

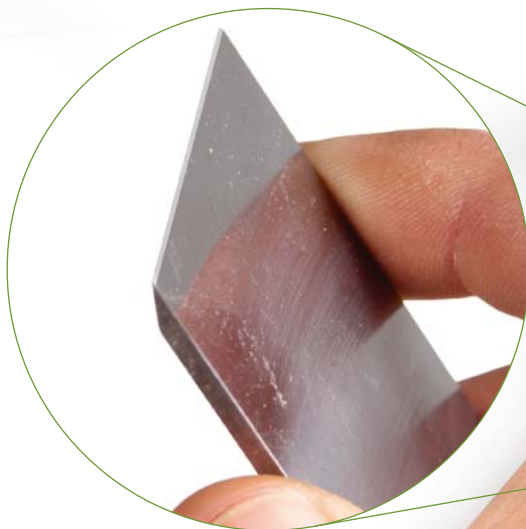
Try back-beveling your plane blade

TAME THE WILDEST WOOD
WITHOUT TEAROUT

BY CHRIS GOCHNOUR

Tough customers

Some of the most troublesome woods to plane include quartersawn white oak, crotch walnut or mahogany, hardwoods with knots or dramatic grain reversal, and tropical woods with interlocking grain. These tough woods should be attacked with a higher cutting angle—that's where a back-bevel helps.



Some time ago, on an early fall morning, I entered my workshop anxious to smooth a quartersawn white-oak tabletop using a handplane that I had meticulously tuned the previous day. It was a high-quality plane with a flat sole, a well-tuned chipbreaker, and a razor-sharp edge with the slightest camber. It was my kind of morning.

Surprisingly, though, my plane did not perform as expected. Each successive pass across the ray-flecked oak left a gaping

tear. With each pass, I was taking one step forward and two steps back.

Frustrated, I searched for solutions. I found the answer at my local library

in *Double Bevel Sharpening*, a booklet by Brian Burns (Palo Alto Publishing, 1999). As a luthier, Burns deals with highly figured and challenging grain every day, and he recommended increasing the cutting angle by adding a back-bevel to the blade. I took his advice, sharpened my blade in the new way, and my plane tamed the grain in that tabletop, leaving a glass-smooth surface.

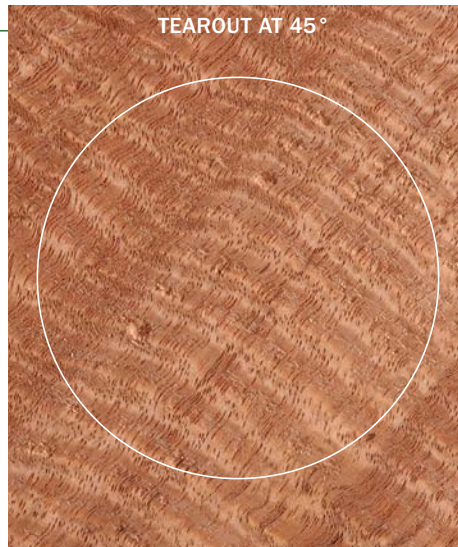
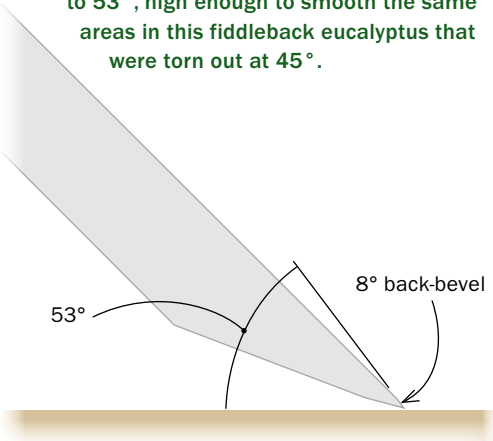
High cutting angles are the secret



The standard cutting angle of 45° can leave scars in highly figured wood, like the fiddleback eucalyptus and Mun ebony below. Increasing the cutting angle with a back bevel is a quick way to fix the problem. If the wood is still giving you fits at the highest angle, you may have to resort to sandpaper or a card scraper to bail you out.

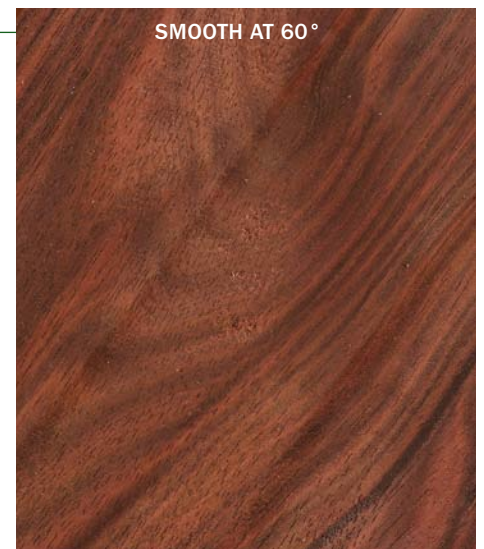
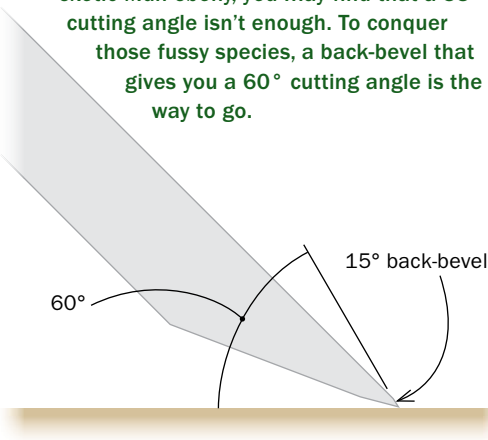
53° ANGLE SOLVES MOST PROBLEMS

An 8° back-bevel raises the cutting angle to 53°, high enough to smooth the same areas in this fiddleback eucalyptus that were torn out at 45°.



WHEN 53° ISN'T STEEP ENOUGH

For particularly ornery woods, such as this exotic Mun ebony, you may find that a 53° cutting angle isn't enough. To conquer those fussy species, a back-bevel that gives you a 60° cutting angle is the way to go.



Since then, I keep two blades on hand: one with a back-bevel and one without. I use the standard blade almost all of the time. But when I notice that I'm getting tearout in challenging grain, I replace the standard blade with the back-beveled one.

I've developed a low-tech method for back-beveling a blade. This quick, easy, and repeatable method employs a generic single-roller honing guide and a jig made from a 3/8-in. carriage bolt, a couple of washers, and a wing nut (see p. 88).

When to use which blade

In a traditional bevel-down plane, the cutting angle is determined by the angle of the frog, which is typically 45°. I

add a back-bevel of 8°, which increases the cutting angle to 53° (to learn how to increase the cutting angle of a bevel-up blade, see "Bevel up blades are even easier," p. 90). I arrived at that number by experimenting with different angles, and it works well. But you can modify this setup to suit your needs. I made a second jig that back-bevels at 60°. With both the 53° and 60° jigs, I'm ready to tackle any kind of figured wood that comes my way. In the rare event that the 60° back-bevel doesn't work, I simply use a scraper or sandpaper.

Remember, I don't use a back-beveled blade all the time. The steep cutting angle increases resistance, which requires extra effort to push the plane, and it also dulls faster, so the blade

The 75-cent back-beveling jig

Here's how to make a dirt-simple back-bevel jig using a $\frac{3}{8}$ -in. carriage bolt, a nut, a couple of washers, and a wing nut.

Loctite trick. To make sure the jig holds its angle setting, secure the lower nut using Loctite Threadlocker glue (red 271). Apply it before you set the angle (below). You have about 30 minutes.



Dial in the angle. Slide the bolt, washer, and nut all the way to the back of the blade slot. Thread the nut up or down to get the back-bevel angle, in this case 8°. Gochmour uses a digital angle gauge, but a wedge block (inset) would work, too. The plastic shim that protects the sharpening stone in use (facing page) affects the angle, so place it under the bolt. Once the angle is set, let the glue dry and then secure the jig to the blade with the other washer and the wing nut (below).



Sharpen the blade



Hone the front. Gochmour grinds the primary bevel to 25°, then sets up a 2° secondary bevel (left). He uses a honing guide and works through 800, 1,200, 4,000, and 8,000-grit waterstones (below). Don't bother removing the burr on the back of the blade; that will happen when you add the back-bevel.



needs more frequent honing. That's why I use my standard blade whenever possible.

Back-beveling is no harder than normal honing

The beauty of my method is that it doesn't require additional sharpening time. You simply hone the back-bevel at the point where you'd normally remove the burr on the blade's back.

After grinding the primary bevel on the blade, install the blade and back-bevel jig (left) in the honing guide and hone the secondary bevel using your preferred system. Once you've worked through all the grits, flip over the assembly and hone the back-bevel on your two finest stones.

Place a thin piece of plastic or plastic laminate between the carriage-bolt head and the stone to prevent abrading the bolt head, which will alter the back-bevel angle over time. The

Hone the back-bevel

Protective plastic. After sharpening, flip over the blade to create the back-bevel. Place a thin sheet of plastic on the stone to prevent damage to it and to prevent the stone from wearing away the top of the bolt, which would alter the angle over time.



Short strokes on fine stones. Create the back-bevel on your two finest stones. Use short strokes and keep the bolt head on the plastic. Five or 10 strokes, and the blade is ready for the toughest woods.



plastic also prevents the bolt head from creating a depression in the sharpening stone. Note: When you're setting the back-bevel angle, place the plastic under the bolt head so the angle doesn't change when you go to the stones.

When creating the back-bevel, use short strokes and keep the bolt head on the plastic. It is important to limit the size of the back-bevel, making it no more than $\frac{1}{64}$ in. wide. This way, if you want to eliminate it, very little material needs to be ground away on the primary bevel side.

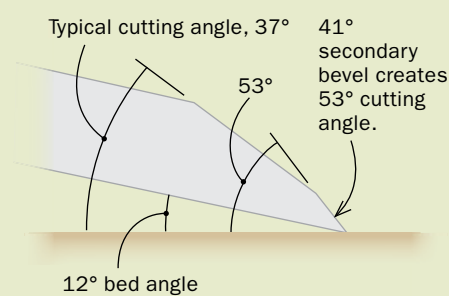
When you're finished, mark the degree of back-bevel on the blade to avoid confusion. Now you're ready to go to work. When you put the plane back together, make sure you don't set the chipbreaker beyond the back-bevel. That will create a bird's-mouth opening that will jam with shavings. □

Chris Gochnour is a hand-tool expert near Salt Lake City.



Bevel-up blades are even easier

NO BACK-BEVEL NEEDED



The cutting angle of a bevel-up plane is determined by adding the bed angle of the tool and the bevel angle of the blade. Most bevel-up planes have a bed angle of 12° and a factory-ground bevel of 25° , which produces a low cutting angle of 37° . So creating a higher angle is as easy as honing a steeper bevel on the front side—no back-bevel required. To get the 53° cutting angle, Gochnour adjusts his blade to hone the secondary bevel at 41° (left), then he sharpens the blade (below).

