MIFACE INVESTIGATION REPORT #12MI033

SUBJECT: Handyman Died When Tree He Was Felling Split Vertically and Struck Him

Summary

In winter 2012 a male handyman in his late 50s died when a 3-4 foot diameter box elder tree growing at a 45-degree angle "barber-chaired", and the vertically split section broke away from the tree and struck him. The decedent had been hired by a farmer to cut down the tree bcause it was growing over and into the field. Using a chainsaw to fell the tree, the decedent made a horizontal 6-inch cut approximately 3 feet up from the ground. The tree split vertically at the location of the cut to the top part of the tree. The split piece came away from the tree, striking the decedent. The remainder of the tree was still standing. The farmer, who was working in the field at the time of the incident, came to investigate when he saw the tree move unexpectedly. The farmer found the decedent in a sitting position, pinned face first to the ground with the split piece of wood on his back and called for emergency response. The decedent was declared dead at the scene.

Figure 1. Incident scene showing tree that barber-chaired and location of decedent.

Factors which may have contributed to this fatal incident include:

- The amount of lean of the tree
- Improper felling technique

RECOMMENDATIONS

- Tree fellers should conduct a tree assessment prior to felling activities which include tree species hazards, lean of tree, etc.
- Fellers should utilize appropriate felling techniques based on the results of the tree assessment.

OVERVIEW

In winter 2012 a male handyman in his late 50s died when a 3-4 foot diameter box elder tree growing at a 45-degree angle "barber-chaired", and the vertically split section broke away from the tree and struck him. MIFACE learned of this fatal incident from a newspaper clipping. The decedent's wife was contacted and agreed to participate in the MIFACE research program. On the day of the site visit, MIFACE also spoke with the farmer who hired the decedent. In the course of writing this report, the death certificate, police report and medical examiner's report were reviewed. Figure 1 is courtesy of the responding police department. Figure 2 is courtesy of the OSHA Logging e-tool.

The decedent had recently retired from another place of employment. He had worked periodically for the farmer that had hired him to cut down the tree. The decedent had grown up on a farm and was familiar with farm work activities. He had successfully, and without incident, cut down several trees on the farm property and his own personal property.

His spouse indicated the decedent took very good care of his tools and prided himself on the condition of his tools.

INVESTIGATION

The incident scene was a short distance from the bank of a drainage ditch. Earlier in the day, the farmer who hired the decedent came by the decedent's home and asked if he had time to come over to the farm to cut down the tree. The decedent indicated he had time, and arrived at the property later that day.

Figure 2. Picture of a tree barber-chair.

The decedent walked to the tree's location. Using a chainsaw to fell the tree, the decedent made a horizontal 6-inch cut approximately 3 feet up from the ground to the top part of the tree. He did not make a cut to the underside of the tree. The tree barber-chaired at the location of the cut. A barber-chair is the splitting of the butt of the log during the latter part of the fall.

In this incident, the tree did not remain attached to the stump (see Figure 2) - the split piece came away from the tree, striking the decedent. The wood came to rest on his back. The decedent was in a sitting position and pinned face first to the ground. The remainder of the tree was still standing (Figure 1). His chainsaw was lying next to him.

The farmer was riding on his tractor in the field to the north of the decedent when the tree fell. He stated to the MIFACE researcher that the tree fell in a different direction than it was supposed to fall, so he went to check on the decedent and found him under the split section of tree. The farmer called for emergency response.

CAUSE OF DEATH

The cause of death as noted on the death certificate was blunt force chest trauma. Blood toxicology was negative for alcohol and illicit drugs.

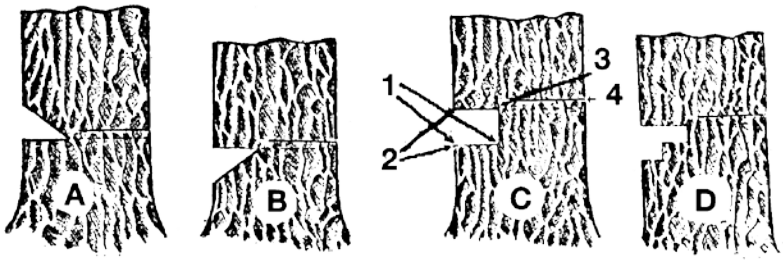
RECOMMENDATIONS/DISCUSSION

- Tree fellers should conduct a tree assessment prior to felling activities which include tree species hazards, lean of tree, etc.

Before felling a tree, the feller should consider carefully all conditions which may affect the issues involved in felling the tree, including but not limited to: the intended direction of the fall, the natural lean of the tree, any unusually heavy limb structure, surrounding trees and obstacles, and wind direction and speed. In this incident, the tree had a very significant forward lean (i.e. leaning in the direction one wants the tree to fall), which placed the tree under tension.

A leaning tree may have abnormal wood, identified as reaction wood. Reaction wood is of two types: softwoods form *compression* wood on the underside of leaning stems, while hardwoods form *tension* wood on the upper side of the stem. Compression and tension wood are chemically and structurally different from normal wood. The box elder tree is considered a type of maple (Acer genus) and is considered a hardwood.

MIOSHA General Industry Safety Standards, Part 51 – Logging and Part 53 – Tree Trimming and Removal and can be consulted for additional information on tree assessment, hazard trees, and appropriate felling techniques, including notches and back cuts. For example, Part 53 Rule 5336 contains both text and pictorial guidance on approved undercuts.



A. Conventional undercut. Can be made with parallel saw cut and axe diagonal cut or both cuts with the saw. Generally used on trees of small diameter.

B. Both cuts made with the saw. Leaves square-end log. Same as “A”, except that waste is put on the stump.

C. Two parallel cuts with the saw. The material between the cuts is chipped out with an axe-adze (pulaski) combination. Used on trees over 30" in diameter.

D. Three parallel cuts with the saw, leaving a step. Same in principle as above. Used on trees of very large diameters.

- Fellers should utilize appropriate felling techniques based on the results of the tree assessment.

This tree had a very significant forward lean and necessitated a different felling approach than the technique with which the decedent may have been familiar. The decedent made a straight cut to the side opposite the lean of the tree, which was a factor in the tree "barber-chair" and subsequently, his death.

Instead of a straight cut to the opposite side of the tree, to fell a tree with a significant lean, an open face notch ***made on the side of the tree that faces the direction you want it to fall*** should be utilized. An open face notch requires a cut downward at an angle of 70 degrees on the tree, stopping when the cut reaches 1/4 to 1/3 of the trunk's diameter or when the cut reaches 80% of the tree's diameter at breast height. Using a chain saw running at maximum RPM, the feller should make a bore (or plunge) cut (through the tree) using the attack corner of the chain saw bar to help release the tree tension due to the lean. The feller should also ensure that he makes the bore cut from the side away from the lean, leaving enough holding wood (hinge wood) so the tree does not release prematurely. Then the feller should make the back cut below the bore cut, leaving a strap of uncut wood at the back of the tree to hold the tree in place and prevent it from falling until the feller is ready to make the final cut.

REFERENCES

MIOSHA standards cited in this report 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 (LARA), MIOSHA Standards Section, P.O. Box 30643, Lansing, Michigan 48909-8143 or calling (517) 322-1845.

- MIOSHA General Industry Safety Standard, Part 51 – Logging
- MIOSHA General Industry Safety Standard, Part 53 – Tree Trimming and Removal
- The Wood Database. http://www.wood-database.com/lumber-identification/hardwoods/box-elder/
- U.S. Department of Labor. Logging e-tool. https://www.osha.gov/SLTC/etools/logging/manual/felling/cuts/notches.html
- University of Tennessee Extension. "Are Fast Grown Trees of Low Quality". https://utextension.tennessee.edu/publications/Documents/W253.pdf
- Great Lakes Timber Professionals Association. FISTA Report: Cutting Heavy Leaners. http://timberpa.com/feature-article/fista-report-cutting-heavy-leaners

KEY WORDS: Logging, Tree Felling, Leaning Tree, Box Elder, Agriculture

 October 1, 2013