forest or woods activities.

References

Summary of Fatal Farm Incidents, Pennsylvania. See www.agsafety.psu.edu/Injurydatastats.html

Figure 8. A log arch, fetching arch or sulky lifts the end of the log being dragged to keep it from digging into the earth, rocks, roots, or stumps.

Figure 9. Examples of a 3-point mounted grapple and a 3-point mounted winch for safely moving logs. The tractor on the right is shown with a metal grill.

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