

The Important Tools in forest harvesting operation

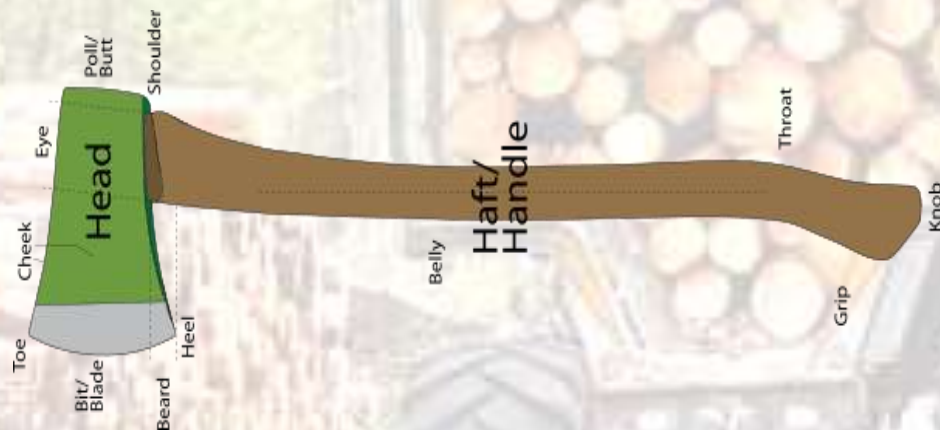
First/ Axes

Is an implement that has been used for millennia to shape, split and cut wood; to harvest timber; as a weapon; and as a ceremonial or heraldic symbol. The axe has many forms and specialized uses. Primary the axes are used for felling operation to make the undercut also is used to delimiting operation and in wood work.

Parts of the axe

The axe has two primary components: - The **axe head**, and the **haft or handle**

The axe head is typically bounded by the bit (or blade) at one end and the poll or (butt) at the other end, the top corner of the bit where the cutting edge begins is called the toe, and the bottom corner is known as the heel. Both side of the head is called the cheek and the hole where the haft is mounted is called the eye .The part of the bit that descends below the rest of the axe-head is called the beard.



The axe haft is sometimes called the handle

It was made of a resilient hardwood like hickory or hard maple, but modern axes often have hafts made of durable synthetic materials.

Often had a simple, straight haft with a circular cross-section that wedged onto the axe-head without the aid of wedges or pins.

Modern hafts are curved for better grip and to aid in the swinging motion, and are mounted securely to the head.

Types of axes head

Single-bitted axes: - have one cutting edge with a flat face, and is used to cut small trees.

Double-bitted axes: - have two symmetrically cutting edges, is used to cut large trees.



Single bitted



double bitted

The single-bitted axe is used when safety is paramount.

Some workers prefer the double-bitted axes because it is better balanced than the single bitted axe.

The shapes and types of axes

Based on the use axes have been categorized as:-

1-FELLING AXE – Cuts across the grain of wood, as in the felling of trees. In single or double bit forms and many different weights, shapes, handle types.

2- SPLITTING AXE – Used to split with the grain of the wood. Splitting axe bits are more wedges shaped. This shape causes the axe to rend the fibers of the wood apart, without having to cut through them.

3-BROAD AXES- Used with the grain of the wood in precision splitting or "hewing"

Facilitating more controlled work as the flat cheek passes across the squared timber

4-ADZE -is a tool used for smoothing or carving rough and for chipping off pieces of wood.

5- HATCHET-A hatchet is a single-handed striking tool with a sharp blade used to cut and split wood. Hatchets may also be used for hewing when making flattened surfaces on logs; when the hatchet head is optimized for this purpose it is called a broad axe.

6-HAND AXE- A small axe used for intermediate chopping, similar to hatchets.



ADZE



HATCHET



HAND AXE

Second/ Saws

A saw consists of a thin, comparatively broad blade or plate of steel, one edge of which is toothed and is provided with one or two handles attached to one or both the ends. They are used for felling, cross cutting, conversion into logs and also if needed for shaping of the wood.

Parts of saw: - Saws are made in a variety of lengths, widths, and types and with many different tooth patterns.

The principal part of a handsaw is the

- 1- Blade, or metal band, one edge of which is toothed for cutting. The flexible blade, since it must withstand many strains and yet hold its sharpness, must be made of the best quality steel.
- 2- teeth or toothline , 3- toe , 4- back , 5- heel , 6- handle



Fig.1: Saw parts

Types of saw

Saw may be of different type based on design of the cutting tooth and based on the use

A. Type based on the shape of cutting tooth:

1. Peg toothed saw: This is the most common type of saw. Teeth of the saw are similar to each other and of the form of isosceles triangles. Points and edge of the tooth cuts and loosen the wood fibers. The flanks of the teeth push the saw dust forward through the groove.



Fig 2: peg toothed saw

2. Raker toothed saw: Raker tooth saw has one raker tooth following every two or four cutting teeth. Cutters cut the wood fibers along both sides of the groove. Raker breaks off the fibers and carries them out of the saw kerfs in the form of long narrow chips. The wood noodles roll themselves in the gullets on both sides of the raker teeth and fall out of them outside the stems.

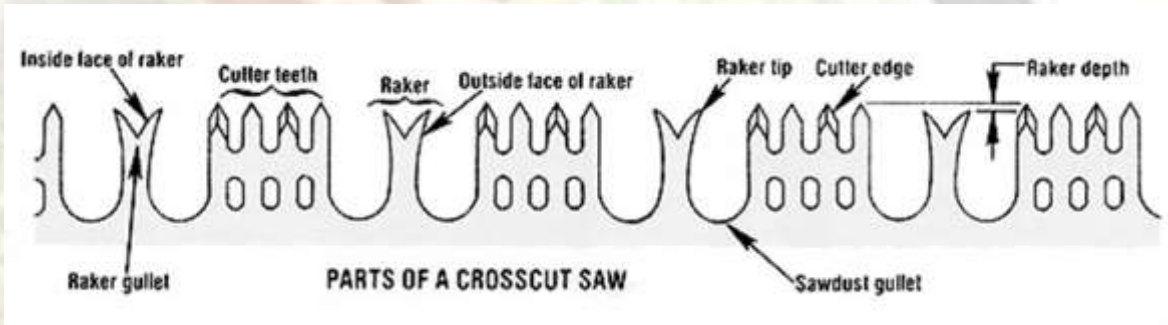


Fig 3: Raker toothed saw

B. Types based on use:

1. Cross cut Saw

- Cross cut saws are used for felling trees or conversion into logs.
- Length, breadth, thickness and shape of the tooth are the characteristics to be considered.
- Length : length of the blade most suit the movement of arms and the diameter to be cut. (140-150 cm/165-170 cm/180-200 cm for 30 cm, 30-70 cm, and 80-100 cm and over diameter)
- Breadth : narrower the blade lesser will be the friction and easier will be the wedge driving.
- Thickness : Thicker blades are stronger and easy to guide but leaves broad kerf and needs lot of energy to saw.



Fig. 4: cross cut saw

2. Bow Saw

- It is used for cutting tree branches or small poles and saplings up to 8 inches in diameter but is best for branches which are 6 inches in diameter or less. The bow saw not only cuts in a straight line, but because of the narrow blade and specialty in construction it is useful for cutting curved lines, such as around knots in the wood of trees.
- A modern bow saw resembles a small archery bow with a narrow blade in place of a bowstring.
- A bow saw is handled in a push and pull motion and usually cuts the wood as it is pushed



Fig 5: Bow saw

3. Pruning saws

- Pruning saws come in a wide variety of sizes and types and are used to prune branches that are more than one and a half inches in diameter.
- The blades of pruning saws can be curved or straight and the teeth of the blades can cut wood on the push or the pull motion of sawing depending on the saw.
- Pruning saws may be straight or curved with handle long or short



Fig. 6: pruning saw

4-Two-man cross cut saw-

A two-man saw is a saw designed for use by two sawyers. Some modern handsaws are so large that they require two persons to control, two-man crosscut saws were primarily important when human power was used. Such a saw would typically be 4 to 12 feet long (approximately 1.2 to 3.6 meters), and sometimes up to 16 feet (4.9 meters), with a handle at each end.



Fig. 7: two-man cross cut saw