

Technical Felling

By Michael Tain

Technical felling is a term used to describe the techniques and methods used to carry out the five-step felling plan discussed previously (see Jan/Feb *Arbor Age*, page 10). Although the plan itself is of vital importance, the techniques and methods of technical felling, once practiced and put into use, are what really allow the plan to be carried out safely, effectively, and efficiently. The use of technical felling skills, in conjunction with a well-designed and appropriate five-step felling plan, will help tree care professionals put wood, branches or trees precisely where they wish it to end up, in a controlled fashion, whether aloft or on the ground. As with any new tool or technique, knowledge alone, though certainly important and beneficial, is not nearly enough; and climbing arborists must always strive to train and practice with technical felling skills prior to employing them in “real world” situations. However, once an understanding of how these technical methods work and how they can be safely employed is gained, all tree care professionals should see an increase in both the safety and efficiency of their felling operations.

Notches

Technical felling is intended to enable users to fell trees, wood or branches in a desired direction or location with precision and control. The data gathered during the felling plan process gives arborists the information to make good decisions on where the tree can reasonably be placed, and notch selection/choice gives them the tools to make it happen. The face notch, when used correctly, is intended to dictate the direction the tree or piece of wood will take to the ground; and traditionally a face notch of a 45-degree angle approximately 1/3 of the way into the tree has been used. This angle and depth has come down to us from our logging/tree care ancestors based on their “on the job” experience and the tools



The traditional or 45-degree notch typically consists of a slanted top cut, flat bottom cut, and goes into the tree for approximately 1/3 of the tree's diameter.

All photos by Michael (House) Tain



As can be seen, the 45-degree notch will close long before the tree reaches the ground.

they had available to them. Although quite effective in some situations, it can be rather limited in the areas of control and precision. The 45-degree notch was developed and refined in the age of crosscut saws and axes, and its shape and depth reflect this. The bottom flat cut of the notch would be made first with a crosscut saw, approximately 1/3 of the way into the tree, and because crosscuts do not cut well on an angle, the upper slanted cut of the notch was completed with an axe. As those who have used them are well aware, an axe cuts most effectively at a 45-degree angle, thus the angle of the top cut of the notch. The 45-degree notch works fairly well when the lean of the tree dictates its fall and no side lean is present. But many trees grow at an angle to the ground greater than 45 degrees, thus, when the notch closes all control is lost and the tree or wood goes wherever its side lean and gravity dictate. Additionally, the moment the tree is at a 45-degree angle is also the moment of maximum “push-back” against the butt or stump, so the developers and users of this notch have learned to “step” or raise their back-cut up, creating a ledge that prevents the piece of wood or tree from kicking back off the stump. Few modern tree care professionals are using axes and crosscut saws to fell trees on a regular basis. The use of chain saws means that professionals can explore different notch angles without having the tools they use dictate their choices. The use of the open face notch, typically 70 degrees or greater, can greatly assist in precision and control in felling operations. The larger opening of this notch — determined by the angle of the tree relative to the ground and the tree care professional’s desired outcome — allows the hinge to work providing control as long as desired. It also moves the tree or piece through the point of maximum “push-back,” 45 degrees, thus eliminating the need for a stepped or raised back cut, and simplifying the cutting process. As an example, the use of a 70-degree notch on a tree straight up and down, or at a 90-degree angle to the ground, will allow it to almost be on the ground before the notch closes and the hinge breaks at approximately a twenty degree angle. Should the tree in question have some back lean, the operator might choose to open up the face notch even more to allow the hinge to work, providing control as long as possible. The open face notch is also an excellent choice for control and precision when aloft, though climbing arborists should take care to not open the notch too greatly. A notch of a great enough angle to allow the top or piece to move beyond parallel to the ground prior to the hinge breaking can cause the spar or tree to be jerked forward with the climber along for the ride.

Bore cut/plunge cut

The use of the bore cut will not only help users set up the thickness of their hinge more precisely, five to 10 percent of diameter dependent on species and wood fiber strength, but also eliminate the possibility of “barber chair,” a phenomenon in which the release of tension and compression forces within the tree or piece causes it to split vertically, often resulting in uncontrolled catastrophe. The bore cut is started with the lower quadrant of the tip of the bar — the “go” or “starting” corner. The bore cut also allows chain saw operators to set up an appropriate hinge on trees much larger in diameter than the length of the chain saw bar. Although much easier with an appropriately sized chain saw, a tree roughly three times the length of the bar in diameter can be felled by experienced bore cutters by boring through both sides and through the center of the face notch. The bores, in this application, need not match up precisely, but simply overlap within the tree or piece, as this action will sever the wood fiber sufficiently.



An open face notch, or one with 70 degrees or more of opening, will typically be shallower than a traditional notch.



As can be seen, the open face notch allows the tree to travel much further and the hinge to work much longer.



Starting the bore cut to establish the hinge.



An open face notch with hinge already established by a bore cut, strap in place, and wedges stacked.

TRAINING & EDUCATION

The bore cut, once sufficiently practiced, can not only be used on the ground or aloft in technical felling situations, but is also quite useful in bucking up logs or removing horizontal limbs to create the undercut.

Strap

The use of the bore cut to establish the hinge allows climbing arborists to leave a strap at the rear of the back cut, preventing the tree or piece from releasing. This strap should be at least 10 percent of the diameter, and larger in trees with compromised wood fiber or severe forward leans. The chain saw operator can then make sure the escape route and landing zone are clear, all needed pulling or wedging systems are in place, and do a final safety check prior to releasing the tree or piece. The strap should be severed either on level with the hinge or below, as cutting above the kerf will mean cutting into the wood that is “leaving,” and can result in the chain saw being snatched away.

Wedges/pull lines

Felling operations that require felling trees or pieces against their existing lean will require the use of pull lines or wedges to influence the natural lean. Pull lines are the most commonly used method; and, coupled with a mechanical advantage system, can be quite safe and effective in felling a tree against its natural lean. However, climbing arborists should have available, and be aware of, the use of felling wedges in influencing lean. Felling wedges differ from bucking wedges in that they have raised areas or bumps or “dogs” on them that help them stay in the kerf of the chain saw when under pressure. They come in a variety of sizes; and users should have a selection on hand suitable for different situations. Certain lean situations may call for the use of multiple wedges, in which case the technical skill of effectively stacking wedges can be quite useful. Wedges stacked upon one another in the same kerf tend to “spit” themselves out when under pressure or struck by a mallet/maul. A better option is to create “pockets” for the additional wedges beneath the kerf, approximately one to two inches apart, through the use of a bore or plunge cut. As many wedges as needed can then be stacked in these pockets. As the wedges are driven in, they will fracture the wood along the vertical plane providing the needed vertical lift.

Technical felling skills, techniques, and methods are many and varied, even among the few discussed here. All of them not only require knowledge of how and why they work, but also training and practice in how to most safely and effectively employ them. However, once technical felling becomes part of a tree care professional’s “mental toolbox,” it is always there to be drawn out, and used should the situation/scenario require it. **AA**

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