

Case Study Student Activity-Answer Key

Timber Cutter Dies After Being Struck From Behind by a Tree Which Became Entangled with the Tree He was Felling in West Virginia

West Virginia Case Report: 04WV001-01

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Summary

On January 6, 2004, a 68-year-old male tree feller (victim) died of injuries sustained when he was struck from behind by a tree which became entangled with the tree he was felling. He was in the process of felling a 65 foot red oak with substantial back lean. As he began cutting the tree, the victim did not use a hinge to control the fell and wedge to compensate for back lean. He was unable to use his wedge because it became buried under the butt of the tree he had felled earlier. As he finished his final cut, the tree set back and began falling opposite of the intended direction. Accordingly, he changed his escape path and retreated in the opposite direction. He stood approximately 12 feet from the stump to watch the fell, but as the tree fell, its top became entangled with a small diameter 70 foot tall black birch whose root system was weak. The oak pulled the birch over, striking the victim from behind. Witnessing the incident, his son responded by running down to the victim, cutting the birch off of him, and lying him down. Realizing the extent of his father's injuries, the son went to the landing and told a log truck driver to call 911. The driver stayed with the victim while the son waited to direct the ambulance. Approximately 30 minutes passed from the time of the incident until EMS arrived. The victim died shortly after their arrival and was transported to the nearest medical facility where he was pronounced dead.

The WV FACE Investigator concluded that, to reduce the likelihood of similar occurrences, employers should:

- ensure that tree fellers utilize proper directional felling techniques.
- ensure that tree fellers utilize felling wedges in addition to proper felling techniques on trees with back lean.

Introduction

On January 6, 2004, a 68-year-old male tree feller (victim) died of injuries sustained when he was struck from behind by a tree which became entangled with the tree he was felling. On January 7, 2004, the West Virginia FACE Investigator was notified of the death by the West Virginia Division of Forestry (WVDOF). The incident was reviewed with the WVDOF representative, who then accompanied the Investigator to the site where an investigation was conducted on January 9, 2004. The victim's son, who

witnessed the incident, was interviewed. The incident site was examined and photographed. Other informational sources and contacts included: death certificate, newspaper articles, WVDOF, and Occupational Safety and Health Administration (OSHA).

The logging operation was a father and son partnership. The land was privately-owned. The father had cut off of the land each year for the past 11 years.

The victim held Certified Logger status in West Virginia and the operation had the required DOF applications and subsequent approvals. [Note: The Logging Sediment Control Act of West Virginia (1992) requires that each timbering operation in West Virginia be supervised by a certified logger. To become a certified logger, an individual is required to successfully complete training and pass a test for best management practices (a soil erosion prevention plan) and chain saw safety as well as possess a current first aid card.¹]

There was no formal safety program and company safety officer. The victim's son did not indicate that formal company-specific training was provided. It was reported that the victim was a careful worker.

The victim's job at the time of the incident was felling trees. He had been a felling timber for at least eleven years. It was reported he had always used a wedge to ensure fell direction on almost every tree. At the time of the incident, the victim was wearing a hard hat, eye protection, hearing protection, chaps and chainsaw resistant boots.

Investigation

On January 6, 2004, a 68-year-old male tree feller (victim) died of injuries sustained when he was struck from behind by a tree which became entangled with the tree he was felling. He was in the process of felling a 65 foot red oak with substantial back lean (see [Figure 1](#)). As he began cutting the tree, the victim did not use a hinge to control the fell and wedge to compensate for back lean (see [Figure 2](#)). He was unable to use his wedge because it became buried under the butt of the tree he had felled earlier. As he finished his final cut, the tree set back and began falling opposite of the intended direction. Accordingly, he changed his escape path and retreated in the opposite direction. He stood approximately 12 feet from the stump to watch the fell (see [Figure 3](#)). As the tree fell, its top became entangled with a small diameter 70 foot tall black birch whose root system was weak (see [Figure 4](#)). The oak pulled the birch over, striking the victim from behind (see [Figure 5](#)). Witnessing the incident, his son responded by running down to the victim, cutting the birch off of him, and lying him down. Realizing the extent of his father's injuries, the son went to the landing and told a log truck driver to call 911. The driver stayed with the victim while the son waited to direct the ambulance. Approximately 30 minutes passed from the time of the incident until EMS arrived. The victim died shortly after their arrival and was transported to the nearest medical facility where he was pronounced dead.

Cause of Death

The medical examiner's report listed the immediate cause of death as multiple blunt force traumatic injuries.

Recommendations/Discussion

Recommendation # 1: Employers should ensure that tree fellers utilize proper directional felling techniques.

Discussion: *Directional felling is the safest manual felling method of getting trees on the ground. The proper notch directs the tree's fall and the hinge wood keeps the tree under control as it falls. CFR 1910.266h(2)(v) requires that a directional undercut be made or face notch, and 1910.266h(2)(vi) requires that a back cut be made leaving sufficient hinge wood to hold the tree to the stump during most of its fall so the hinge is able to guide the tree's fall in the intended direction.² The West Virginia Logger's Safety Field Guide also recommends the use of proper directional felling techniques.³ The victim did not utilize directional felling techniques. All control over felling direction is lost if there is no hinge wood. Having established a proper face notch as well as the proper amount of hinge wood, may have ensured that the tree would have fallen in its intended down hill direction (see [Appendix A](#)).*

Recommendation # 2: Employers should ensure that tree fellers utilize felling wedges in addition to proper felling techniques on trees with back lean.

Discussion: *Trees with back lean should be wedged to fall in the desired direction. After establishing an open faced notch and determining the required amount of hinge wood, the feller should begin the back cut. As soon as the back cut is deep enough, a wedge should be driven into the cut. The back cut should continue leaving a hinge at least 1/10 the tree's diameter. When the back cut is complete the tree should start to fall. If not, felling may be aided by driving the wedge further into the cut. In this incident, the victim was unable to use his wedge because it became buried under the butt of the tree he had felled earlier. Tree cutters should realize the importance of making sure they carry extra wedges. Having implemented the use of a wedge to safely fell this tree may have ensured that the tree would have fallen in its intended direction and therefore not entangling other trees in the area.*

Note: *When using the bore cut and release, the wedge should be driven into the chainsaw cut on the side of the release tab which has the tree's weighted side lean (bad side).*

References

1. *West Virginia Logging Sediment Control Act, 1992.*
2. *Office of the Federal Register: Federal Register, Vol. 59, No. 196, 29 CAR 1910.266, 1995.*
3. *West Virginia Logger's Safety Field Guide, West Virginia University-Center for Rural Emergency Medicine (WVUCREM), 2002.*

Illustrations



Figure 1 The photo shows the butt of the felled tree. Note the degree of back lean. The arrow represents the intended direction of the fell from the stump.



Figure 2. The photo shows the tree's



Figure 3. The photo shows the victim's

stump. The white arrow points to the bypass cut on the bottom of the face notch. The bypass completely eliminated any hinge wood.



Figure 4. The photo shows the weak root system and the associated root wad of the tree which was pulled over onto the victim due to entanglement. From this perspective, the victim would have had been viewed from behind and located approximately 12 feet from the root wad. The arrow in the background indicates his approximate position

position when struck-by the birch.



Figure 5. The photo shows the victim's position when struck-by the birch.

Appendix

Why a Felling Hinge?

1. *It provides controlled directional felling.*
2. *It holds the tree to the stump during most of the tree's fall.*
3. *It guides the tree in the intended direction.*
4. *It makes things more predictable!*

The Following Describes a Proper Hinge:

1. *The length of the hinge should be 80% of the diameter of the tree.*
2. *Example: For a 20 inch tree the hinge should be 16 inches long (20 inches x 0.8 = 16 inches).*
3. *The width of the hinge should be 10% of the diameter of the tree.*
4. *Example: For a 20 inch diameter tree the hinge should be 2 inches wide (20 inches x 0.1 = 2 inches).*

