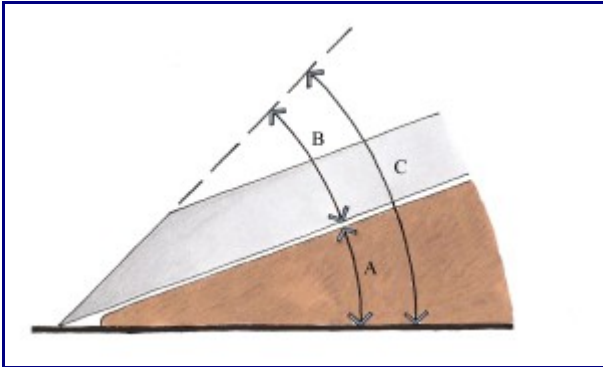


Back Bevels and Plane Geometry

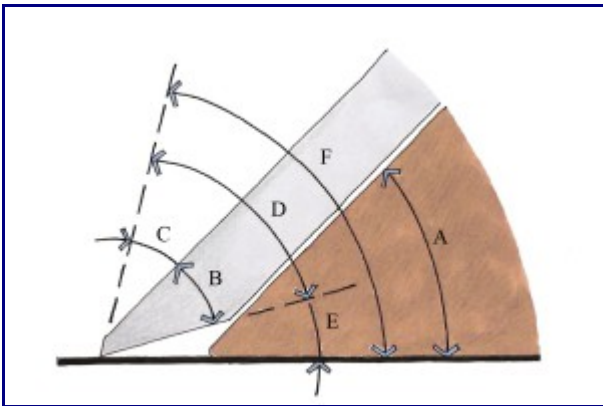
Posted on [January 4, 2010](#) by [Ron Hock](#)

Bevel-up (BU) planes have been getting a lot of buzz lately – not undeservedly; they're great planes. Part of their popularity comes from the ease with which the user can adjust the angle of attack – the angle at which the edge enters the wood – for planing various woods in different planing circumstances.



A=bed angle B=bevel angle A+B=C=angle of attack

To adjust the angle of attack, i.e. steeper for difficult grains, you simply hone a steeper microbevel on your blade. Reducing the angle will take a bit more time as the whole bevel must be re-ground to the lower angle. A small price to pay for such versatility.



A=bed B=primary bevel C=back bevel D=included edge E=relief or clearance
F=angle of attack

You can easily achieve the same goal in your standard Stanley-style bevel-down (BD) plane by *back-beveling* the blade. What's back-beveling, you ask? It's simply adding a small bevel on the otherwise flat back of your plane iron. Most BD planes bed the blade at 45° – the angle of attack. This is a good angle for most work. With difficult grain, that's prone to tearing out, however, you may benefit from a higher angle of attack, say, 55° or even higher. With higher angles of attack, the fibers are less likely to be levered up by the blade to tear out of the surface you're planing. You do have to push harder, but you can achieve a smooth surface where you may not have been able to with the lower angle. The amount

of back-bevel can be quite small; the wood only sees the first few molecules of the edge so a back-bevel as small as 1/64" should suffice. And there is no need to flatten the rest of the back – a real plus.

The only down side to the back-bevel is that, if you wish to revert to a lower angle of attack, you'll have to grind the primary bevel back past the back-bevel and start over. That's not different, if you think about it, from the blade bevel in the bevel-up planes, where you have to shorten the blade to increase the bevel angle. With a bevel-down blade, you have to shorten the blade to *decrease* the angle. My friend, [Brian Burns](#), guitar- and tool-maker, wrote a 32 page booklet about back-bevel sharpening, [Double Bevel Sharpening](#). He's condensed years of experimentation into an interesting tome complete with clear illustrations that even includes instructions for building his ideal honing system. Brian says that a blade's angle of attack should be adjusted for different woods the same way a metal-cutting tool is ground at different angles for different metals. Once you have a repeatable method for dialing in the back-bevel it only takes a few extra strokes at the sharpening station to avoid tearout in difficult woods.