

# Tip #66 How To Read Wood Grain

## A Guide To Better Planing

Aside from proper machine setup, the most important aspect of planing wood is reading the wood grain and knowing the characteristics of the wood. By misreading the wood grain, or misfeeding a board, the planer can ruin wood faster than any other tool in your shop.

It may sound a bit strange, but planing wood is a lot like petting a cat. If you stroke the fur in the wrong direction, it'll stand up and look awful. But if you stroke the fur in the direction it lays, the fur stays flat and smooth.

Like the fur on a cat, wood grain generally lays in one direction. And, as planer knives rotate, they must stroke the wood in that same direction (see Fig. 1). This is called feeding the wood with the grain.

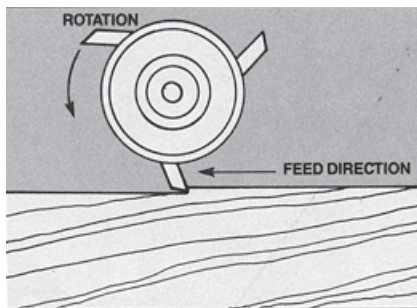


Fig. 1

If you feed a board with the grain running in the wrong direction, or feed it too fast for the grain pattern, the knives will dig under the annual rings and tear out chunks of wood. Instead of cutting a smooth surface, the planer leaves the board torn, chipped, and rougher than when you began planing. The general rule for feeding a board into the planer is simply that "the knives should stroke the wood, not ruffle its fur".

The nature of wood grain is

determined by several factors; the annual rings; how the board was cut; from what part of the tree the board was cut; and other natural phenomena such as curls, burls, and bird's eyes.

You must be able to recognize all of these qualities before you plane any board.

To determine general grain direction, look at the edge of the board perpendicular to the face you want to plane. If the grain is obscured by mill marks or rough sawing, join or hand plane the edge (see Fig. 2). Look down the edge of the board for the lines created by the annual rings. These lines will show you the general direction of the grain.

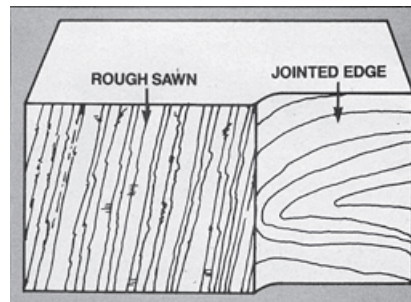


Fig. 2

You'll notice that the annual ring lines will either follow an edge or lead off toward one face or the other. Wavy grain may lead first to one face, then curve back to the other (see Fig. 3). Look for the general direction these lines take. This will determine the direction that you should feed the board into the planer.

Finding the general grain direction is just the first step. A board may also have knots, crotch figuring, burls, bird's eyes, or a

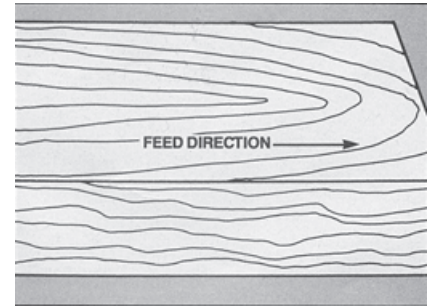


Fig. 3

curly grain pattern. Some boards may even have two or more of these characteristics, and each must be taken into consideration.

Knots are extremely hard and the grain within each knot runs at an angle to grain in the surrounding wood. This angle may be slight or it may be nearly perpendicular to the overall grain direction. To avoid tearing a knot, feed the board so the planer knives 'stroke' the grain.

Crotch figuring is the transition between the knot and the wood around it. It's not as hard as the knot, but it's harder than the surrounding straight grained wood. (The grain pattern is highly figured -- erratic and wavy -- but it follows one general direction.) Feed the wood so the knives stroke in this direction (see Fig. 4).

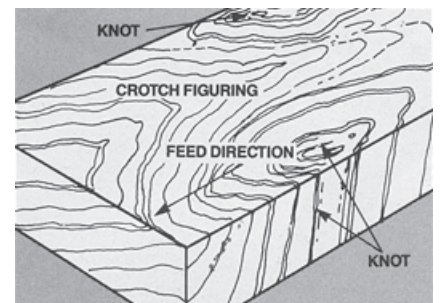
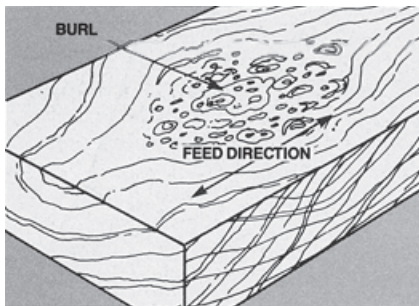


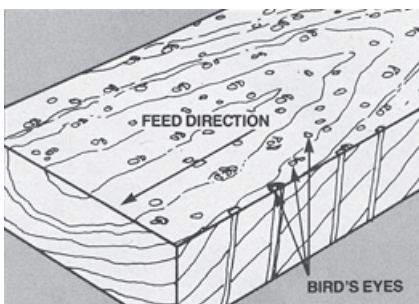
Fig. 4

Burls are hard, dense clusters of undeveloped knots surrounded by figured wood similar to crotch figuring. The grain direction is totally random. Because of this, burls are extremely difficult to plane. Take very shallow cuts at a very slow feed rate (see Fig. 5).



**Fig. 5**

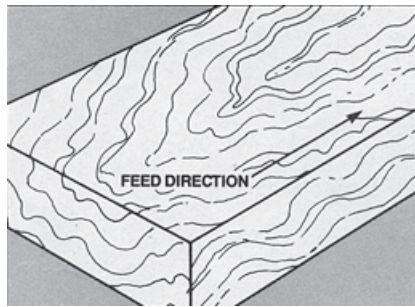
Bird's eyes are tiny knots, similar to the center of a burl, randomly distributed throughout a board. The grain of bird's eyes all tend to follow the same direction. This will determine how you feed the board into the planer (see Fig. 6).



**Fig. 6**

A curly grain pattern grows in pronounced waves that follow a general direction through the board. Because the waves are so exaggerated, the board may be difficult to plane. Feed the board in the direction indicated by the general grain direction and take very shallow cuts at a slow feed rate (see Fig. 7).

Since many types of grain may exist in a single board, the overall grain direction may be completely different at each end. If you have a board like this, "reading" the grain



**Fig. 7**

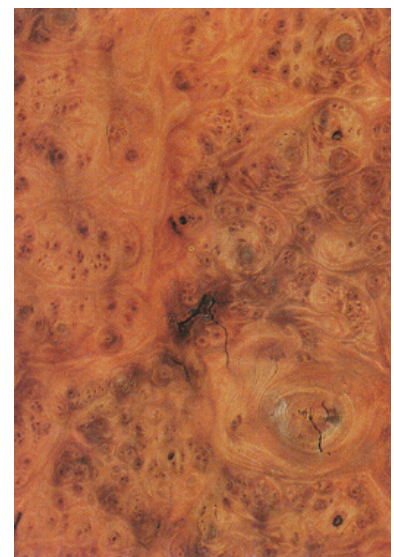
can be more art than science.

Look at the entire board and average out the effects of the different grain patterns. Do your best to determine the feed direction. Then make the first pass with a very shallow depth of cut at the slowest feed rate. If the board chips or tears, reverse the feed direction and try again. If the board still tears, check your planer knives for alignment and sharpness. Shaper knives and precise setup are absolutely essential for best results.

Once you're getting good results on one side of the board, you're ready to start planing the other side. But don't panic! The second side is always easier than the first. Just flip the board over, turn it end-for-end, and feed it through using the same planer settings.



**Mahogany, African (crotch)**



**Elm, Carpathian (burl-round)**



**Pine, White (plain sliced -- knotty)**



**Pine, Southern Yellow (plain sliced)**



**Maple (bird's eye -- half-round)**