

## Cross-Cut Saw News and Information

*Note – This file is an accumulation of information gathered from various sources and periodically updated.*

4/13/09

### Why are Saws Curved?

A question was recently asked me as to why does a crosscut saw have a curved blade. That's a great question. There are a number of answers and since most of you have used a carpenter saw which has a straight blade the comparison might make more sense. The first thing to understand is that the teeth on a crosscut saw work progressively. If pushing a saw the leading tooth set (meaning the combination of right cutters left cutters, raker and gullet) position the following tooth set to engage the wood efficiently. In other words the cutters score the sides of the kerf the raker scoops out the bottom and the removed wood is removed and placed into the gullet until it leaves the log and the shavings drop out.

So one of the reasons for a curved blade is that early designers found that a curved blade worked more efficiently than a straight one. Why? Well do this little exercise. Stand up and hold your hand at your waist as if holding the end of a two person saw. Move your hand first forward and then back. You will notice that your hand travels in an arc---not surprising this arc forms the basis of the arc of the teeth on the saw. The curve allows each set of teeth to engage the wood at roughly the same angle of attack regardless of where along the saw length they are engaged or where the position of the sawyers arm is. One will notice when using a carpenter saw that the saw attempts to curve up on it's own as the arm pushes it through a piece of wood.

Another reason for the curvature, or expounding the above reason, is that it allows all of the sawyers arm strength to be placed on only one set of teeth at a time. That would be the right and left cutters of the tooth set along the curvature that synchronizes the curvature of the arm arc with the curvature of the saw. By engaging only these two teeth and their raker it allows for efficiency and smoothness. It's amazing to me that these early sawyers had these principles of applied physics figured out. I have come to appreciate how when human labor is concerned the mind is indeed more powerful than brawn. Make an efficient design, make it as easy as possible to do the work and wha-la my arm won't ache as much at the end of the day. Imagine cutting across a 2x6 with a straight carpenter saw held parallel to the board surface. That would attempt to engage a lot of teeth into the fiber at one time. That is why we attack the project at an angle--- fewer teeth.

Now for those who compete in sawing competition they are not necessarily looking for easy. They are looking for speed. Hence competition saws often have an almost straight blade which engages a lot more teeth at one time. Therefore if you have the strength to pull such an aggressive saw through the log it will cut faster. The Tuatahi M-tooth saw for example does not have much curvature. It cuts very fast but put it into the middle of a 3 foot diameter log and you have a lot of teeth trying to remove wood all at once. If you have the strength to use it all day like that then it is a good tool. It's a good saw but I recommend it for smaller diameter logs since I'm getting old and weak a pulling it through the larger diameter logs we have in the west if more than I want to do. For larger diameter logs I'll stick to a curved bladed two-person saw and thank those early designers for their insight.

p.s. the curved backs of felling style saws are to make them lighter, more limber and allow the placement of wedges sooner.

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