

The Heretic's Guide to Alternative Lutherie Woods, by John Calkin.

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Why do we even need alternative wood species for musical instruments? That's a perfectly valid question, and the answer is that we don't. Rosewood, mahogany and maple have served us well for centuries, we know what to expect of them, and our customers have already come to accept them as trustworthy and will pay for them. So why look further?

First of all (and speaking from a steel string guitar perspective), let's discard the notion that some species of wood make good instruments and that others don't. The concept of tonewood is a hoax. Of the few things that we can do to a guitar and still call it a guitar, changing the wood it is made of will have the least impact upon the quality of the sound that it produces. The tonal difference between a mahogany guitar and a rosewood guitar is exactly the same as the difference between two mahogany guitars or two rosewood guitars. Can you tell what a guitar is made of while listening to an unfamiliar recording? No one I know claims they can. No one at the blind listening sessions I've attended could reliably distinguish between mahogany and rosewood guitars, or maple and koa guitars for that matter.

Guitars sound like guitars. No matter how poorly or bizarrely they are made, you'll never confuse the natural sound of an acoustic guitar with that of a banjo, a mandolin, a drum or a flute. Obviously, not all guitars sound alike, but even when we think we can distinguish a night-and-day difference, it won't be so extreme that one will sound like a guitar and another won't. We may have a strong preference for one or another, but they will all sound like guitars. If they didn't, they would be called something else.

The tone of a guitar lies more in the hands of the builder than in the materials from which it is constructed. With increased experience, the level of craftsmanship increases. As the quality of the luthier's instruments goes up, the tonal difference between the instruments goes down. There are not only fewer dogs, but it becomes more difficult to build one that stands noticeably above the others. I noted this phenomenon in my mountain dulcimers years ago, and more recently have seen it happen to my guitars.

Psychoacoustics plays such a large role in this matter that it's difficult to discuss tone objectively. (I think that it's called psychoacoustics because trying to figure out stringed instruments will make you psycho.) We hear what we expect to hear, what we have been taught to hear, what we want to hear, and often what we hope to hear. Many luthiers and musicians alike spend hundreds of hours and thousands of dollars collecting information and recordings and they have come to have a stake in the sanctity of its rightness. They need the vast body of instrument mythology to be correct, and strongly oppose the possibility that it may be bogus. This makes it extremely difficult for a daring luthier to sell instruments that aren't made of standard varieties of wood.

So if the type of wood doesn't matter to the instrument, and if we can't get good money for instruments made of alternative wood, why bother with them?

I like them because I need a certain amount of variety in my life. Curiosity has often been a stronger task master than the buck, I guess. I've tried as many types of alternative woods as anyone I know, which is what led to my conclusions about tonewood. I also want my personal instruments to be as unique as possible, regardless of how others may judge them, and alternative wood is an easy way to produce a singular appearance.

Alternative species will eventually become more acceptable as standard species go the way of Brazilian rosewood.

Alternative wood can also be cheaper and more accessible than standard tonewood. This can especially be an important factor to beginning luthiers. If your favorite wood should become accepted by the industry, you'll notice an astonishing price increase as it is stocked by tonewood suppliers. Instrument-grade wood is the cream of the crop and should demand a premium, but lumberyard stock can be just as satisfying to work with, and without breaking your bank account.

Perhaps I should briefly describe my experiences with conventional wood species, just so you have a gauge for my opinions about the alternatives.

Mahogany is a lovely wood to work with. Old-timers maintain that the quality of mahogany isn't what it used to be, and I am forced to believe them. Supplies today vary widely in hardness and density. Some mahogany is stiffer and heavier than other samples. Some mahogany guitar sets seem almost fluffy and floppy by comparison. Most mahogany is plain, yet pleasing to look at. Sets demonstrating a ribbon figure are prettier, but tend to ripple across the grain during bending, though the rippling can almost always be sanded out without compromising the guitar. Straight-grained mahogany can be predictably bent into a tight cutaway without breaking. Tool marks and sanding scratches are easily removed. Mahogany is a dream wood.

Indian rosewood is much harder, heavier, and stronger than mahogany. Guitar sets seldom show much figure, but we're all accustomed to looking at it that Indian rosewood just looks "right". Sanding this wood clean takes more effort than mahogany, but a good random orbital sander relieves most of the grief. Indian rosewood is extremely compliant. I once accidentally bent a side into a tight cutaway, having forgotten to plug in the heat blanket. It was quite surprised when I removed the wood from the Fox bender and it sprang back halfway to straight. No other wood of my experience would have survived such a trial. If it weren't for the allergy I am developing toward rosewood, I would have nothing bad to say about it.

The most trying wood that I have used to any extent is Brazilian rosewood. The stuff loves to warp while it is sitting on the shelf, and, once installed in a bender, is capable of almost anything. Brazilian can be so squirrely that an occasional side may have to be discarded, since trying to sand out the ripples would leave the wood paper thin. We might

expect this from the dregs of Brazilian that are left today, but I bought wood thirty years ago that was just as bad. Once made into a guitar, Brazilian rosewood frequently checks and cracks for no apparent reason. If it wasn't for the incredible premium that the wood demands, I don't believe anyone would use it today. The stuff is grossly overestimated.

The makers of other instruments are probably glad that not many flattop guitars are made of maple, which leaves the supply of good stuff for them. Maple sort of proves my point about tonewood. Quilted maple is soft and floppy. Bird's-eye maple is very hard and stiff. Flame maple can cover the whole gamut. Yet guitarists believe that all maple sounds the same, which goes against the rules they have set up for rosewood and mahogany. Go figure. Figured maple can put up a fight when bent and might ripple badly across the grain. It's also very abrasion-resistant, which makes it difficult to sand out scratches. Blond guitars can be hard to sell if they aren't shaped like a Gibson jumbo. Pretty maple can often be found at the lumberyard, which makes it a bargain guitar wood if you have the means to resaw it.

Before you start daydreaming about having all the cheap wood you want, remember that some tonewood companies will join backs and sand sets to usable thickness for you (for a fee, of course), thus saving you the cost of a large bandsaw and a thickness sander. All the tasty lumberyard alternatives you may process won't actually be so cheap until you've paid off this equipment.

Some species are easier to deal with than others. For luthiers, this is primarily a matter of bending the sides. Hand bending is the cheapest way to go, and learning the process with mahogany will make the process the most bearable. Some say they like to "communicate with the wood" this way, but I never felt the wood had anything to tell me. The acquisition of a heat blanket and the creation of some simple forms will go a long way in removing the stresses of bending both to the wood and the luthier. A thermostat for the blanket and a set of spring steel slats to support the wood are worthwhile accessories. If Venetian cutaways are on your to-do list, you'll want to add a Fox Bender to your equipment list.

Instruments can be designed to make bending easier. Dreadnaughts are the easiest to bend. Tight waists make life more difficult for the hand bender, but not for the blanket-equipped. Tight cutaways always present some risk, especially if the wood has prominent cross-grain figure. More on this later.

So, on to the alternatives. This list isn't meant to be comprehensive, it's just a collection of species I have made into instruments and my impressions of them. The fact that many of the illustrations feature Huss and Dalton isn't meant to be an advertisement; H&D is simply where I've gained most of my experience with a few kinds of wood. Besides, I've come to think of them as my guitars. The bosses will understand. Some of the photos are of sanded but unfinished work, which seldom shows the wood to the best advantage. Sorry 'bout that.

Ash. Ash is considered by many to be the premier firewood, and not of much further use. Steam-benders who make snowshoes or lacrosse sticks know better. Luthiers primarily use ash for electric guitar bodies, but the same bending qualities that the other trades admire make this wood wonderful for instrument sets. Ash is harder and stiffer than mahogany, sort of an open-grain maple. The pore structure is similar to oak; the pores are numerous and deep. It's about the color of cream when freshly cut, aging rapidly to light tan. Ash stains well and a contrasting pore filler added interest. Ash is pretty boring unless you are fond of Fender electrics, which mostly exhibit a sunburst or pickled finish when used with this wood. A rare sample of ash might have the most astonishing combination of swirls, curls, and flame. Finding quartered ash is just a matter of luck. More on unquartered wood later. The illustration shows unfinished ash used as a top wood. It's been my experience that hardwoods thinned to the same flexibility as a plate of softwood produce similar tone qualities, though very hard species will be dangerously thin by the time this point is reached.

Australian Blackwood. Koa hasn't been included in this list, as I consider it a standard wood. However, Aussie blackwood is a kissing cousin to koa. In fact, I have come to prefer it. Both are acacias. Blackwood (which isn't black at all), is usually cheaper than koa. It can be as pretty as all but the most spectacular koa, though koa might demonstrate a wider palette in the same board. Blackwood is harvested in this country, but I'm told that the really pretty stuff comes from Australia. Once finished, blackwood is nearly indistinguishable from koa, but the grain structure is finer, the pores smaller, and the wood is less likely to chip and tear out when machined. Some mutilation when routing binding channels is still a problem, however, it's just that koa is worse. Curly blackwood may be a bit less nasty to bend than curly koa, also. Both like to break right on a curl. Experience suggests that flatsawn sides have more integrity than quartered sides, and are more likely to survive being bent into a tight cutaway. The Fox Bender will easily tame both varieties when no cutaway is desired. However, it often happens that the guitarists most likely to enjoy fancy wood also admire cutaway shapes. Dammit! The curly forms of both acacias used to break regularly, even in non-cutaways when bent using the stainless steel slats usually supplied with the Fox Bender. Light-gauge spring-steel slats made all the difference, though the wood must be shielded from the spring steel by aluminum foil to prevent a nasty blue-black stain. Prominent curls may produce facets in the bent sides, but they always seem to dress out safely. Both acacias may become dangerously brittle if too much heat is used in bending or if the wood is cooled too rapidly. If a dry side doesn't quite fit into the mold, try wetting it lightly; rub in the moisture, then slowly squeeze it into the mold with clamps. I've had good luck with this technique.

Birch. Early in my career, I used a lot of birch. It was the cheapest hardwood available at the local lumber yard. It works, acts, and looks much like maple, though curly birch normally has a much larger curl than curly maple. You've probably seen it made into hollow doors where the large figure can be appreciated. Early in the century, Gibson carved a lot of mandolins out of birch, and most of the people who own them today think they are maple. I recently played a Garrison guitar, the body of which was completely made of birch glued to some sort of synthetic framework. It was a low-end guitar, but it

sounded fine. I haven't made a birch instrument in a long time, but I have a soft spot for the wood. It's normally considered a poor relation to maple, but don't be afraid of it if you find an appealing piece. It probably won't be quartersawn. Don't worry about it; it will be strong and pretty stable.

Black limba. I've read that korina and limba are from the same tree, that korina is the thick sapwood and black limba is the heartwood. Of course, korina is the wood that went into the '50's Flying V's and Explorers made by Gibson, and there are folks today who consider it the premier wood for solidbody electrics. The black limba I've worked with is a bit harder than the korina in the instrument I've altered, but not by much.

Black limba is about the same as mahogany in weight, hardness and texture. The background color is a light gray. Fine streaks of brown and black make it far more appealing than plain mahogany. The boards I acquired had plenty of fine worm holes, but were pretty enough that I decided to fill the holes and not worry about them. (Sharpen a big sliver of the background wood in a pencil sharpener. Put glue on the point, shove it tightly into the worm hole, then snip it off with dikes. The fill will show, but few will guess that there was a hole there.) The pores are small enough that I've finished the wood without filling it. My wood is unquartered, but demonstrated no warping during bending. I like this stuff, and wouldn't hesitate to substitute it for mahogany. While touring the Warmouth plant, I was surprised to see a stack of black limba bodies in a production run. It's possible this African wood may gain a toehold in popularity. It deserves it.

Bubinga. This is a wonderful wood in every respect. It is as hard as the rosewoods, but has a finer texture with no pores to fill. It bends easily and holds its' shape. The brownish-purple color is close enough to rosewood to look familiar. To top it off, bubinga is cheap even from tonewood suppliers. The only hitch is that you can't sell a bubinga guitar. Call it African rosewood, its' inaccurate nickname, and you'll have no problem. Flatsawn bubinga shows a stunning bee's-wing pattern. Quartered wood is plainer, but still pretty. I like this wood a ton. It deserves more recognition.

Butternut. Also called white walnut, butternut is softer and less likely to be figured than black walnut. It's not really white, but a creamy light brown. Flatsawn stock shows prominent lines from the growth rings. I've never come across a quartersawn board of butternut, nor a piece large enough to make into a full-size guitar, much to my regret. The trees do grow large enough, however. The wood bends nicely, but go easy on the water as it is more absorbent than walnut or mahogany. It's a fuzzy wood, easy to sand, but the fuzz won't stay down. A long series of whiskerings will deal with it, but I normally sand to 220 grit, shoot a sealer coat which raises the grain and locks it, then sand with 320 to remove the whiskers. I've only gloss-finished butternut with CrystaLac and found pore filling unnecessary. A lacquer job might go faster if filler was used. On my low-end travel guitars, I shoot a coat of lacquer, sand with 320, then shoot two more coats, polish quickly by hand to make the surface silky, and call it quits. It's an attractive look, but I would never do it on an expensive instrument.

Cherry. In working properties, cherry strikes me as a reddish version of plain maple with a tangy smell thrown in. Seldom found as quartersawn lumber, it nevertheless makes into fine, if rather plain, instruments.

It's useful to examine one's expectations for alternative species. For me, cherry and birch were locally available and cheap. I used them to learn to process lumber into instrument wood and crafted them into a wide array of instruments while I learned the trade, then I left them behind. To say I outgrew them would indicate that I consider them unworthy, which is not the case. I did, however, use up my interest in them. As skill levels rise, they might as well be applied to wood that is held in higher esteem by potential customers. Commercial value should not be confused with functional value, but it must be considered if you want to sell instruments. Cherry is everything a luthier could wish for, but walnut is easier to process, hardly more expensive within the scheme of things, and is easier to sell. A really choice piece of cherry could reverse this opinion.

Honduras Rosewood. This wood is the exception that proves the rule that the wood species contributes very little to the tone of an instrument. Honduras rosewood is extremely hard and brittle. Guitars made from it have a cold, glassy sound lacking in depth, but they are very loud. As the saying goes, give them loud and they'll hear tone.

Here's my current take on tonewood. Guitars are intensely inefficient sound machines. According to Steve Klein's lecture at the '01 GAL convention, only 4% of a plucked string's energy is turned into sound. We're lucky we can hear the damned things at all! The fact that an extreme wood like Honduras rosewood can change the tone of a guitar leads me to believe that guitar design simply doesn't allow such a subtle thing as wood choice to make a difference in its tone until an extreme is reached. If and when guitars become more efficient, we may find that various woods will offer guitarists a wider tone palette. That's pure conjecture, take it or leave it.

This rosewood needs a bit more heat to make it bend comfortably, and, at H&D, we machine it at least 10% thinner than Indian rosewood just to keep the weight down. As with Brazilian rosewood, even coddled guitars may develop cracks in the wood. These cracks don't open, but they are certainly visible and fall under warranty repair. We expect a portion of the Honduras rosewood to come back, and Mark Dalton has become an expert in making invisible superglue mends. This wood is not for the fainthearted luthier or musician.

Imbuva. Also called Brazilian walnut, imbuva is very similar to walnut in working properties. The most astonishing thing about this wood is the spicy smell it releases when it is machined. Pleasant at first, the smell may eventually drive you right out of the shop. Imbuva is often attractively figured, but not spectacularly so, and its base color is more like cinnamon than the brown of walnut. Its pores are small and do not feed filling. It bends willingly. Taylor has adopted imbuva, which may open the market for the rest of us.

Meranti. Jeff Huss found a small supply of this Filipino mahogany at a bluegrass jam and has been searching for more ever since. Its' fiddleback figure looks wonderful. There is little to say about it since it is a mahogany. We ran out of meranti before I began building the bodies at H&D. I remember Mark breaking a fair number of sides trying to bend them into cutaways, but this was before we switched to spring steel slats in the bender.

Myrtle. This is yet another wood that reminds me of maple in appearance and working properties, though its' texture is a bit coarser. Its basic straw color is often flavored with an amazing array of colors and figure, most frequently a maple-ish fiddleback. Myrtle has a reputation for instability that I have yet to experience. Tonewood suppliers occasionally stock sets of myrtle, but if you can resaw, the specialty lumber people like Lewis Judy can give you a better deal on this West Coast wood. This is first-class stuff, worthy of the best instruments.

Oak. Oak is coarse and its large pores are hard to fill, but its availability in home improvement stores makes it widely available. Quartered oak is common at lumberyards. The only thing wrong with oak instruments is that they look so much like furniture. Quartered stock displays an irregular pattern of medullary rays that add interest to the ring lines, though filling the pores with dark material draws the eye away from the rays. Oak loves to bend and is seldom cantankerous in this regard. The hardness of the wood varies across the same board, so machine sanding alone will leave the surface wavy. The trick is to machine sand and then block sand with each grit. White oak seems to have a slightly finer texture than red oak, otherwise, I don't distinguish between the two. This wood is so far outside of musicians' expectations that oak instruments always take them by surprise, especially if they hear them before seeing them. In areas where oak is commonly burned for heat, it may be held in low regard for any other use. Be brave, though. Oak is fun to work with.

Paduak. My most recent personal guitar is a paduak OM. My favorite dulcimer also had a body completely made of paduak, even the top, and I regret the day I finally sold it. My paduak mandolin is long gone, too. Red seems like a poor choice for an instrument wood, but I've had good luck with it. Contrary to some slanderers, paduak seems to stay red if lacquered soon after sanding, though an oil finish will quickly turn to a dingy brown. This African wood is as hard and heavy as rosewood, but more brittle than Indian when thinned to instrument dimensions. Like a few other tropical timbers, it may sport insignificant-looking cross-grain fractures that may snap during bending, so examine boards carefully before purchasing or splurge on prepared guitar sets. The pores in the wood are so large and deep that filling them twice is a good idea. Paduak dust smells sweet, but will give you a surprising case of red snot. All in all, this is not a good wood for beginners.

Sapele. This African wood is in the mahogany family and as such as acceptable to guitarists. Clear stock is more brittle than Central American mahogany and often darker in color, and the price is about the same. Flatsawn sapele often displays a wild quilted figure, and this stuff is altogether not for the timid. Surfaces may be half end grain and half long grain, which makes bending and sanding a trial. Even when successfully bent,

the sides may have a distinctly faceted appearance that must be dressed out, and the grain may have such a strong zigzag to it that the sides zip side-to-side when rolled on a belt sander. The quilt pattern may eventually telegraph itself through the lacquer, causing the owner some distress. Due to the flatsawing and the massive amounts of end grain, fancy sapele has almost no tap tone (tap tones are a farce, too. Don't get me started!) Why use it then? Because it is gorgeous and commands a handsome upcharge. If this floppy African cardboard makes into a fine guitar--and it does-- then any wood will.

Shedua. I've only made one guitar from this wood, and I only include it because it was such an ordeal that I thought you should be warned. The board was too pretty to resist, a cinnamon-brown with modest flame figure and darker streaks of color. Resawing it gave no hint of how hard it would be to bend. The sides were like rubber. This was during my hot pipe days, and the only solution I could find was to get an entire side as wet and warm as possible and then jam it into the mold with a bunch of clamps. It made a pretty 00-ish guitar, but I've never been back. Let me know if you've tried this wood in a Fox Bender.

Sycamore. A sycamore 34" across the butt fell over outside my New Jersey shop. I had it milled up, and for a while I had sycamore lumber up the wazoo, with enough quartered stock for a boatload of instruments. Quartered sycamore displays a prominent lace pattern of pink on cream, or, most commonly, light brown on cream. The wood is soft enough that a tree can be ripped up for resawing with a chain saw, a task that would be unbearable with oak or walnut. The wood has no pores, but somehow encourages a rough finish, more like spruce than a hardwood. It feels and handles like the softest varieties of mahogany and makes into a very light guitar. Don't confuse American sycamore with English sycamore, which is a true maple. Quartered American sycamore is cherished as a cabinetwood in Europe, where it is called plane lacewood, but it gets no respect for anything in America. Sycamore splits readily, and the infested wood makes wild looking instruments. If this soft and floppy American cardboard makes into a fine guitar--and it does--any wood will.

Walnut. Walnut is exactly the right color for a guitar. My opinion, of course. Even the plain stuff is pretty, and figured walnut is my favorite wood. It machines wonderfully, bends like a dream (except the unpredictable fiddleback samples), is easy to finish and makes a nice, light guitar. Claro walnut from the West Coast states seems to be more reliably figured than the more common black walnut, though they work much the same. I once helped take down an English walnut tree and was given half the trunk. The texture was finer and the pores smaller than American walnut, and the color was that of creamed coffee. I wish that I had a truckload of it. Walnut even smells like perfume to me. I like it.

White pine. No, I'm not kidding. I've played with pine because it's cheap and always around. I've never attempted a pine guitar, but I'd like to some day. Bob Benedetto made his fabled knotty pine arctop that sounds just like his other guitars. This is the best evidence I can offer that the sound of an instrument is in the hands of the maker, not in the wood. The only photo I have of my own work in pine is Little Blue, my camping dulcimer. Blue is 100% white pine sprayed a transparent blue. He's dusty, worn, and

covered in insect repellent spots, but he keeps on truckin'. He's also twelve years old and counting, and sound as the day he was glued together.

Zebrawood. The smell of zebrawood used to nauseate me, but through experience, I've come to enjoy it. Most of the lumber is well quartered in order to bring out the best figure and color, dark brown stripes on a straw background. Too regular a striping can be pretty boring. Zebrawood is another tropical species that may unexpectedly break when bent due to unnoticed cross-grain fractures. It is heavy, hard, and yet brittle. The pores are huge, deep and will swallow huge amounts of filler. I know a music store owner who bought a zebra bass body, finished it in oil, then quickly assembled the piece and hung it in his shop. The wood soon checked in dozens of places. Disgusted, he gave me the body to cut into fancy pickup rings and control knobs I was making at the time. I filled the checks with superglue, sanded back to clean wood, lacquered the body, and sold it back to him. It remained stable. I don't know what the moral is, but I like the story.

Ziricote. This wood is sometimes called Mexican ebony, though it's not really black and it's not an ebony. The pretty pieces are a dark gray with black streaks, and the really pretty pieces will knock your socks off. Ziricote has become my favorite fingerboard wood when no fancy inlays are anticipated. It recalls ebony, but is pretty, and the figure is not obscured by time or finger grunge. It's very expensive when purchased as tonewood sets. The lumber I've used has all been too narrow for two-piece guitar backs, leading me to believe that large ziricote trees are uncommon. The wood is strong, hard, and oily, a combination guaranteed to eat the paper off your thickness sander. It eats bandsaw blades, too. Use extra heat to bend the sides and you should be OK. This wood has given me no problem with cracking once made into instruments, but I suspect that on a full-size guitar it may present a hazard. Treat it like Brazilian or Honduras rosewood. It's precious stuff.

So, that's my life in the alternative wood fast lane. I hope that you find it useful and not too frightening. All this wood has taught me a lot. I don't believe that unquartered wood is a handicap. I don't think the species of wood contributes to the tone of a guitar. I don't concern myself with with tap tones or tap tuning. I believe that good work and experience is everything. None of this will sway a mind that is already drenched in traditional guitar mythology, but so be it. Most of those folks never made an instrument.

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About the author:

John Calkin is a contributing editor to *American Lutherie*, the official publication of the Guild of American Luthiers (GAL). A professional luthier since 1980, he has made over 300 instruments. He began working for Huss & Dalton in 1995 building guitar bodies, and, has made 1400 bodies as of 03/05. More on John may be found at his website [JcalkinGuitars.com](http://JcalkinGuitars.com); he may be reached via e-mail at [jcalkin@velocity.net](mailto:jcalkin@velocity.net). For more information on the Guild of American Luthiers, visit their website at <http://www.luth.org>