

Green Bowls

Turn unseasoned wood, dry it, then turn again

by Alan Stirt



A big problem in bowl turning is obtaining thick, wide, dry wood. You might be able to get 4-1/2 or 5-inch thick mahogany or 4-inch teak from an importer. In the Northeast you might find some 3 or 4-inch maple, birch or cherry at local mills. These planks usually contain numerous checks and splits. If they are sound, they will be more expensive than thinner material. If you want to turn a number of bowls, such sources will be quite frustrating in terms of cost and available species.

However, green (unseasoned) wood can readily be found and is often free. Even exotic woods are much cheaper when bought in the log. Working directly from the log gives you an opportunity to fit sizes and grain patterns to your own requirements, rather than accepting material that has been milled to a predetermined size. Green planks also offer advantages over dry wood. You can get larger sizes (the sawyer won't mind cutting extra-thick planks if he knows that *he* won't have to dry them), and the material will be in better condition.

In rural areas, logging waste — often containing the most figured wood — sawmill slabs and storm-damaged trees are usually free or sold cheaply. Firewood piles yield nice chunks of local hardwoods. Small local mills usually are glad to cut logs to whatever dimensions you want. Here in northern Vermont, mills charge \$40 to \$50 per 1,000 board feet for milling logs that you bring them. If you buy a log from the mill and have it cut, the cost is 20 to 30 cents per board foot. If the log is in good condition, such material is virtually check-free. Even in cities, green wood can be had from local tree-removal services and highway departments.

After you've found a supply of green wood, you have to dry it. One way is in planks or bowl-size blocks, but this is unlikely to produce perfect material. The easiest method is to turn the wood when it's green. Once the wood is in a bowl shape it dries much faster and with fewer defects than a solid chunk. You might start with a slab of lumber 4 or 6 inches thick, but if you turn the walls of the bowl down to an inch, it dries more like 4/4 stock. The analogy isn't exact because the grain orientation of the bowl isn't the same as that of milled lumber, but proper drying procedures minimize the differences. As the bowl dries it will warp and shrink, but once it is dry the walls are thick enough to be turned true again.

As an example of green turning, I'll show how to get a dry bowl from a green log of *lignum vitae* about 9 inches in diameter. It had been drying for about two years, but it was still quite wet. Similar procedures can be used for most hardwood species, both native and exotic.

First, cut about an inch off the end of the log to find check-

free wood. If the log has been in the sun, it may be necessary to cut a series of thin slices to reach sound material. In some hardwoods small center checks run the whole length of the log, but these will be removed when trimming the block for the lathe. Next cut off a cross section as long as the diameter of the log, and rip this piece along the grain through the center of the log. If there are any center checks, make this second cut parallel to them and the saw kerf will often obliterate them. It is important to make sure the center of the tree — the pith — does not end up in your bowl as it will almost certainly split. Note any other checks and defects and plan your cuts to eliminate them from the final shape. Next, flatten the outside of each slab. This will be the bottom of the bowl. The flat surface will make the block safe to cut on the band saw. On the *lignum vitae* I roughly flattened the bottom with a 1-1/2-inch carving gouge, but these cuts can be made with a chain saw or a band saw. To cut down vibration and make turnings easier, I taper the sides of the block. I used the gouge but the easiest way is to saw a tapered circle. My band saw just doesn't have the capacity to make this cut.

The more you refine the shape with hand or power tools, the easier the initial turning will be. How far you go depends upon the size and species of your block of wood, the size and weight of your lathe, and your confidence and skill in using your tools. It's best to start with a balanced shape and discover how much unevenness you and your lathe can take. Even a small, out-of-balance piece can cause a lot of vibration.

First I turn the back of the bowl, with the face that was at the center of the log attached to the faceplate. Use long screws to grip the wet wood since the bowl will be absorbing a

Bowls turned from green wood by the author. Largest, 15 inches across, is of quilted, broad-leaf maple. Others (clockwise) are from zebrawood, white ash and cherry burl.



number of hard knocks in getting it true. Even if you don't usually wear a face shield when turning, it's important to wear one now. In the early stages chips will fly in all directions and some of them will be rather large.

Before turning on the lathe make sure the wood will not hit the ways or the tool rest. I start at a low speed and use a gouge, taking light cuts at first.

Don't try to decide the exact shape until all the rough spots are gone. Once the bowl is true, stop the lathe and carefully examine the wood. Note any defects which have to be removed, and interesting grain patterns to develop. The shape and the grain can be made to work together to create something more than just a bowl. On the *lignum vitae* bowl, I cut quite a bit off the bottom to ensure an interesting balance and pattern of heartwood and sapwood.

In shaping a bowl, I find the gouge to be the most efficient and enjoyable tool. The wood cuts cleanly and thick, curly shavings usually fly from it. *Lignum vitae* is an exception, preferring to come off as chips. Some woods, particularly butternut, are so soft and stringy when wet that they are hard to cut with anything but a gouge. A scraper just pushes the fibers around. To cut the straight foot, I use a 1/4-inch gouge with a slightly pointed nose.

When the contour of the bowl is done, flatten the bottom and make a pencil line to help reposition the faceplate.

Before remounting the bowl, I drill down to 1 inch from the bottom using a 1/2 or 1-inch bit. This gauges the depth and makes the gouge work easier. The faceplate can now be mounted on the bottom, using shorter screws because the wood will be running true. If you align two of the screws with the grain direction, the holes will probably remain in line during drying. Jot the screw size on the bowl for remounting later.

First I clean up the front, taking light cuts with the gouge. This can be a great help in reducing vibration, particularly if a chain saw was used to cut the log and the front is uneven. Now the bowl can be hollowed out. Because the wood is wet the tools stay cool and large amounts of wood can be removed before resharpening. I usually start at the center and work out toward the rim.

It's important to keep the thickness uniform throughout, so the bowl will dry evenly with less risk of checking. The thickness is very important in determining drying time, and a bowl turned down to 1/4 inch would dry very quickly with little chance of checking. However, it would distort more than a thicker bowl and when dry would be nearly impossible to turn truly round. For most native woods leave the walls and bottom about an inch thick. I gauge the thickness with calipers as the bowl nears completion, and examine it carefully for checks and knots. Checks present when the bowl is wet will get larger as it dries, and knots will often start checks that spread through the wood.

If you're satisfied with the condition of the wood, start the lathe and coat the bowl with a heavy layer of paste wax. I use Johnson's paste wax because it's cheap and I purchase it by the 12-pound case. Wax the bottom after removing the faceplate.

It's a good idea to rough-turn in an uninterrupted sequence. If you have to stop before the bowl is hollow, wax the wood to keep it from drying. I have had unwaxed pieces start checking in minutes in a heated shop.

Generally, the slower the drying the less risk of severe

warping and checking; however, if the drying is too slow the wood may succumb to fungus and decay. And the slower the bowls dry, the more storage space the turner needs.

One controlling factor is the coating on the bowl. If left unsealed, the end grain will dry much faster than the rest. This can result in checking. Wax evens the drying rate and slows the whole process. So far I have used only paste wax. I'm sure any sealer that would adhere to wet wood would work to some extent. If I find that one layer of wax is not preventing checking I'll add more. The more layers of wax, the slower the drying and, up to a point, the less the chance of checking.

Each species of wood dries differently. In general, the higher the density of the wood, the longer it will take. But even within a single species the density can vary greatly. Sapwood will generally dry faster than heartwood and can cause extra distortion in bowls where both are present. Among domestic hardwoods, cherry and apple check easily while elm, walnut and butternut are excellent; in general, fruitwoods are more susceptible to checking than nutwoods. Ash may check within minutes.

This particular variety of *lignum vitae* proved to be very stable. Although I had to be very careful about checking, hardly any distortions occurred (by using many layers of wax and slow drying conditions I lost only one bowl out of 15 completed ones). These bowls I turned from 1/2-inch to 3/4-inch thick. I dry most native wood bowls, turned 1-inch thick, for about three months. I dried the *lignum vitae* bowls from six to twelve months, according to size and thickness.

You have great control over the drying environment, and the environment is crucial. Temperature, humidity and air circulation are the important factors. In the winter I never start bowls drying in a heated room. Usually I'll dry them in a spare room which stays around 45 or 50 degrees with moderate air circulation. After some weeks — the exact time depending upon the experience with wood of this species and grain formation — I move the bowls to a heated room.

A room which has good drying conditions during a period of high humidity can become an oven when the humidity drops sharply and stays down. Often the conditions can be changed just by opening a door, for increased circulation and faster drying, or closing it, to retard drying. If you want to be more scientific, you can outfit a room with temperature and humidity controls.

Once I found some 12 by 6-inch cherry bowls had checked during their first few days in my "normal" drying conditions. I dug out the checks with a gouge and rewaxed the bowls. Then I put them in my cellar which has high humidity. The bowls gradually dried without checking. However, they developed an unattractive blue-green stain from a fungus which thrives on high humidity. I completed the drying in a heated room and then finish-turned the bowls. The stain went deep into the end grain and was visible after finishing. I later dried the cherry in conditions that represented a compromise between my spare room and the cellar.

It pays to experiment with the facilities you have available; such experimentation should be a never-ending process. I have arrested checking by placing bowls in paper bags for a few weeks to choke off air circulation. Once you have an idea of the principles involved there are endless ways to deal with problems.

To determine when the bowls are at equilibrium with the

relative humidity and temperature of the surrounding air, weigh them periodically. When they stop losing weight they are dry. Under average conditions, most native woods rough-turned to a thickness of 1 inch will dry in about three months.

I should mention an alternative to the drying procedures I use. The green bowl can be soaked in a heated solution of PEG (polyethylene glycol 1000) before drying. The chemical replaces the water in the cells and prevents them from shrinking. I experimented with PEG a few years ago and was not satisfied with the results. The slight differences in appearance and finishing qualities mentioned by PEG's proponents were real differences to me. Also, I was having success with natural drying and saw no need to continue with PEG. It can be useful, however, because with it you can turn bowls that include the pith of the tree. I know one professional turner who's satisfied with the results and I'm sure there are more. For further information, contact the Forest Products Laboratory and Crane Creek Company, both in Madison, Wisconsin.

When your bowl is dry it can be finish-turned. First, plane the bottom flat. Before mounting, drill a hole to mark the finished depth. This will prevent turning through to the screws, which penetrate about $3/16$ inch. I usually am able to use the same screw holes as in the rough turning, and I use the same length screw. Mount the bowl on the lathe and check to see that it clears the rest and the bed.

I true the outside first, with the lathe at low speed. I usually use a gouge but I found light cuts with a small round-nose scraper ideal for the lignum vitae, which is very hard when dry. A larger tool might have taken too big a bite and forced the bowl off the screws. I finished off the outside shape with a skew scraper.

At this point I usually sand the outside of the bowl. I turn most bowls relatively thin and when I am done hollowing, the walls vibrate. It's much easier to sand before hollowing, with little vibration. I start with 50 or 80 grit and work my way up to 220. I always wear a mask because the fine dust can be quite harmful.

Now I clean up the rim of the bowl with a gouge. Next I get the inside rim true and work my way down to the bottom, using a gouge and scraper. I advise against using the scraper on the sides of deep bowls because it can really make a mess of end grain. When I'm satisfied with the contours and thickness — measuring with calipers — I sand the inside of the bowl using the same grit sequence as on the outside. The bowl can now be hand-sanded, if desired, to remove circular scratches. Finish as you like.

The above procedures are only guidelines and can be adapted for almost any wood you'd care to turn. Exact methods of turning and drying should be worked out individually in one's own particular situation. I've had some failures and will have more in the future, but I've had a high rate of success. It is very satisfying to make a bowl when you control the whole process from log to finished form.

Before turning the back of a bowl cut from a green log (top photo), try to make it as round as possible. With the back turned, the faceplate is then attached to the foot, and the bowl is rough-turned. Then the whole bowl is liberally coated with paste wax (bottom photo) to control drying. When dry, the bowl is remounted and finish-turned.

