

MINNESOTA SAFETY HAZARD ALERT

Minnesota Department of Labor and Industry
Occupational Safety and Health Division
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St. Paul, MN 55155
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Tree felling

Initiative

Each year, the Minnesota Occupational Safety and Health Division (OSHA) investigates accidents that result from improper tree felling. Although manual tree felling is recognized as the most hazardous job in logging, the task of cutting down trees is not restricted to logging operations alone. Groups such as city maintenance crews, summer camp organizations, home builders and fire wood contractors may also be involved in tree felling and removal.

The purpose of this Minnesota OSHA Hazard Alert is to heighten public awareness of the proper technique for manually cutting down trees.

Description of the hazard

Typically, the root cause of most accidents during a tree-felling operation is an improper cut. Felling a tree consists of a notch, or undercut, followed by a backcut. It is not unusual to see the backcut almost completely through the tree or below the notch. This can result in the base of the tree kicking up, striking and sometimes landing on the individual cutting down the tree.

Controlling and eliminating the hazard

The OSHA Logging Operations standard requires backcuts be at or slightly above the level of the horizontal face of the notch. (The preferable method is the open-faced notch.) This technique is called creating a "hinge." A hinge is required by the logging standard to keep the base of the tree attached to the stump when the tree is felled and to guide the tree's fall in the intended direction.

The logging standard states, "The backcut shall leave sufficient hinge wood to hold the tree to the stump during most of its fall so that the hinge is able to guide the tree's fall in the intended direction ... the backcut shall be above the level of the horizontal facecut in order to provide an adequate platform to prevent kickback." See the diagrams on the next page.

For more information

Employers and employees with questions or concerns can refer to the federal OSHA Web site at www.osha.gov or call MNOSHA Compliance at (651) 284-5050, toll-free at 1-877-470-6742. For more information about requirements and recommendations, refer to 29 CFR 1910.266 (h)(2)(vi) and 29 CFR 1910.266 (h)(2)(vii).

Preferred method

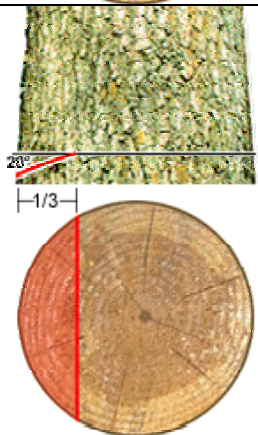
The top cut is the first of two cuts that result in an open-faced notch. The notch is made on the side of the tree that faces the direction the tree is to fall.

- 1. Starting point:**
Begin at any height, allowing enough room for the undercut.
- 2. Angle of attack:**
Cut downward at an angle of 70° .
- 3. Ending point:**
Stop when the cut reaches one-fourth to one-third of the trunk's diameter or when the cut reaches 80 percent of the tree's diameter at chest level.



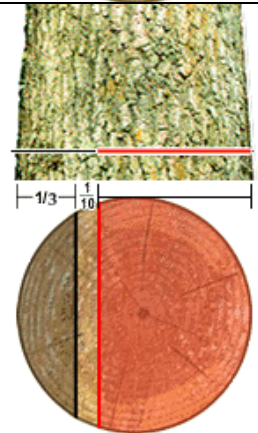
The bottom or under cut is the second of two cuts that result in an open-faced notch. The notch is made on the side of the tree facing the direction you want it to fall.

- 1. Starting point:**
Begin at the level that will create at least a 70° notch opening.
- 2. Angle of attack:**
Cut upward at a 20° angle.
- 3. Ending point:**
Stop when the cut reaches the end point of the face cut. Ideally, this should create a 90° notch opening.



The back cut is the third and final cut and is made on the opposite side of the notch. The back cut disconnects almost all of the tree from the stump leaving a *hinge* that helps to control the tree's fall.

- 1. Starting point:**
Begin on the opposite side of the notch, slightly above the notched corner.
- 2. Angle of attack:**
Cut flat along a horizontal plane.
- 3. Ending point:**
Stop at the point that will leave a hinge width that is one-tenth the tree's diameter.



Acknowledgements

The principal contributors to this Minnesota OSHA Safety Hazard Alert were Jeff Isakson and Cheryl Urie with the Minnesota OSHA Duluth Area Office. Diagrams were retrieved from the *Logging eTool* found on the federal OSHA Web site at www.osha.gov/SLTC/etools/logging/mainpage.html.