

Harvesting and Working

Green Wood

By George Freeman

Four ways to obtain green wood for turning:

Cut down a tree.



Four ways to obtain green wood for turning:

Find trees already
cut down by
other people.



Four ways to obtain green wood for turning:

Have a friend give you green wood they have obtained.



Four ways to obtain green wood for turning:

Hang around someone with a sawmill .



Things to consider about trees



- 100 foot tall pine tree.
- 38 inch diameter trunk
- 2000 board feet of lumber.
- 20,000 pounds of wet wood.

Doyle volume chart

Results in board feet of lumber

Log length		Diameter of log, small end, inside bark (inches) * Results are in board feet per tree (bf)																	
		6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
6	feet	2	6	14	24	38	54	74	96	122	150	165	198	234	273	315	360	408	459
8	feet	2	8	18	32	50	72	98	128	162	200	221	265	313	365	421	481	545	613
10	feet	3	10	23	40	63	90	123	160	203	250	276	331	391	456	526	601	681	766
12	feet	3	12	27	48	75	108	147	192	243	300	331	397	469	547	631	721	817	919
14	feet	4	14	32	56	88	126	172	224	284	350	386	463	547	638	736	841	953	1,072
16	feet	4	16	36	64	100	144	196	256	324	400	441	529	625	729	841	961	1,089	1,225
18	feet	5	18	41	72	113	162	221	288	365	450	496	595	703	820	946	1,081	1,225	1,378
20	feet	5	20	45	80	125	180	245	320	405	500	551	661	781	911	1,051	1,201	1,361	1,531
22	feet	6	22	50	88	138	198	270	352	446	550	606	727	859	1,002	1,156	1,321	1,497	1,684
24	feet	6	24	54	96	150	216	294	384	486	600	662	794	938	1,094	1,262	1,442	1,634	1,838
26	feet	7	26	59	104	163	234	319	416	527	650	717	860	1,016	1,185	1,367	1,562	1,770	1,991
28	feet	7	28	63	112	175	252	343	448	567	700	772	926	1,094	1,276	1,472	1,682	1,906	2,144
30	feet	8	30	68	120	188	270	368	480	608	750	827	992	1,172	1,367	1,577	1,802	2,042	2,297
32	feet	8	32	72	128	200	288	392	512	648	800	882	1,058	1,250	1,458	1,682	1,922	2,178	2,450
34	feet	9	34	77	136	213	306	417	544	689	850	937	1,124	1,328	1,549	1,787	2,042	2,314	2,603
36	feet	9	36	81	144	225	324	441	576	729	900	992	1,190	1,406	1,640	1,892	2,162	2,450	2,756
38	feet	10	38	86	152	238	342	466	608	770	950	1,047	1,256	1,484	1,731	1,997	2,282	2,586	2,909
40	feet	10	40	90	160	250	360	490	640	810	1,000	1,103	1,323	1,563	1,823	2,103	2,403	2,723	3,063
42	feet	11	42	95	168	263	378	515	672	851	1,050	1,158	1,389	1,641	1,914	2,208	2,523	2,859	3,216
44	feet	11	44	99	176	275	396	539	704	891	1,100	1,213	1,455	1,719	2,005	2,313	2,643	2,995	3,369
46	feet	12	46	104	184	288	414	564	736	932	1,150	1,268	1,521	1,797	2,096	2,418	2,763	3,131	3,522
48	feet	12	48	108	192	300	432	588	768	972	1,200	1,323	1,587	1,875	2,187	2,523	2,883	3,267	3,675
50	feet	13	50	113	200	313	450	613	800	1,013	1,250	1,378	1,653	1,953	2,278	2,628	3,003	3,403	3,828

20 ft. tree/ 24 inch diameter at small end = **500** board feet of lumber

Weight Chart based on Doyle Chart

Doyle Log Weight - Hardwoods

Table in pounds (lbs.) per log

Log length		Diameter of log, small end, inside bark (inches)																	
		6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
6	feet	160	200	260	340	420	560	700	840	1,040	1,260	1,380	1,500	1,620	1,740	1,860	1,980	2,100	2,220
8	feet	200	260	340	460	600	780	980	1,200	1,460	1,760	1,920	2,080	2,240	2,400	2,560	2,720	2,880	3,040
10	feet	280	320	440	580	780	1,000	1,260	1,560	1,880	2,260	2,460	2,660	2,860	3,060	3,260	3,460	3,660	3,860
12	feet	320	360	520	720	960	1,220	1,540	1,900	2,320	2,760	3,000	3,240	3,480	3,720	3,960	4,200	4,440	4,680
14	feet	360	420	600	840	1,120	1,460	1,820	2,260	2,740	3,260	3,540	3,820	4,100	4,380	4,660	4,940	5,220	5,500
16	feet	420	480	700	960	1,300	1,680	2,120	2,600	3,160	3,760	4,060	4,360	4,660	4,960	5,260	5,560	5,860	6,160
18	feet	480	540	800	1,080	1,480	1,900	2,420	2,940	3,580	4,260	4,560	4,860	5,160	5,460	5,760	6,060	6,360	6,660
20	feet	540	600	900	1,200	1,660	2,120	2,720	3,280	4,000	4,760	5,060	5,360	5,660	5,960	6,260	6,560	6,860	7,160
22	feet	600	660	1,000	1,320	1,840	2,340	3,020	3,620	4,420	5,260	5,560	5,860	6,160	6,460	6,760	7,060	7,360	7,660
24	feet	660	720	1,100	1,440	2,020	2,560	3,320	3,960	4,840	5,760	6,060	6,360	6,660	6,960	7,260	7,560	7,860	8,160
26	feet	720	780	1,200	1,560	2,200	2,780	3,620	4,300	5,260	6,260	6,560	6,860	7,160	7,460	7,760	8,060	8,360	8,660
28	feet	780	840	1,300	1,680	2,380	3,000	3,920	4,640	5,680	6,760	7,060	7,360	7,660	7,960	8,260	8,560	8,860	9,160
30	feet	840	900	1,400	1,800	2,560	3,220	4,220	4,980	6,100	7,260	7,560	7,860	8,160	8,460	8,760	9,060	9,360	9,660
32	feet	900	960	1,500	1,920	2,740	3,440	4,520	5,320	6,520	7,760	8,060	8,360	8,660	8,960	9,260	9,560	9,860	10,160
34	feet	960	1,020	1,600	2,040	2,920	3,660	4,820	5,660	6,940	8,260	8,560	8,860	9,160	9,460	9,760	10,060	10,360	10,660
36	feet	1,020	1,080	1,700	2,160	3,100	3,880	5,120	6,000	7,360	8,760	9,060	9,360	9,660	9,960	10,260	10,560	10,860	11,160
38	feet	1,080	1,140	1,800	2,280	3,280	4,100	5,420	6,340	7,780	9,260	9,560	9,860	10,160	10,460	10,760	11,060	11,360	11,660
40	feet	1,140	1,200	1,900	2,400	3,460	4,320	5,720	6,680	8,200	9,760	10,060	10,360	10,660	10,960	11,260	11,560	11,860	12,160
42	feet	1,200	1,260	2,000	2,520	3,640	4,540	6,020	7,020	8,620	10,260	10,560	10,860	11,160	11,460	11,760	12,060	12,360	12,660
44	feet	1,260	1,320	2,100	2,640	3,820	4,760	6,320	7,360	9,040	10,760	11,060	11,360	11,660	11,960	12,260	12,560	12,860	13,160
46	feet	1,320	1,380	2,200	2,760	4,000	4,980	6,620	7,700	9,460	11,260	11,560	11,860	12,160	12,460	12,760	13,060	13,360	13,660
48	feet	1,380	1,440	2,300	2,880	4,180	5,200	6,920	8,040	9,880	11,760	12,060	12,360	12,660	12,960	13,260	13,560	13,860	14,160
50	feet	1,440	1,500	2,400	3,000	4,360	5,420	7,220	8,380	10,300	12,260	12,560	12,860	13,160	13,460	13,760	14,060	14,360	14,660

20 ft. tree/ 24 inch diameter at small end = **4,760** lb. of wood

Weight of Wood

Wood Species	Fresh Green Wood	Air dried Seasoned Wood	Percentage of loss
	Density (lb/cf	Density (lb/cf	%
Mesquite	45	43	4%
Cedar, Eastern Red	37	33	11%
Osage orange	64	57	11%
Beech, American	54	45	17%
Cherry, black	45	35	22%
Honey locust	58	45	22%
Pine, Southern Yellow	53	41	23%
Ash, Green	53	40	25%
Oak, white	63	47	25%
Mulberry	59	44	25%
Maple, silver	45	33	27%
Hickory	62	45	27%
Pecan	62	45	27%
Hackberry	51	37	27%
Maple, Sugar	59	42	29%
Post oak	64	45	30%
Oak, Red	61	42	31%
Walnut, black	58	38	34%
Elm, American	54	35	35%
Cypress, Southern	51	32	37%
Redwood, American	50	28	44%
Sycamore	63	34	46%

Transporting turning wood



Transporting turning wood



Transporting turning wood



Felling a tree safely – **the tools**

- Wedges
- Plum bobs
- Felling sticks
- Chainsaws



Felling a tree safely

- Find the center line of the tree in the direction you want it to fall (green line)
- Draw a triangle 80% of the width of the tree (yellow line)



Draw a line horizontal around the rest of the tree staying one to two inches **above** the bottom of the front triangle (purple line)



Cut out the front relief wedge



Start cutting from the back of the tree.



Apply wedges to back of the tree as soon as you have enough room. This keeps the tree from setting back on your saw. This also begins the tilting of the tree in the direction you want it to go.



Stop the chain saw leaving two inches of wood at the front hinge. Double your wedges and beginning tilting the tree forward as you drive them in.



Timber! Done right



Dangers of a rotten core.



Mistakes people make cutting trees:

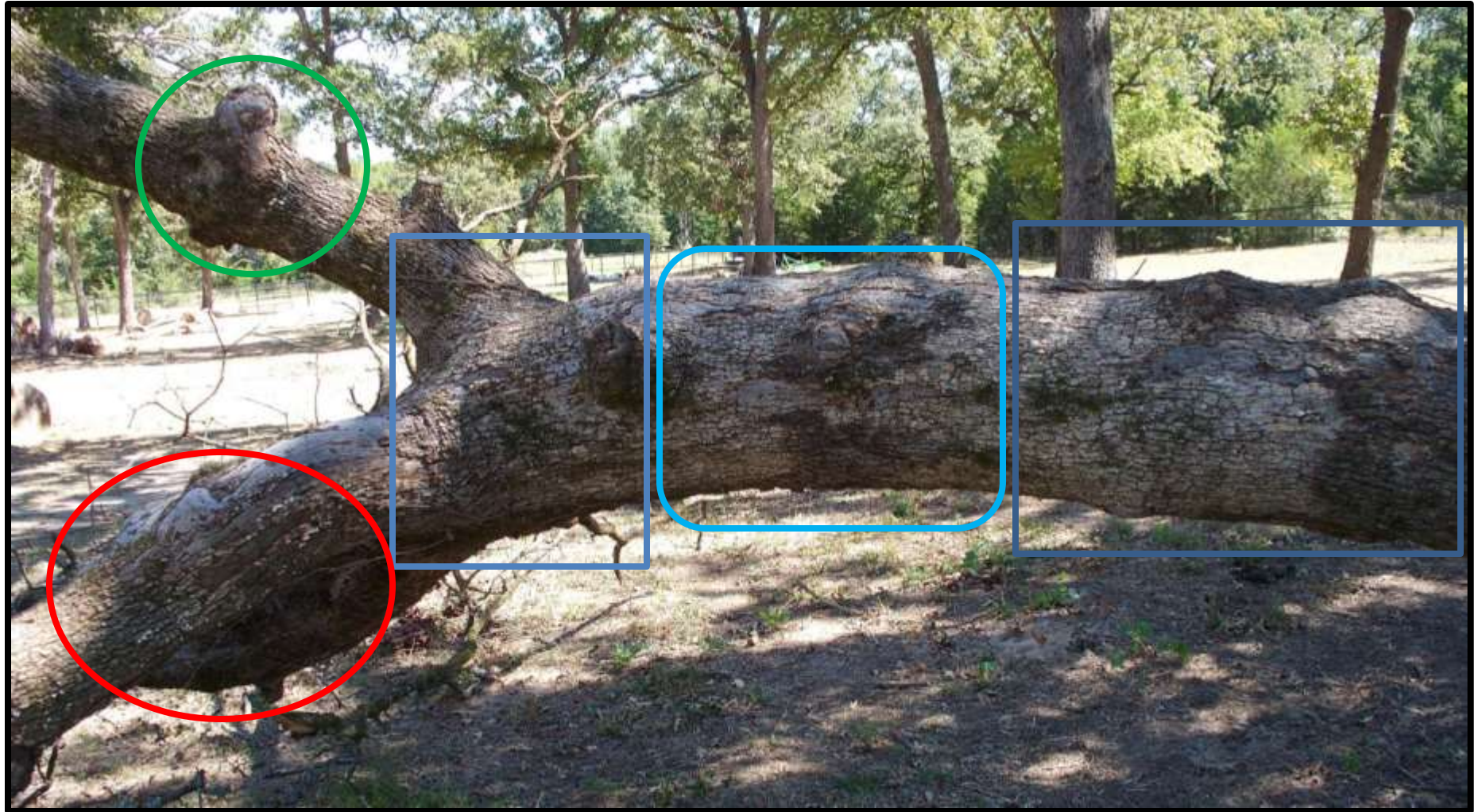
Cutting the relief cut to deep

Not leaving enough hinge thickness

Who's cleaning up the mess of the unwanted wood?



Where do you take your turning blanks
from ???



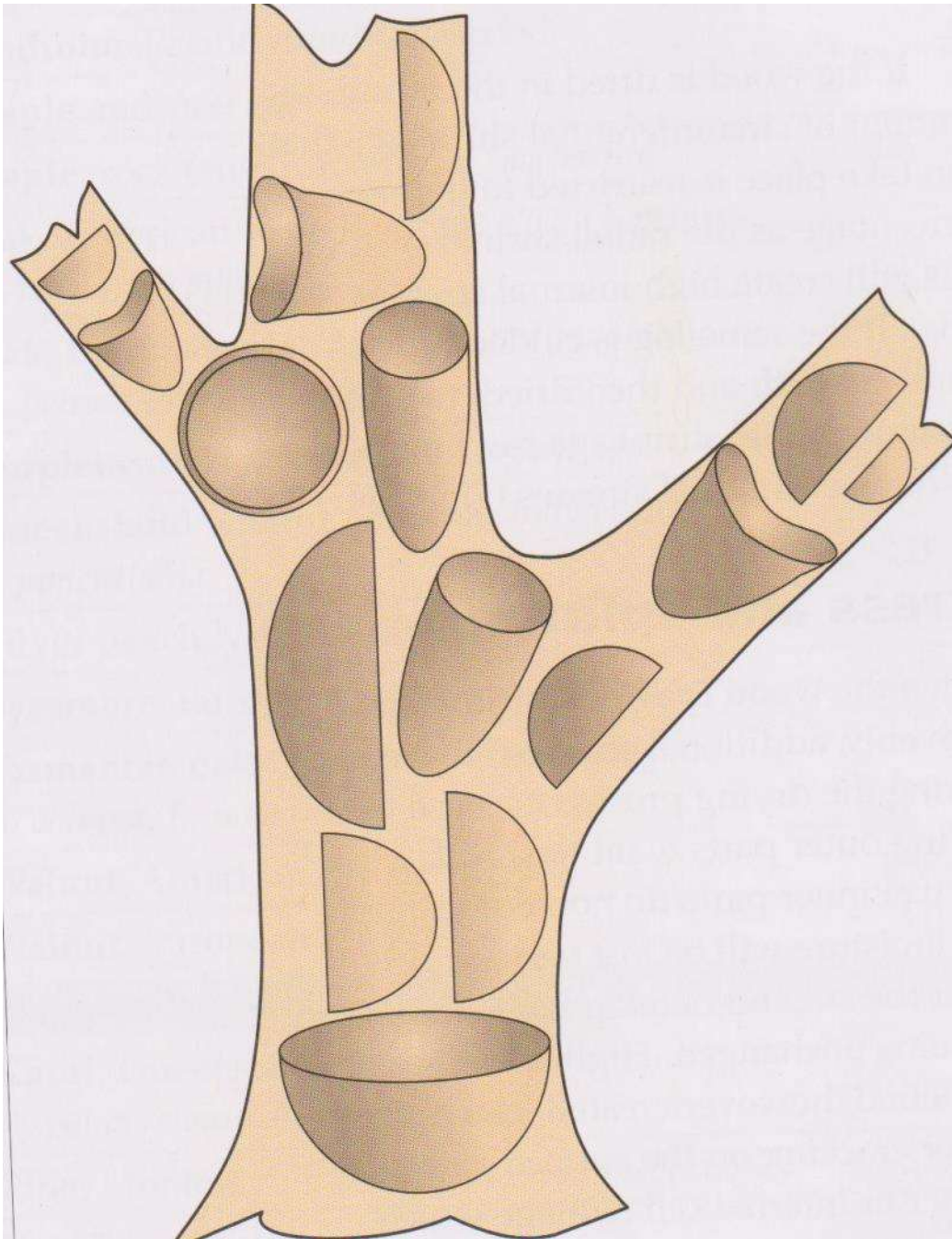




How **BIG** a piece of wood should you harvest for your turning blanks ???



**Rotten limb
extending into the
core of the tree.**



First Question:

What type of turning blank do you want from this tree ???

Second Question:

What portion of the tree should you harvest your turning blank from ???

Processing the wood for storage and turning



200 lbs. of Pecan wood

Crotch Figure

PECAN







Processing the wood for storage and turning



Processing wood for turning and storage



The proceeding slides dealt with processing green wood for bowl blanks.

How would you process turning blanks for making a round vase ???

Preparing wood blanks for turning



Preparing wood blanks for turning

Saving the best Spalted wood



Spalted Pecan

Preparing wood blanks for a circle turning jig

Find the center

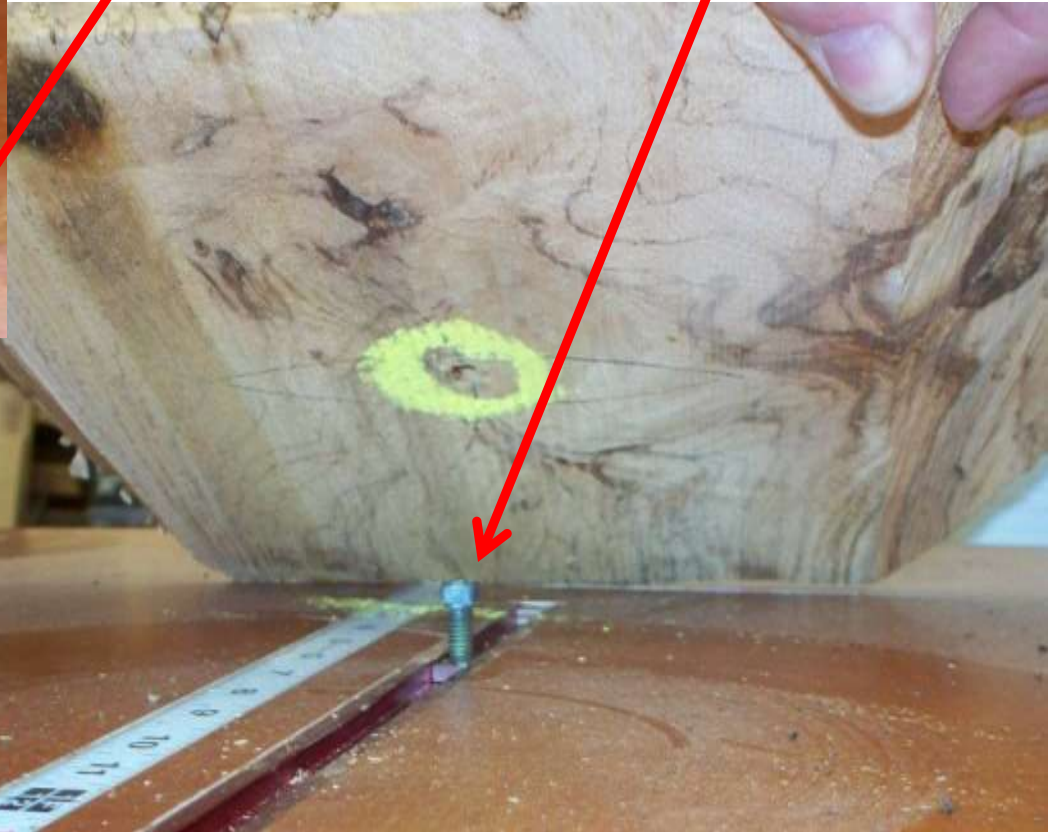


**Drill a 3/8" hole
1" deep**



Preparing wood blanks for a circle turning jig

1/4" Cap screw with a 3/8" head
3/8" Screw chuck



Preparing wood blanks for turning



Spalting green wood in a Fungi Farm to enhance its beauty



Spalting green wood in a Fungi Farm to enhance its beauty



Spalting is the beginning stages of fungi attack that will result in rotting of the wood given enough time.

Pecan



Sycamore



The spalting process needs three things, the decay spores, moisture, and heat. In fresh cut wood, the spores and water are already there. In Texas you have high heat.

Rough turned,
green, wet Beech
platter coated with
Anchor Seal wax
will enhance
Spalting.



Spalting green wood in a Fungi Farm to enhance its beauty

Woods that Spalt easily and beautifully

Pecan

Hickory

Sweetgum

Maple

Cherry

Bradford Pear

Beech

Pine

Other light colored woods

Woods that are hard to Spalt or it doesn't show up in the wood.

Sycamore

Black Walnut

Mesquite

Bois d'Arc

Red Cedar

Shrinkage and Distortion of green wood

Removal of moisture from the felled tree to levels below the fiber saturation point (about 32% water) causes the wood to shrink.



Shrinkage and Distortion of green wood

The water/paper towel example.

The beech wood example.

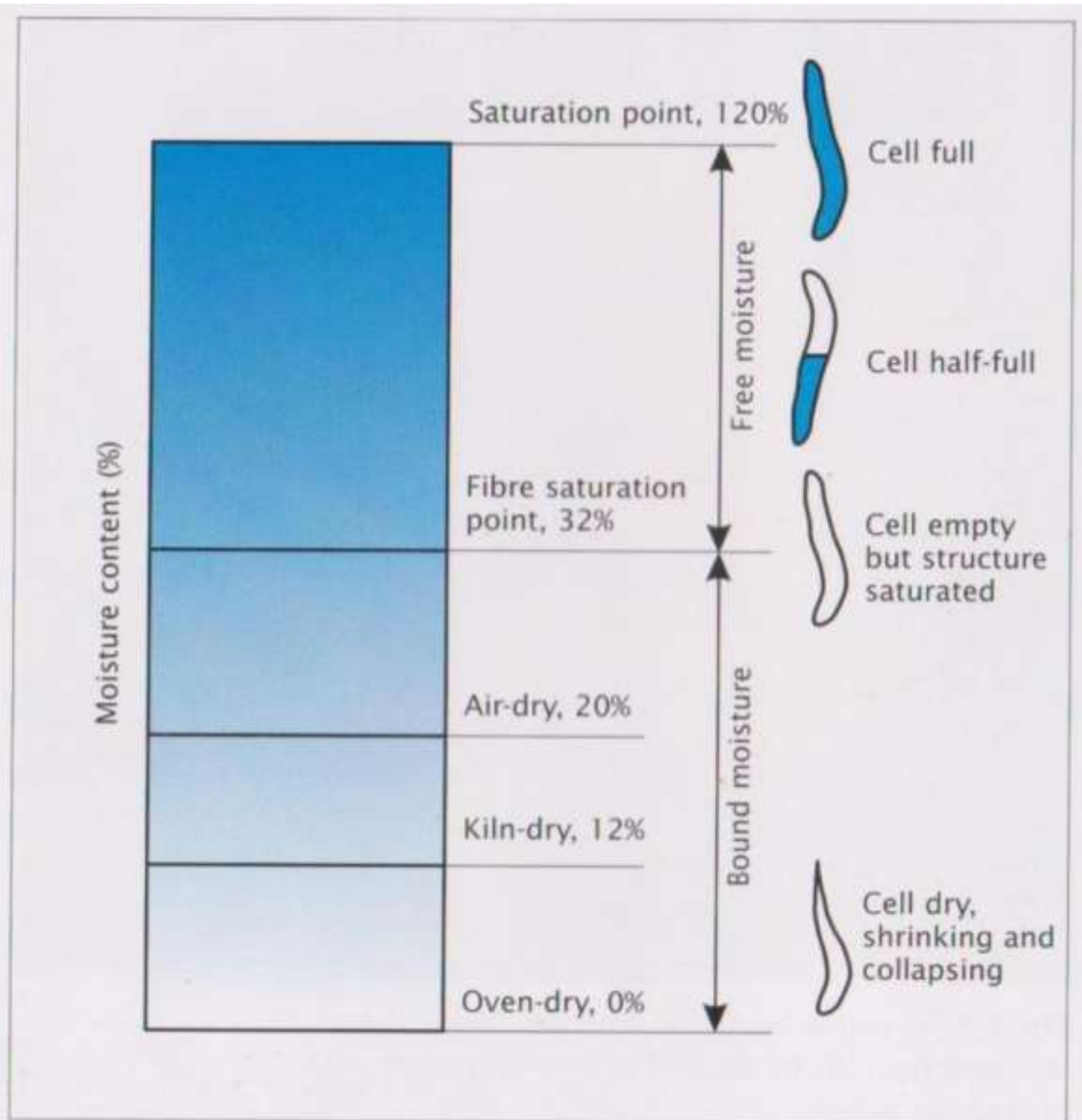


Fig 1.4 How moisture is held in the tree. The figures given are average ones, and do not represent a particular wood

Shrinkage and Distortion of green wood

Use a moisture meter to determine the percent of moisture left in green wood.



Shrinkage and Distortion of green wood



Shrinkage and Distortion of green wood

Different woods shrink
at different rates

Eastern Red Cedar
“*Juniperus Virginiana*”



Hickory

Shrinkage and Distortion of green wood

Sweet Gum



Bois d'' Arc

Osage Orange

Horse Apple Tree



Shrinkage and Distortion of green wood

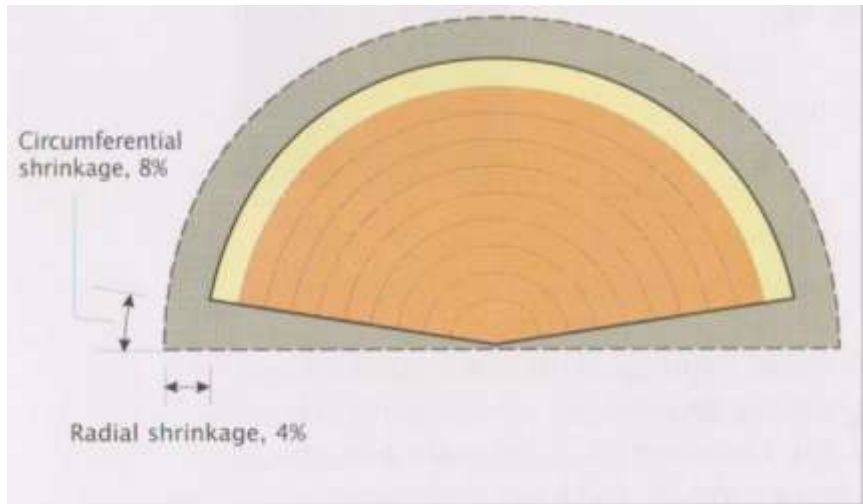
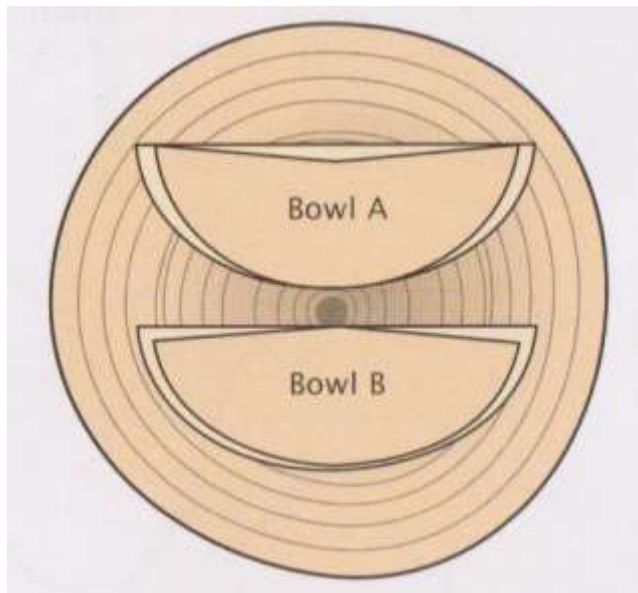


Fig 1.7 Shrinkage and distortion in a halved log



**Average shrinkages,
fibre saturation point (FSP)(32%)
to 12% moisture content.**

	Radial	Circumferential	Ratio
Hardwoods	%	%	
Ash	4.5	7.0	1.6
Cherry	3.5	6.5	1.9
Elm	4.5	6.5	1.4
Holly	5.0	12.0	2.4
Sugar Maple	2.5	5.0	2.0
White Oak	3.0	5.5	1.9
Purple Heart	2.0	4.5	2.3
Beech	3.0	6.0	2.0
Sycamore	2.5	5.5	2.2
Walnut	2.5	3.5	1.4
Softwoods			
Pine	2.5	4.0	1.6

Shrinkage and Distortion of green wood

**Circumferential shrinkage
on persimmon wood**



**Shrinkage of
crooked grain
Walnut root**

Shrinkage and Distortion of green wood

1. Walnut Root



2. Black Cherry off-cut



3. Beech slab 2" thick



4. Walnut turning blank 2" x 20"



Shrinkage and Distortion of green wood

Have a saw mill cut your wood into two, three or four inch slabs so it will **dry faster**. Slabs make great shallow bowls and platters.



Shrinkage and Distortion of green wood

One of the ways to deal with shrinkage and distortion of your bowl is to rough turn it and leave the walls **thick** until its dry. Wall thickness should be left 1 to 1 ½" inches



Shrinkage and Distortion of green wood

Bradford Pear – Which way will it warp and distort during drying?



Controlling Shrinkage and Distortion

You can control the rate of moisture release by applying coatings to slow down drying of the wood.

Walnut Root with Latex Paint



Cherry with Anchor Seal



Black Walnut with Paraffin Wax



Controlling Shrinkage and Distortion

Applying anchor seal to slow drying and distortion of wood.



Controlling Shrinkage and Distortion

A bowl that was allowed to dry to much on the outside, causing stress cracks to open up. Anchor Seal was applied.

As the moisture equalizes through out the bowl the cracks are closing up and the anchor seal is being squeezed out of the cracks.



Controlling Shrinkage and Distortion

You can remove the water from the wood fibers by immersing in a alcohol bath for 48 hrs. This will help control shrinkage.



Mixed results from this.

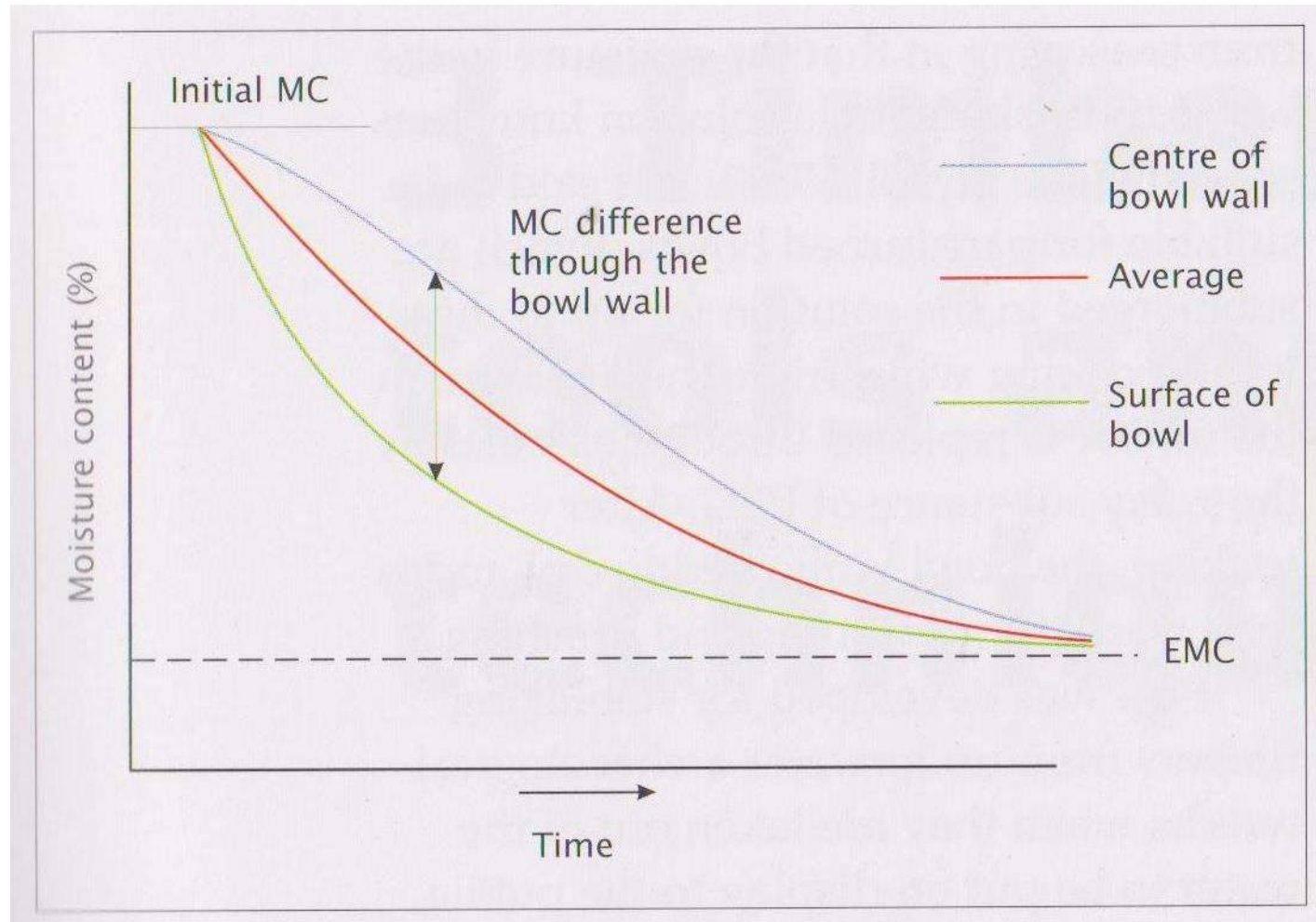
Controlling Shrinkage and Distortion

Microwave drying can speed up drying of a bowl. Must be done slowly and at low heat with repeated cycles.



Controlling Shrinkage and Distortion

How uncontrolled drying leads to differential drying in different parts of the bowl

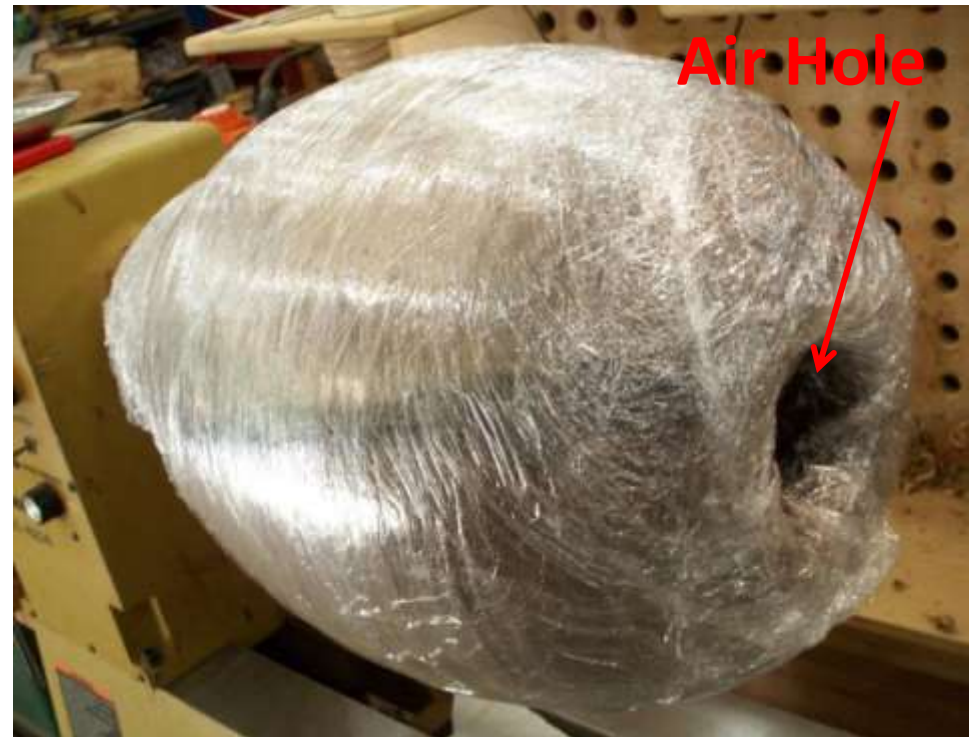


Controlling Shrinkage and Distortion



Wrapping the outside of a bowl or vase slows down the outside drying while allowing the inside to dry faster. This reduces cracking.

Black Walnut Vase



Controlling Shrinkage and Distortion

Plastic bag used to slow down drying on the bottom of the bowl while allowing the top side to dry quicker.



Controlling Shrinkage and Distortion

- Other methods of relieving stress in wood as it is drying.
 - Steaming wood in a steam chamber will help relieve stress and speed drying.
 - Boiling in water relieves stress and speeds drying.

Dealing with holes, knots, cracks & crooked grain woods

Our repair arsenal



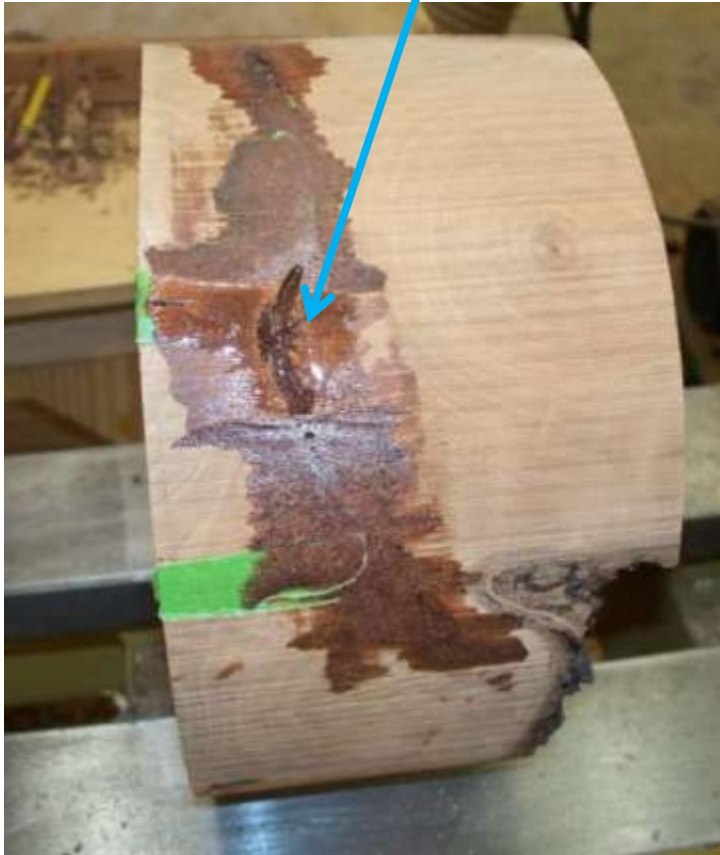
Dealing with holes, knots, cracks & crooked grain woods

Making wood crack filler using natural wood. Mix with clear epoxy and fill your holes and cracks so they match.



Dealing with holes, knots, cracks & crooked grain woods

Holes



Filler



Dealing with holes, knots, cracks & crooked grain woods

Epoxying structural weakness cracks for safety before and during turning.



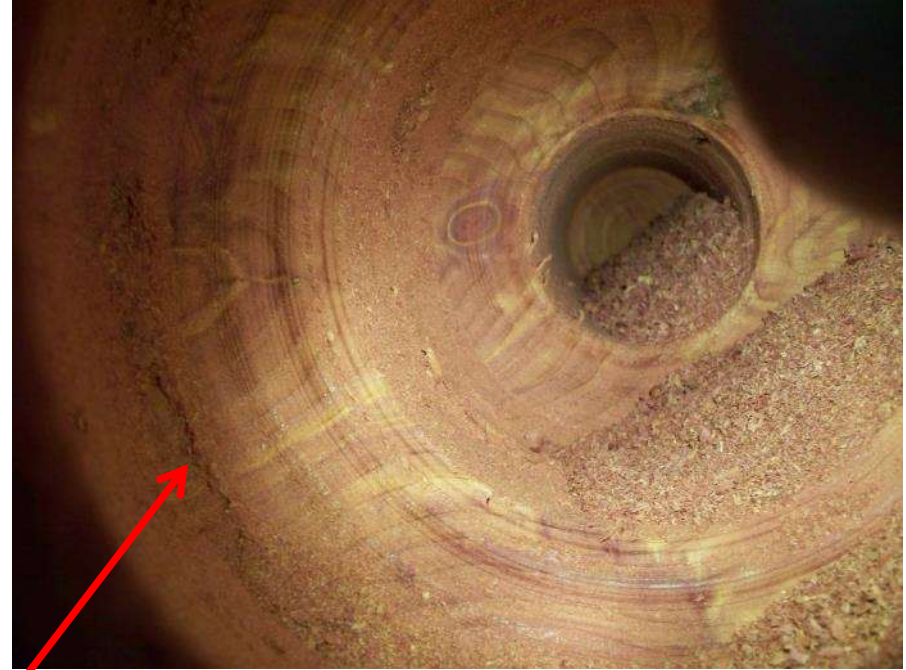
Dealing with holes, knots, cracks & crooked grain woods

The Red Cedar Vase



Dealing with holes, knots, cracks & crooked grain woods

Filling the cracks with epoxy



Cracks – inside and out

Dealing with holes, knots, cracks & crooked grain woods

The Red Cedar Vase



Dealing with
holes, knots,
cracks & crooked
grain woods





Dealing with crooked grain woods

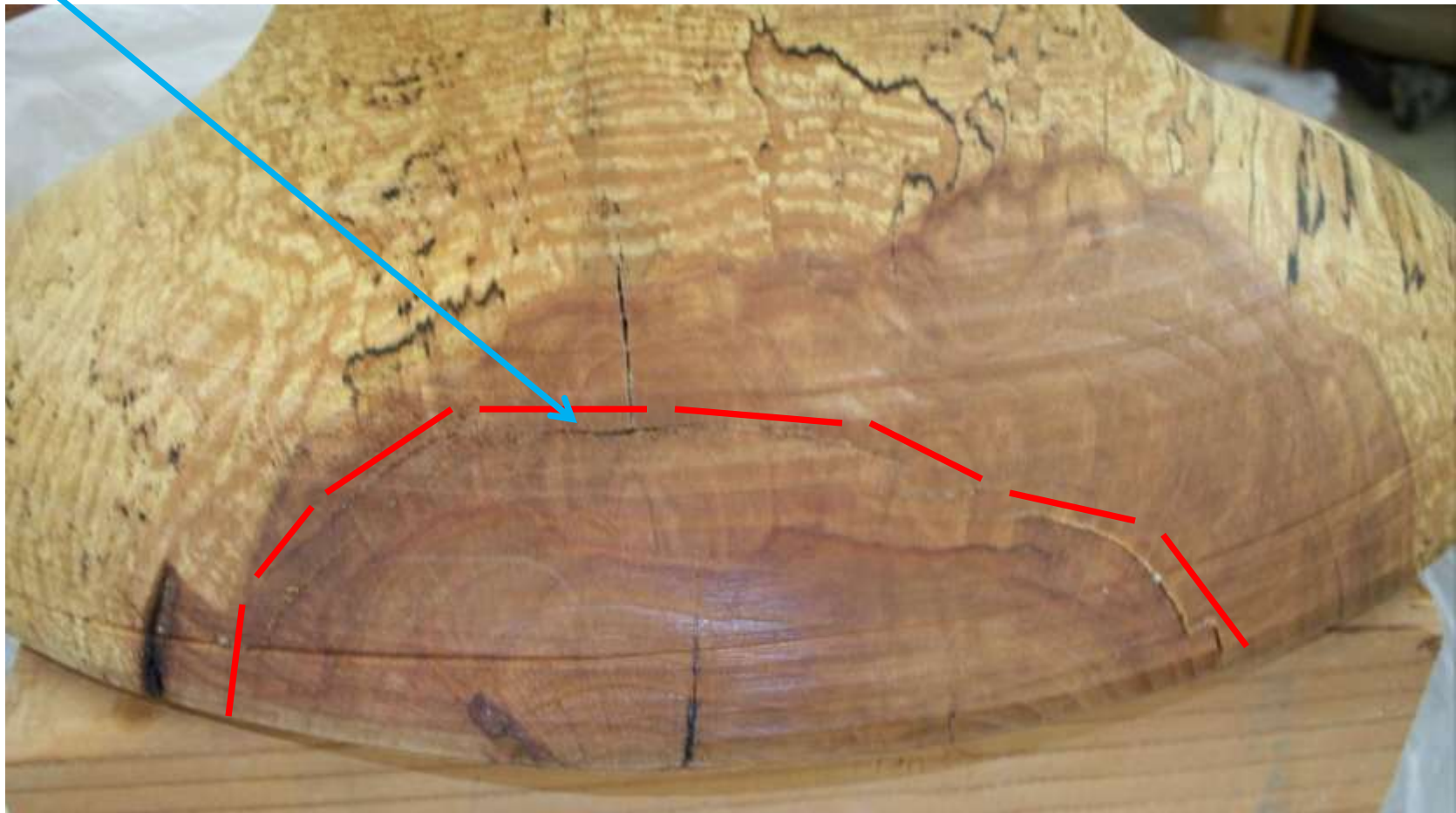
Possible methods:

1. Bowl Gouge or other lath tool?
2. Sealing with sanding sealer (shellac) to stiffen the grain.
3. Smoothing with a Card scraper
4. Sanding



Dealing with crooked grain woods

Heart wood trying to break out of a beech wood bowl.



Dealing with crooked grain woods

Shrinkage cracking of:

Limb wood



Heart wood or pith



Dealing with crooked grain woods

Needs
more
filling

A well
filled
crack



Dealing with holes, knots, cracks & crooked grain woods

Walnut Vase

Holes



Cracks



The End

Thanks to Michael O'Donnell for the use of some of his charts and graphs from his book for this presentation.

