Summary of Missouri Eastern Redcedar Industry Study

September 26-29, 1994

Summary Comments provided by: Scott Leavengood, Oregon State University Extension Agent and Larry Swan, Winema National Forest, USDA Forest Service

Introduction: Several key participants in the western juniper (*Juniperus occidentalis*) commercialization process visited eastern redcedar (*Juniperus virginiana*) facilities in Southern and Central Missouri. The purpose of the tours was to expose those involved to a more mature industry that utilizes a similar species. Information was gathered on wood characteristics, silvicultural practices, harvesting practices, raw material transportation, log storage, primary processing, drying, secondary and value-added processing, finishing, residue utilization, and marketing.

This tour was sponsored in part by the USDA Forest Service Pacific Northwest Region and the Missouri Department of Conservation.

Participants

USDA Forest Service Host:

Larry Swan
Resource Specialist
USDA Forest Service, Winema National Forest
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Klamath Falls, OR 97601
503-883-6714
FAX 503-883-6709

Missouri Hosts:

Shelby G. Jones
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Missouri Department of Conservation
2901 W. Truman Blvd.
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314-751-4115
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Robert Massengale
Rural Development Specialist
USDA Forest Service, State & Private Forestry
Cedar Creek Ranger District
4965 County Road 304
Fulton, MO 65251
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FAX 314-642-0119

Participants:

Glenn Burleigh
Burls by Burleigh
P.O. Box 351
Burns, OR 97720
503-573-7123

Mike Kilpatrick & Bob Graves
Juniper Plus, Inc.
P.O. Box A
Mt. Vernon, OR 97865
503-932-4455 or 932-4767
FAX 503-932-4457

Brent McGregor
Rocky Mountain Timber Products
P.O. Box 1477
Sisters, OR 97759
503-549-1322

Walt McGee
Diversified Fiber
21801 Hwy. 140E
P.O. Box 164
Dairy, OR 97625
503-545-6426
FAX 503-545-6639

Bob Powell
Sutton Mountain Juniper Products
16882 Thompson Creek Lane
Mitchell, OR 97750
503-462-3311

Dr. Ed Burke
Associate Dean and Professor
Wood Products and Utilization
University of Montana
School of Forestry, Forestry Building
Missoula, MT 59812-1063
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Klamath County Wood Products Extension Agent
Oregon State University
3328 Vandenberg Rd.
Klamath Falls, OR 97603
503-883-7131
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Mills Visited

Baker Products
Sam Baker, President
Rt. 3 Highway 21 North
P.O. Box 128
Ellington, MO 63638
314-663-7711
FAX 314-663-2787

Baker Products- Hardwood pallet mill and designer & manufacturer of horizontal and vertical band resaws. Baker Products uses the band resaws they manufacture to produce hardwood

pallets. Band resaw systems are made to suit custom orders. The saws themselves are purchased from Nicholson Co. in Mississippi for about $12 each. The saws are 1 inch wide with a kerf of 0.035 inches. Baker did not sharpen their saws. Each saw is run for about a day and a half and then the saw is cut up for scrap metal. Production is about 20 MBF/day with 6 employees. Baker Products employs a total of about 105 people in the saw manufacturing and pallet mills. Pallets are assembled green.

The tour group witnessed the first run of a new breakdown system that involved an investment of about $90,000. The new breakdown system eliminated the need to purchase cants from hardwood grade mills (mills that produce high quality lumber from the outer diameter of logs). Baker Products' new breakdown system begins by first splitting logs in half on a band resaw. Half-logs are then processed by successive resaws to create flitches that are 1 5/16 inches thick. The pieces are then resawn again to create 5/8 inch pallet deck boards.

Stoutenborough Products
Mark Stoutenborough
Route 2, Box 533AA
Cabool, MO 65689
417-962-3289

Stoutenborough Products- producers of mulch, shavings, & poultry bedding from eastern redcedar, western redcedar, and baldcypress. Eastern redcedar mulch is currently being used as a substitute for baldcypress mulch. Mr. Stoutenborough stated that labor costs are too high to package and deliver bagged mulch to individual retail outlets. Mulch is produced using a mobile Vermeer TG 400 tub grinder (call 1-800-829-0051 for Vermeer product information). The tub grinder is used at the mill site to avoid the high transportation costs associated with hauling slabs. Vermeer's tub grinder can fill a 100 yard trailer in about 40 minutes and costs about $150,000. One advantage of the Vermeer tub grinder, according to a Vermeer sales representative present during the tour, is the easily replaceable carbide tips on the machine's grinding heads. The replaceable tips allow for lower maintenance costs than with "hammer" type grinders.

Stoutenborough sells cedar mulch for $6/cubic yard at the mill (Mr. Stoutenborough stated that one cubic yard of eastern redcedar mulch weighs about 400 lbs) or about $30/ton picked-up. Delivered mulch prices were reported to be $10-$12/cubic yard to local markets (within approximately a 150 mile radius of Cabool) and as high as $17-$20/cubic yard in more distant Midwestern markets. Eastern redcedar shavings sell for $2.50 per bag (one bag is about 3 cubic ft.). Stoutenborough pays about $10/ton for western redcedar shavings.

Mr. Stoutenborough reported that eastern redcedar isn't used for charcoal because it burns so completely that no charcoal remains. He also mentioned that Stoutenborough Products was beginning to produce shavings for industrial packing (such as for dynamite).

Whittaker Farms
Cedar Sawmill
Thurman & Kenyon Whittaker
427 Whittaker Rd.
Bradleyville, MO 65614
Thurman 417-796-2620
Kenyon 417-796-2662

Whittaker Farms- The mill produces about 10 truck loads per week of 6-inch by 6-inch by 45-inch cants with a staff of 4 or 5 employees. Logs are purchased by the piece in 45-inch lengths. Price per piece for logs varied from 72¢ for a 5-inch log (average small end diameter) to $9.63 for a 16-inch log. Mr. Whittaker (Thurman) estimated that he is paying $250-$300/MBF for logs delivered to the mill. Cants (any size) are sold to remanufacturing facilities for $430/MBF f.o.b. mill. Residual material is converted to shavings and sold for $5/cubic yard to the poultry bedding market. Thurman stated that 50%-66% of their cants are sold to manufacturers who produce birdhouses for Wal-Mart. Cants are also sold to LWO near Portland (see address below). LWO manufactures cedar tongue and groove panelling.

LWO
Darrell Hungerford
3841 N. Columbia Blvd.
Portland, OR 97217
503-286-5372

Stanton Manufacturing Co., Inc.
George D. Stanton, President
P.O. Box 155
Lk. Rd. 54-15
Lake Ozark, MO 65049
314-365-2441

Stanton Manufacturing Co., Inc.- producers of eastern redcedar, ash, ponderosa pine, walnut, & oak novelty products. The average delivered cedar log diameter is 7 to 8 inches and the smallest top diameter accepted is 4 inches. Stanton also purchases 7-foot cedar poles for $1.10 per piece. Poles must be 4 inches or larger in small end diameter. Logs are purchased by the piece in 42-inch lengths. Some examples of prices paid at the mill for logs are: 35¢ for a 4-inch average quality log, $6.00 for an 18-inch average quality log, 50¢ for a 4-inch clear log, and $9.95 for an 18-inch clear log. Stanton prefers to purchase smaller diameter logs due to the smaller knots. Mr. Stanton recalled that the old log scaling method was the largest square that would come out of a log.

Mr. Stanton stated that cedar machines very well. Turnings can be done green and will stay round when dried. "Heart-in" novelty items such as pencil holders should be machined green and then dried. Secondary breakdown is accomplished with a pneumatic "shotgun"

Tannewitz bandsaw. The bandsaw was purchased used and now represents about a $5000 investment. Some of the equipment used to produce the various novelty items is no longer being made. Other equipment used in manufacturing novelty products includes a CNC router and a laser engraving set-up. The laser set-up represented an investment of about $27,000 (laser $18,000, scanner $1500, and computer). At the retail level, laser engraving costs approximately 50¢ per square inch of design. See the attached brochure for information about Epilog brand laser engraving equipment. BL Marketing in San Jose, California provides West Coast sales and service for Epilog laser engravers.

BL Marketing
Craig Abramson
Sales and Technical Support
1035 Minnesota Ave., Suite D
San Jose, CA 95125
Phone 408-289-9630
FAX 408-289-1850

Cedar is dried in a 7500 BF kiln (see the attached letter from Robert Massengale for drying information) and a Wood-Mizer vacuum dry kiln is used for drying 2x2 walnut squares. Novelty items are lacquer coated in an automated spraying line made by the Binks Manufacturing Company, Franklin Park, IL 60131. The mill employs about 50 people and has been in business since 1946.

Pryor Novelty Co.
Tim Pryor
P.O. Box 4
Tuscumbia, MO 65082-0004
1-800-325-0270
314-369-2355
FAX 314-369-2356

Pryor Novelty Co.- Cedar box manufacturer. Mr. Pryor estimated that 95% of the company's raw material is cedar. Pryor buys random thickness cants in 45-inch by 42-inch palletized bundles (approximately 800 BF/bundle) for $460/MBF. In the past, the company purchased 7-foot cants. Mr. Pryor feels that people have switched to shorter lengths for easier handling. Pockets of sapwood-colored wood within the heartwood are a common feature of both western juniper and eastern redcedar. Mr. Pryor stated that, with some of these pockets, a defect characterized by a longitudinally-oriented split occurs along the heartwood-sapwood boundary. Mr. Pryor termed this defect "yellow-check" and reported it to be a serious problem for the company. He also stated that lacquer emphasizes the defect.

Material is dried in a 10,000-12,000 BF kiln. Low temperatures are used (dry bulb less than 130° F and wet bulb less than 90° F). Mr. Pryor believes that cedar can be dried with a less sophisticated system than is necessary for some other species.

Pryor Novelty Co. makes many different kinds of boxes. Some boxes are built with an Abitibi hardboard top and bottom. Mr. Pryor found that sanding the hardboard surface prior to gluing eliminated the problem of weak glue bonds. Green box sides are glued together before being air-dried for 2 months. Kiln-dried top and bottom parts are then glued on with a different type of glue than is used for the box sides. The box is then sawn down the middle before the hinges are applied. Finally, lacquer is applied in a Binks Manufacturing Co. automated finishing line similar to the system used at Stanton Manufacturing Company. Eastern redcedar boxes wholesale for $2.00 per box (5 inches long by 3 inches wide by 2 1/8 inches high).

Cedar Milling
Vince, Roy, & Kip Borgmeyer
Route 1
Portland, MO 65067
314-254-3557

Cedar Milling Inc.- producers of 6x6 (4-sided) cants for log homes, log cabin siding, v-groove siding, tongue and groove cedar closet lining, and cedar shavings. Cedar Milling Inc. purchases 8-foot logs with a minimum diameter of 6 inches. A 9-inch diameter log costs about $7.20-$8.00 and a 12-inch diameter log costs about $12.60. Vince estimated that he pays about $300/MBF for logs.

In contrast to some of their competitors, Cedar Milling Inc. produces uniform length closet lining rather than random lengths. The company sells #1, ½-inch thick v-groove siding in 4, 5, and 6-inch widths for $1/square foot, and 3/4-inch thick siding for about $1.30/square foot. Grade 1, 2 1/4-inch thick clear boards sell for $1800/MBF. The company has experimented with fingerjointing to cut out low grade. Production is about 300-400 MBF/year with 5 employees. Vince Borgmeyer estimated overrun to be about 10-20%. About 7,000 cubic yards of shavings are produced per year.

National Novelty Company in Santa Barbara, California purchases 4,000 to 5,000 BF per year from Cedar Milling Inc.. Roy Borgmeyer said he was uncertain what National Novelty Co. did with the cedar. It was discovered at Crater Lake National Park in Oregon, that National Novelty manufactures wooden postcards and bookmarks. National Novelty's telephone number is 805-967-4796.

Wood Characteristics & Silvicultural Practices:

- Cedar appeared to have smaller knots than juniper (Walt McGee)
- Powderpost beetles are common in green logs (Tim Pryor, Bob Massengale)
- Bark pockets are a common occurrence in cedar boards(Thurman Whittaker, Bob Massengale, Shelby Jones)
- Cedar boards contain included sapwood pockets, similar to juniper (several participants)
- "Yellow check" (longitudinal splits associated with included sapwood pockets) possibly caused by cambial damage due to impact of some kind such as bullets, woodpeckers, hail, or deer rub (Vince Borgmeyer)

- Cedar has thinner bark than western juniper, possibly due to smaller diameter (several participants)
- The Missouri Department of Natural Resources has mandated eradicating cedar on glade sites (glade sites are areas with poor soils such as rock outcrops) on lands they control. (Shelby Jones)
- Virtually none of the cedar is managed, people are trying to eradicate the species (Shelby Jones)
- Pruning ruins logs due to rot, farmer-pruned fence-lines provide a good example (Vince Borgmeyer, Shelby Jones)
- 1-inch taper in a 42 inch bolt for small diameter logs, 2 inches of taper in larger diameter logs (Glenn Burleigh)
- Cedar does respond to thinning (Shelby Jones)

Harvesting & Raw Material Transportation:

- No wood is sold through brokers, brokers are used only for export logs (Shelby Jones)
- Harvesting is labor intensive, might see farm tractors used in a few cases (Shelby Jones)
- Loggers generally make about $120 per day (Thurman Whittaker)
- Landowners bring in pick-up loads of logs (Thurman Whittaker)
- Mills pay $250-300/MBF for delivered logs (Thurman Whittaker, George Stanton)
- Logs also sold by the cord. $60/cord is a common price (Shelby Jones)
- Could possibly use farm tractor with grapples, forks, or a platform to move logs to landing.
- Export logs (>10") comprise about 1% of the logs and sell for up to $1000/MBF (Shelby Jones).
- Logs harvested and processed in cold weather have better color and less insect trouble (George Stanton, Vince Borgmeyer)
- Common log lengths are 42 inches and 45 inches (easier to hand-load and transport via pick-up trucks- Tim Pryor)
- Annual eastern redcedar harvest in Missouri is approximately 7 MMBF (easily sustainable-Shelby Jones)
- One mill gets logs from about a 50-mile radius (Cedar Milling Inc.)
- Fall is the best time to harvest, second sap surge provides greatest decay resistance (Vince Borgmeyer)
- Logging & transportation costs are approximately $150-200/MBF (Thurman Whittaker)

The following information was provided by:

Gail Hopper
Specialty Products
P.O. Box 6
Seiling, Oklahoma 73663
Phone: 405-922-6040 or 4320

(Mr. Hopper is president of the Oklahoma Redcedar Association)

- Eastern redcedar acreage in Oklahoma is about 10 million acres.
- Specialty Products pays about $260/MBF based on "cedar scale"

$$cedar\_scale = \frac{[small\_end\_diameter\_inside\_bark\_(inches)]^2 \times length}{27}$$

- Mr. Hopper feels there is very little overrun, possibly 10%.
- 4/4 redcedar lumber is sold for $500-$600/MBF (cedar scale?)
- 4"x5", 5"x5", 4"x6", 5"x6", and random width 4-inch cants sell for $460-$550/MBF

Log Storage:

- George Stanton discussed end-coating cedar to prevent excessive end-splitting. Stanton already end-coats walnut. Ed Burke suggested this idea to juniper producers.
- Temperatures greater than 50° F and exposure to the sun will allow sapwood to stain due to high sugar content (Thurman Whittaker)
- End checks on logs in decks go about 1½ inches into the log (George Stanton, Thurman Whittaker)
- Material bought in cold weather is sawn before June (6 months maximum storage in winter, only 2 months at Cedar Milling Inc.)
- Don't let logs sit in yard in June, July, August (Roy Borgmeyer)
- Cull logs go to shavings (Cedar Milling Inc.)
- Minimum small end diameter is 4-6 inches (several mills)

Primary Processing:

- Milling costs are in the range of $100-$150/MBF
- No debarking done at any mill visited
- How will juniper's larger and harder knots affect sawing quality? (Walt McGee)
- How will the small saws, such as seen at Baker Products, work on frozen logs? (Walt McGee)
- Ed Burke mentioned a preference for vertical bandsaws and discussed the possibility of using a sharp-chain feed system with twin vertical bandsaws
- Primary breakdown systems involved Baker Band Resaws (Baker Products), scragg mills
- (Whittaker), and single circular saws (Stanton and Cedar Milling)
- Cedar Milling used pieces of wax-soaked stobs (short pieces of branch material) as saw guides

Drying:

- Ed Burke suggested using covered drying for short lengths and kiln drying in the finished product thickness.
- Eastern Oregon's climate lends itself well to air drying, kilns may be unnecessary. If kilns are used, dry short lengths (Shelby Jones)
- Based on information provided at Cedar Milling Inc., it appears that eastern redcedar's longitudinal shrinkage is much greater than juniper's (Ed Burke)
- Cedar is a naturally dry species, approximately 30% MC when green (George Stanton)
- Slabs for shavings sit outside for 6 months to dry (Thurman Whittaker)

Stanton Manufacturing- kiln schedule begins at 70-75° F then is raised to a final temperature of 130° F over a period of a week. No attempt is made to control humidity, although it is recommended to use more conservative temperatures and to keep the relative humidity higher than the Forest Products Lab's published schedule for eastern redcedar. George reported that they had little problems with star-checked knots. After dried to 8±1% final MC, cedar is let cool in the kiln overnight. Material is self-stickered.

Pryor Novelty Co.- Tim said that Pryor's old schedule for ½-inch material required 5 days when a maximum temperature of 130° F was used. Pryor's new schedule requires only 3 days. The schedule starts at 110° F, maintains a wet bulb temperature of 90° F and goes to a maximum of 140° F. A business associate in Arkansas recommended the low-tech procedure of "throwing a bucket of water on the floor" to add humidity if necessary. Material is self-stickered and no stain problems are reported. Tim said degrade was a minor problem at best. The 10,000-12,000 BF kiln is filled in 5 days.

Cedar Milling Inc.- Material was stickered and air-dried. Closet lining was dried to 8% MC (which was felt to be too dry) and house logs & larger lumber were dried to 15% MC. Vince mentioned that an 8-foot length of cedar will shrink 3/8-inch in length from green to dry.

Secondary & Value-Added Processing:

- Baker Band Resaws were used by Baker Products for primary breakdown and resawing flitches
- Stanton Manufacturing uses Tannewitz pneumatic shotgun bandsaws for resawing cants
- Cedar Milling Inc. used a SCMI bandsaw to resaw cants ("heavier duty than Tannewitz"- Shelby Jones)
- The two novelty companies (Stanton & Pryor) and Cedar Milling used many different types of resawing machines, moulders, and shapers to produce small novelty items and other products such as cedar boxes, special shapes (e.g. CNC routered key chains), laser engraved gift items, gavels, closet lining, log siding, and panelling.

Finishing:

- George Stanton mentioned that cedar is difficult to finish because the wood's oils can bleed through the finish and soften the finish. A special lacquer formulation is used.
- At Stanton Manufacturing Co. and Pryor Novelty Co., lacquer was applied by an automated spray booth system manufactured by Binks Manufacturing Company, Franklin Park, IL 60131.
- Stanton Manufacturing and Pryor Novelty Co. purchase lacquer from:

Don V. Davis Co.
4200 N. 2nd St.
St. Louis, MO 63147
Phone: 314-241-2077
FAX: 314-231-5132

Residue Utilization:

- Stoutenborough Products' operation is based entirely upon residue utilization. They use a mobile chipper at a sawmill to grind slabs into mulch. Stoutenborough purchases and bags shavings for horse and poultry bedding. Mark charges about $24/ton for mulch at his mill and about $110/ton for dry, bagged shavings ($2.50 per 45 lb. bag)
- Whittaker Farms uses a Jackson Wood Shaving Mill (made in Wisconsin) to shave dried slabs. The shaving mill uses 2 28-inch planer heads. The shavings sell at the mill for $5/cubic yard and are used for turkey bedding. The estimated cost of the Jackson Mill is $27,000.
- Stanton Manufacturing sells cedar shavings at the mill for $5.40/cubic yard. Stanton also sells bundles of slabs for $10. A bundle is approximately 1 cubic yard.
- Pryor Novelty Co. mentioned that thin green pieces of cedar are hard to hammer-up because the pieces wrap around the bars.
- Cedar Milling Inc. shaves cull logs and slabs in a home-made shaving mill. The shaving mill will process 1500-1700 lbs. per hour and 7,000 cubic yards/year. Cedar Milling charges about $6-$7/cubic yard for shavings picked up at the mill.

Marketing:

- The western juniper group summarized the possible product markets for western juniper as novelty items, cants, shavings, sawdust, house logs, boards, and panelling. Shelby Jones suggested exploring markets for shakes, shingles, birdhouses and pencils.
- Shelby Jones also mentioned that there are some cedar fence makers in Missouri, but no split rail fences. Glenn Burleigh felt there is a possibility for a juniper split rail fence market.
- Some participants felt the western markets for shavings may be for horse bedding in

California or poultry farms in the Willamette Valley.

- Some mention was made by several participants of running a test-marketing program for juniper. Juniper logs could be delivered to a Missouri manufacturer, and a fee paid to manufacture some novelty items. The juniper novelty items would then be test marketed in the West.
- A key concern of many participants was species recognition. Eastern redcedar is a well-established and recognized wood. Glenn Burleigh mentioned that it will be difficult for juniper to break into the closet lining market because of eastern redcedar's identity. What will the consumer's response be to juniper? We must try to avoid stigmatizing juniper as "Oregon's tallest weed" (Brent McGregor).
- Ed Burke recommended that the participants should form a manufacturing and marketing network.
- Bob Graves mentioned that juniper is expensive to mill. In addition, he felt that most of our juniper logs would end up on a cull pile in a Missouri mill. Prices will be tough to compete with.

Southern Oregon Prices for Cedar Products:

American Feed & Farm Supply, Klamath Falls:

1- 8 QT. bag of cedar shavings (Mallard Creek Co., Rocklin, CA) = $1.35
1 bale- 4 cubic feet of cedar mulch (no manufacturer listed) = $6.95
Rexius Forest Products (503-342-1835) in Eugene, OR manufactures bark products, mulch & shavings

Fred Meyer's, Klamath Falls:

Helmac Co. (manufacturers of "Mothball Alternatives")
P.O. Box 73
Flint, MI 48501
1-800-Helmac-3

Products below are made by Helmac:
1-2 oz. pkg. of 24 cedar balls (approximately 1 inch diameter) - $2.99
1-5.25 oz. pkg. of 4 cedar blocks (2 7/8 inches by 1 7/8 inches by 3/4 inches) - $2.99
1-0.68 oz. pkg. of 4 cedar sachets ("shavings in tea bags") -$2.99
1-2 oz. pkg. with 1 cedar hanger (block 7 3/8 inches by 1 7/8 inches by 3/4 inches with a brass hanger) - $2.99

Payless Drug Stores, Klamath Falls, OR:

Cedarfresh Products- (Manufacturers of "Mothball Alternatives")
A Division of the American Arbor Corporation
1800 Markley St.
Norristown, PA 19401
1-800-552-9500

Products below are made by Cedarfresh:
1-3 oz. pkg. of 36 cedar balls (approximately 1 inch diameter)- $5.19
1-5 oz. pkg. of 4 cedar blocks (2 7/8 inches by 1 7/8 inches by 3/4 inch)- $3.83
1-1.9 oz. pkg. of 2 cedar "stick-ons" (1 ½ inch diameter, 1 inch thick)- $4.13
1-3.9 oz. pkg. with 1 cedar hanger (block 7 3/8 inch by 1 7/8 inches by 3/4 inches with a brass hanger)- $3.53
1-28 oz. pkg. of 6 drawer liners (tongue & groove boards, 13 1/4 inches by 3 ½ inches by 3/8 inches) $8.33

Crater Lake National Park Gift Shop, Crater Lake, OR:

1- 4 oz. bag of cedar shavings (Blair Cedar & Novelty Works - $2.00
Rt. 1, 345 W. Hwy. 54
Camdenton, MO 65020)

Cedar boxes: (no manufacturer listed- very possibly Pryor's)
approximately 5 inch by 6 inch box with hardboard top & bottom and picture decoupaged on lid- $8.50
approximately 2 ½ inch by 3 inch box with large laser etched picture on the lid- $9.00

cedar eggs - $1.49 ea.
Stanton Manufacturing Co.'s horse memo holder (clothes pin mouth)- $3.95
6 inch square trivet- $6.50
~2 inch diameter pencil holder- $3.50

Wal-Mart, Klamath Falls, OR:

Eastern redcedar shavings: $1/ cubic foot for 5 cubic foot package (compressed to 2.2 cubic feet).
Western redcedar shavings- ½ cubic foot package-$1.24 (not compressed)

Country Home, Wild Bird Care Products
Cedar Works, Inc.
19 Cedar Drive
Peebles, OH 45660
513-587-2656

Country Home Birdhouse and birdfeeder prices ranged from $5 to $28. (see enclosed copy of flyer)

Woodcastle Manufacturing- Corvallis, Oregon
Frank Schoorl (503-754-9191) buys ¼ inch eastern redcedar plywood from States Dealer Supply in Eugene, Oregon for $40. The 4x8 sheets have a 3.6 mm eastern redcedar veneer on a plywood substrate. Woodcastle uses the plywood for drawer and closet lining.

Oregon State University Bookstore- Corvallis, Oregon
Cards of Wood (1-800-253-6002) makes wooden postcards and bookmarks of many wood species, including western juniper. Postcards (4 7/8-inches by 3 3/4-inches) sell for $1.50.

Special Note:

While at Pryor Novelty Company, the group collected a sample of insects that had bored into an eastern redcedar board. Shelby Jones sent the insects to Bruce H. Barrett, Missouri State Extension Entomology Specialist (Phone 314-882-3446, FAX 314-882-1469), for identification. Bruce identified the beetles as cedartree borers, *Semanotus ligneus (F.)*. These beetles are in the *Coleoptera* family and in the *Cerambycidae* genus.

Bruce reported that this type of borer occurs throughout the U.S. and that nearly all coniferous species are susceptible to attack, however Thuja (including western redcedar and others) and junipers are the borers preferred hosts. Eggs are deposited beneath the bark scales in the spring. The larvae feed beneath the bark, scarring the wood deeply. The larvae then bore into the sapwood and occasionally the heartwood before flying away. There is only one generation per year.

This borer may be the same one found in western juniper. David Bridgewater, USFS Entomologist (Phone 503-326-2728, FAX 503-326-5569), identified the samples sent to him as probably from the same genus (*Cerambycidae*). David's notes indicate that the beetle is attracted to dead or dying timber, and although they can emerge up to one year after the wood is in service, they do not survive as the wood season and dries. Kiln temperatures necessary to eliminate insect activity are higher than what currently appears to be recommended for western juniper (150° F or higher versus 130° F or lower).

Eastern Redcedar Log, Lumber & Other Product Buyers & Exporters

Jim W. Rhee
Wisewood International
21515 Hawthorne Boulevard, Suite 1010
Torrance, CA 90503
213-316-5343

Henry Oh
EXIM, International
#9 New Haven
Laguna Niguel, CA 92677
714-248-8873

Paul Niedermeyer
Niedermeyer Intertrade Corp.
13610 SW Chariot Court
Beaverton, OR 97005
503-524-8506

Mike Brittain
General Delivery
Kirbyville, MO 65679
417-334-5429

Simon Stauber
8913 Sylvia Ln.
Philadelphia, PA 19115
215-676-3732

United States Department of Agriculture | Forest Service | Northeastern Area State & Private Forestry
Caring for the Land and Serving People
4965 Co. Rd. 304
Fulton, MO 65251
(314) 642-6726 (TT)
FAX(314) 642-0119

October 12, 1994

Mr. Larry Swan
Resource Specialist
Winema National Forest
2819 Dahlia St.
Klamath Falls, OR 97601

Dear Larry:

Sorry for the delay in getting this information to you, but I wanted to check several other sources before telling you what I thought would work. Sort of protecting my backside, if you understand.

First of all, I will not repeat the Kiln Drying Schedule that is in the Dry Kiln Operator's Manual (DKOM) because anyone who runs a kiln has the book and is familiar with how to use the tables to prepare a schedule. And I think most of the builders of dry kilns use the same book as their instructions on how to run a kiln. The DKOM is widely accepted in the trade. It was published by the Forest Products Laboratory after a lot of research, and I believe its Agriculture Handbook 188 from the GPO.

What we learned on this tour was that at least two of our cedar producers use the manual but have adapted the schedule as a result of their experience in drying redcedar. I called a wood-drying expert I know too, and he also said if he were drying redcedar he would change it too. O. K. The book schedule is what they call T5. But this calls for a starting temperature of 120 degrees F and goes up to 160 degrees F to finish. But both George Stanton at Lake Ozark and Tim Pryor at Tuscumbia said they start lower (about 110 degrees F) and finish at 130 degrees F. I agree with this. In fact, my expert friend said that you actually can dry redcedar at 80 degrees F, if you move enough air over it, but of course this will take more time and would be more costly. We do know that the higher you raise the temperature the more oil you will lose, and thus a balance between time and temperature needs to be made.

I also called Bill Raynor at Eldon, Missouri who used to be in the redcedar closet lining business (we did not visit him on the tour) and he said that they had used the temperature of 100 degrees F and good air movement to dry the slats for closet lining. These were cut from slightly air-dried cants (called 4 by wides) and were 3/8-inch thick. Using this system they dried the slats to 8 to 10 percent moisture content in 10 hours. He presently dried some redcedar 4/4 commercially, but he puts it in his standard package dry kiln with soft maple and loads the redcedar at the front so he can take it out when its dry, which is before the soft maple is dry. He just stops the run and opens the door and pulls the redcedar and closes it back up and goes on. He says that he takes regular kiln samples from the redcedar just like the maple and pulls it at 8 to 10 percent.

Mr. Larry Swan

The heat source for the slat system was just a hot water radiator which was sufficient to get the 100 degree F temperature. I think, too, the key here was good air movement over the load.

In my opinion, I would begin your tests at the 100 degree F level and move as much air over it as you can. This is conservative and you may find the western juniper will stand a little higher temperature. But I see the goals as 1) to keep as much cedar oil (odor) in the wood as possible, and 2) to reduce the splitting around the knots and checks as much as you can, and to come out with a product dried to about 8 to 10 percent moisture content. A word of caution: Do not use a steam spray as this will volitilise the oils. Dry the wood without any additional moisture, although this may slow you down a little. Also, my expert friend, Gene Wengert said do not exceed a 35 degree F depression at any time in the kiln, even though the DKOM does call for this. This will maintain some of the moisture in the kiln and hopefully reduce checking.

I hope that this is helpful to you Larry. I checked several manuals and articles and there is just not a lot written about redcedar (eastern red, that is) so I guess we will just rely on those people in the business.

If I can be of further help on this please don't hesitate to call and I'll dig into it some more. Let me know how it goes. Good luck on the project - we enjoyed having you guys here.

Sincerely,

Robert Massengale,
Rural Development Specialist

Table 7-17—Code number index of moisture content schedules[1] recommended for kiln drying 4/4, 6/4, and 8/4 softwood lumber

Species	Schedules for lower grades[2]			Schedules for upper grades[2]		
	4/4	6/4	8/4	4/4	6/4	8/4
Baldcypress	—	—	—	T12-E3	—	T11-D2
Cedar						
Alaska	—	—	—	T12-A3	—	T11-A2
Atlantic white	—	—	—	T12-A4	—	T11-A3
Eastern redcedar	—	—	—	T5-A4	—	T5-A3
Incense	—	—	—	T11-B5	—	T10-B4
Northern white	—	—	—	T12-B4	—	T11-B3
Port-Orford	—	—	—	T11-B4	—	T10-B3
Western redcedar						
Light	T9-A6	—	—	T10-B5	—	T10-B3
Heavy	—	—	—	T5-F4	—	T5-F3
Douglas-fir						
Coast region	T7-A4	—	[3]T7-A4	T11-A4	—	T10-A3
Inland region	[4]T9-A4	—	[4]T9-A4	—	—	—
Fir						
Balsam	—	—	—	T12-E5	—	T10-E4
California red	—	—	—	T12-E5	—	T10-E4
Grand	—	—	—	T12-E5	—	T10-E4
Noble	—	—	—	T12-A5	T11-A4	T10-A3
Pacific silver	—	—	—	T12-B5	—	T10-B3
Subalpine	—	—	—	T12-B5	—	T12-E
White	T9-D6	—	T9-D5	T12-E5	T11-E5	T10-E4
Hemlock						
Eastern	—	—	—	T12-C4	—	T11-C3
Western	[3]T11-E5	—	T11-E5	T12-C5	T11-C5	T11-C4
Larch	[4]T7-C5	—	[3]T7-C5	T9-B4	T7-C4	T7-C3
Pine						
Eastern white						
Regular	T9-C5	—	T9-C4	T11-C5	—	T10-C4
Jack	T9-C4	—	T9-C3	—	—	—
Lodgepole	T5-C5	—	—	T10-C4	—	T9-C3
Ponderosa						
Heartwood	T9-A6	T7-A6	T5-A5	—	—	—
Sapwood	T11-C7	—	—	T9-C6	T7-C5	T7-C5
Antibrown-stain	—	—	—	T7-E6	—	T7-E5
Red	—	—	—	T12-B4	—	T11-B3
Southern yellow	T12-C5	—	—	T13-C6	T12-C5	T12-C5
Sugar						
Light	T9-E7	T7-E6	—	T5-E6	T5-E6	T5-E5
Heavy	—	—	—	T5-F6	T5-F6	T5-F5
Western white						
Regular	T9-C6	—	[4]T7-C6	T9-C5	T7-C5	T7-C4
Water core	T9-E6	—	—	—	—	—
Redwood						
Light	—	—	—	T5-D6	—	T5-D4
Heavy	—	—	—	T4-F5	T3-F5	T3-F4
Spruce						
Eastern (black, red, white)	—	—	—	T11-B4	—	T10-B3
Englemann	T7-B6	T5-B5	[3]T5-B5	T9-E5	—	T7-E4
Sitka	T7-A5	—	—	T12-B5	T12-B4	T11-B3
Tamarack	—	—	—	T11-B3	—	T10-B3

[1]Schedules are given in tables 7-20 and 7-21.
[2]Lower grades include commons, dimension, and box; upper grades include clears, selects, shop, and factory; also tight-knotted paneling.
[3]Maximum wet-bulb depression 25 °F.
[4]Maximum wet-bulb depression 20 °F.

Table 7-15—Moisture content schedules for softwoods

Dry-bulb temperature step no.	Moisture content at start of step (percent)	Dry-bulb temperatures (°F) for various temperature schedules													
		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
1	>30	100	100	110	110	120	120	130	130	140	140	150	160	170	180
2	30	105	110	120	120	130	130	140	140	150	150	160	170	180	190
3	25	105	120	130	130	140	140	150	150	160	160	160	170	180	190
4	20	115	130	140	140	150	150	160	160	160	170	170	180	190	200
5	15	120	150	160	180	160	180	160	180	160	180	180	180	190	200

Table 7-16—Moisture content wet-bulb depression schedules for softwoods

Wet-bulb depression step no.	Moisture content (percent) at start of step for various moisture content classes						Wet-bulb depressions (°F) for various wet-bulb depression schedules							
	A	B	C	D	E	F	1	2	3	4	5	6	7	8
1	>30	>35	>40	>50	>60	>70	3	4	5	7	10	15	20	25
2	30	35	40	50	60	70	4	5	7	10	14	20	25	30
3	25	30	35	40	50	60	6	8	11	15	20	25	30	35
4	20	25	30	35	40	50	10	14	15	20	25	30	35	35
5	(1)	20	25	30	35	40	15	20	20	25	30	35	35	35
6	—	(1)	20	25	30	35	20	25	25	30	35	35	35	35
7	—	—	(1)	20	25	30	25	30	30	35	35	35	35	35
8	—	—	—	(1)	20	25	30	35	35	35	35	35	35	35
9	—	—	—	—	(1)	20	35	35	35	35	35	35	35	35
10	15	15	15	15	15	15	50	50	50	50	50	50	50	50

(1) Go directly to step 10..

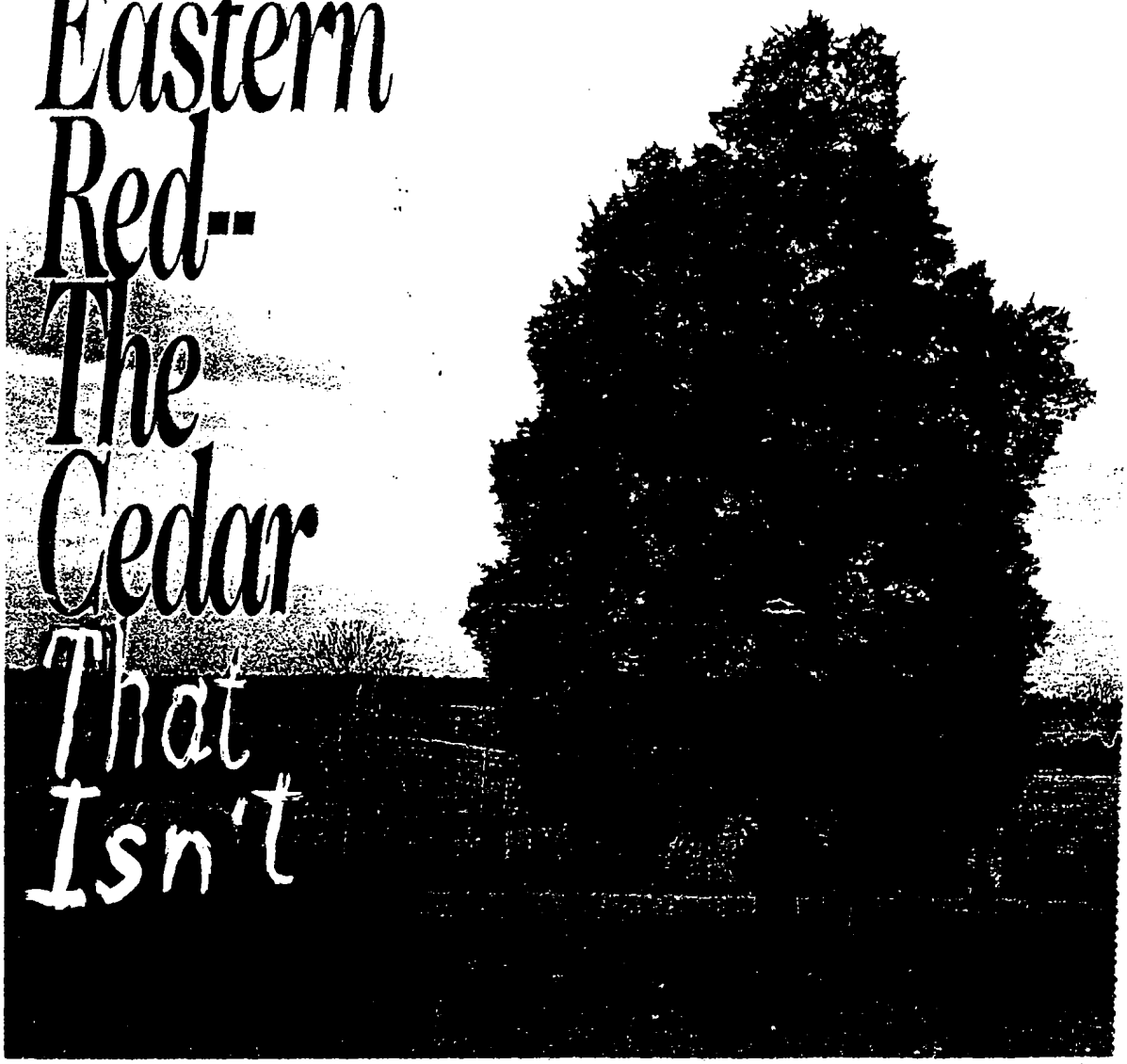
3/4 4/4

Table 7-33—Approximate kiln-drying periods for 1-in lumber[1]

Species	Time (days) required to kiln dry 1-in lumber: 20 to 6 percent moisture content	Time (days) required to kiln dry 1-in lumber: Green to 6 percent moisture content
SOFTWOODS		
Baldcypress	4-8	10-20
Cedar		
Alaska	—	4- 6
Atlantic white	—	8-10
Eastern redcedar	2-3	6- 8
Incense	—	3- 6
Northern white	—	8-10
Port-Orford	—	4- 8
Western redcedar	—	10-15
Douglas-fir		
Coast type	—	2- 4
Intermediate type	—	4- 7
Rocky Mountain type	—	4- 7
Fir		
Balsam	—	3- 5
California red	—	3- 5
Grand	—	3- 5
Noble	—	3- 5
Pacific silver	—	3- 5
Subalpine	—	3- 5
White	—	3- 5
Hemlock		
Eastern	—	3- 5
Western	—	3- 5
Larch, western	—	3- 5
Pine		
Eastern white	2-3	4- 6
Lodgepole	—	3- 5
Ponderosa	—	3- 6
Red	—	6- 8
Southern yellow		
Loblolly	—	3- 5
Longleaf	—	3- 5
Shortleaf	—	3- 5
Sugar		
Light	—	3- 4
Heavy	—	5-10
Western white	—	3- 5
Redwood		
Light	3- 5	10-14
Heavy	5- 7	20-24
Spruce		
Eastern, black, red, white	—	4- 6
Engelmann	—	3- 5
Sitka	—	4- 7
Tamarack	—	3- 5
HARDWOODS		
Alder, red	3- 5	6-10
Apple	4- 7	10-15
Ash		
Black	5- 7	10-14
White	4- 7	11-15
Aspen	3- 5	6-10
Basswood, American	3- 5	6-10
Beech, American	5- 8	12-15
Birch		
Paper	—	3- 5
Yellow	5- 8	11-15
Buckeye, yellow	5- 8	12-16
Butternut	5- 8	10-15
Cherry, black	5- 7	10-14
Chestnut, American	4- 8	8-12
Chinkapin, golden	7-12	22-28
Cottonwood	4- 8	8-12
Dogwood, flowering	5- 8	12-16
Elm		
American	4- 6	10-15
Rock	5- 8	13-17
Hackberry	4- 6	7-11
Hickory	4-12	7-15
Holly, American	5- 8	12-16
Hophornbeam, eastern	5- 8	12-16
Laurel, California	5- 7	10-15
Locust, black	5- 8	12-16
Madrone, Pacific	8-11	15-20
Magnolia	4- 6	10-15
Mahogany	4- 7	12-15
Maple		
Red, silver (soft)	4- 6	7-13
Sugar (hard)	5- 8	11-15
Oak		
California black	6-10	25-35
Live	—	30-40
Red	5-10	16-28
White	6-12	20-30
Osage-orange	5- 8	12-16
Persimmon, common	5- 8	12-16
Sweetgum		
Heartwood	8-12	15-25
Sapwood	5- 7	10-15
Sycamore, American	4- 7	6-12
Tanoak	7-12	24-30
Tupelo		
Black	4- 6	6-10
Water	5- 7	6-12
Walnut, black	5- 8	10-16
Willow, black	5- 8	12-16
Yellow-poplar	3- 6	6-10

[1]Because of the many factors affecting drying rate and the lack of specific data covering each case, wide variation from these values must be expected. These values represent only a general idea of average drying periods and should not be used as time schedules. Some of the drying times shown were obtained from commercial kiln operators.

Eastern Red-- The Cedar That Isn't

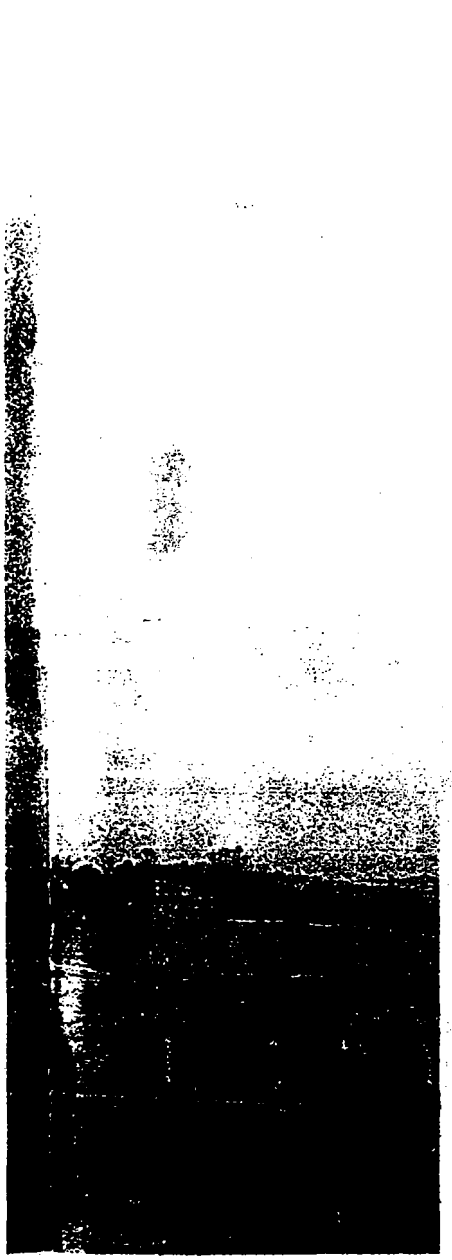


Drink it, write with it, pin your hopes on it—but don't take for granted this pioneer with the misleading name.

By NANCY ROSS HUGO

Photos by the Author

Everybody knows the eastern redcedar. It's the prickly, pyramid-shaped tree invading pastures and roadsides in the eastern half of the U.S. It's the evergreen with the peeling bark beside the barn. It's the Christmas tree that looks perfect at a dis-



The most widespread conifer of the eastern U.S., the eastern redcedar produces small bluish-colored fruits (above) on trees bearing female flowers. The cones below are light green in spring, turn dark blue in fall, and mature in one season.

Ernest Wilson

tance but up close is the one with the double trunk and rusty foliage. It's the stuff of fence posts and hope chests and pencils (or it once was), and it's one of the most wide-ranging trees in the East. Isn't it strange that, as well as we think we know the eastern redcedar, we're not even right about its name?

Any botanist will tell you the United States has no native cedars. The true cedars, members of the genus *Cedrus*, grow in the Himalayas and along the shores of the Mediterranean. The cedar of Lebanon, most celebrated member of the family, isn't even a close relative of our "cedars."

So if they're not cedars, what are they? They're junipers. The tree that we call the eastern redcedar is actually *Juniperus virginiana*, a member of the cypress family. If that's not perfectly clear, try this: Our cedars (which are really junipers) are members of the cypress family; true cedars (members of the genus *Cedrus*) are members of the pine family.

If they'll always be cedars to you, don't despair. Laymen have been calling any tree with spice-scented wood "cedar" for centuries, and there's no sign of that changing anytime soon. What's important is knowing there may be more to this tree than we thought.

Take the berries. In the winter landscape, nothing is more beautiful than a cedar loaded with blue berries. But they're not really berries at all; they're cones.

The fruit of the eastern redcedar is actually a cone embedded in a fleshy growth that looks like a berry. The scales of the female cedar flower fuse over the ovules as the cone matures to create what looks like a fleshy berry.

In a single season a mature female cedar may bear as many as a million and a half berries (or cones). They are of low quality as wildlife foods go—dogwood berries are more nutritious—but during times of scarcity they are an important food source for 71 species of animals, including 63 species of birds.

Humans have been using the berries medicinally for centuries. In his *Medical Botany of the Confederate States*, Francis Porcher recommended a redcedar salve for blisters, redcedar oil for rheumatism, and a redcedar drink as a remedy for dropsy. "Take one handful of the seed of cedar, the same of mullein, the same of root of dogwood; put

Eastern red's range

into two quarts and a pint of water, boil down to one quart, and add one gill of whiskey. Dose, a wineglassful night and morning."

If that sounds outdated, remember that you may be taking a cedar "cure" yourself if you're a drinker of martinis. It is the berries of a close relative of our eastern redcedar, *Juniperus communis* (common juniper), that are used to flavor gin. In fact, the word *gin* comes from the French word *genievre*, meaning juniper berry.

It is the berries of *Juniperus communis*, not the berries of *Juniperus virginiana*, that are usually employed in cooking. Berries from *communis* are used widely in Europe to flavor game marinades, stews, and sauerkraut, and it is those berries that we buy

Nancy Ross Hugo works as a freelance journalist and is a tree fancier making her home in Ashland, Virginia.

here in the spice section of the grocery store.

Juniperus virginiana berries can reportedly also be used in small quantities for flavoring, but be careful. Poison-control centers will tell you that the edibility of redcedar berries is in question and that taken in large quantities they can cause irritation of the urinary tract and kidneys. "Until proven otherwise," experts advise, "consider all parts of the plant toxic."

The blue berries are the mark of a female cedar. They are produced annually, although every two or three years there is a larger-than-average crop. Males have tiny yellow cones (and these look like cones) that appear at the tips of the twigs. Occasionally, a male cedar also has a few blue berries.

So familiar is the appearance of the cedar that most people look right past it, but anyone who has ever searched for the perfect redcedar Christmas tree is intimately acquainted with its peculiarities. Not only is it a question of shape—how to find a cedar that looks like a spruce or fir—but redcedars vary highly in color and in texture of foliage.

Young redcedars are decidedly columnar, resembling umbrellas before they are opened. Old cedars tend to spread out and flatten at the top, as if they were partly open umbrellas.

Redcedar foliage is a warm and subtle green that appears bronze-tinted if you like it, rusty if you don't. Part of the brownish cast is due to natural coloration, and part is caused by old foliage that stays on the tree several years after dying. Redcedars also tend to "brown-out" during the winter and green up a bit in the spring. Cedars have both juvenile and mature foliage, and the foliage on the tiniest new cedar in the pasture looks different from that of an old

turn to page 65

Hugging Virginia's largest redcedar is Paul Key, who lives on the farm where the tree grows.

How Birds Build Fencerows

Any farmer will tell you that birds are responsible for the cedars growing along his fencerows. Birds eat the cedar berries, perch on fences, and deposit the seeds with their droppings. Rain washes the seeds to the ground, where they germinate and form a row that sometimes outlasts the fence.

Biologist Anthonie Holthuijzen is an expert on the ecology of redcedars, and he spent years studying how birds disperse seeds. One year from January through April, for example, he counted and removed bird droppings along a 317-yard fence in southwest Virginia. Here's what he found:

In 365 droppings, he counted 1,006 redcedar seeds. They formed a seed shadow of the parent trees, decreasing in density with increasing distance from the seed source (the blue-berried trees along the pasture border).

The birds he observed feeding most consistently on redcedar berries were yellow-rumped warblers. The warblers accounted for the slow, sustained removal of cedar berries, but it was flock feeders like the cedar waxwing, robin, and starling that ate most of the cedar berry crop.

A cedar waxwing can consume 53 cedar berries an hour, a flock can deplete a tree's entire fruit crop in a matter of days, and it takes only 12 minutes for the cedar seed to pass through the cedar waxwing's system.

Other birds Holthuijzen observed dispersing cedar seed included bluebirds, mockingbirds, downy woodpeckers, and wood thrushes.

A cedar waxwing (above) can eat 53 redcedar berries an hour.

Not only do the birds help cedar seeds put distance between themselves and the parent tree, but Holthuijzen found that when the seeds pass through the birds' systems, the digestion process actually helps the germination. The birds depulp the seeds – making them three times as likely to germinate – and chemical action in the birds' digestive systems may further improve germination by a factor of one to four.

Since cedar seeds seldom remain viable in the soil more than 15 months, the boost the cedar receives from the bird is undeniably a boon. –NANCY ROSS HUGO

The Cedar That Isn't

continued from page 58

slow-growing tree. The foliage on the new cedar is sharp and lance-shaped. The new foliage on older trees is also lance-shaped, but the mature foliage is more like that of a cypress: scale-like and pressed to the stem. Together the branchlets form flattened green sprays.

Often the most beautiful part of an old cedar is its bark. *Exfoliating* is the term horticulturists use to describe this kind of bark. It is extremely thin (which makes cedar particularly susceptible to fire) and peels off in long, vertical strips. The peeling bark gives redcedars a wonderfully hoary appearance, and the trunks themselves are often fluted like classical columns. A grove of old cedars with high limbs and exposed trunks is rare, but where it exists, the effect is beautiful.

Most observers consider redcedars slow-growing, and from a lumberman's standpoint they are, but on good soils their height gain can be relatively rapid. It takes a long time to grow a marketable cedar log, but not so long to get a good-sized tree. A neighbor of mine dug an 18-inch cedar out of a ditch bank and transplanted it to his yard. In seven years it was 18 feet tall.

The average cedar is 40 to 50 feet tall at maturity, although on good sites they've been known to reach 120 feet in height. Most of the largest and oldest redcedars in the United States are gone, but a few champions are still around. According to the American Forestry Association, the largest eastern redcedar in the country grows in Coffee County, Georgia, and is 17.5 feet in circumference and 55 feet in height. The oldest age reported for a cedar is 300 years.

Redcedar wood is highly valued for its fragrance, beauty, and longevity. It is the unmistakable red heartwood that is responsible for the "red" in the common name. The sapwood, equally stunning, is white. The wood's fragrance and reputed ability to repel moths makes it the wood of choice for closets, drawer linings, and hope chests. Lucky pets sleep on mattresses stuffed with cedar chips.

At one time the most intensive use of the wood was for pencils. The oldest pencil manufacturer in the South, the

Musgrave Pencil Company in Shelbyville, Tennessee, used redcedar wood exclusively from the day the first pencil rolled off the company's assembly line in 1925 until the 1950s.

Everything about the wood made it perfect for pencils. It was workable, which meant it could be grooved accurately to accommodate lead. It cut easily even when cut obliquely to the grain, the way a pencil is sharpened. It could be whittled easily with a dull pocket knife. The wood finished with a smooth surface, which made it comfortable to hold, it took paint and varnish well, and it didn't have an unpleasant taste if it wound up in the mouth.

The only problem was that the demand for pencils grew faster than the cedars did. Today 95 percent of the pencil slats in this country and 65 percent of those worldwide are made by two California companies that employ a fast-growing tree, the California incense-cedar. Dyes and waxes are added to make the incense-cedar more machinable and to give it the red color we expect of cedar pencils.

The Musgrave Pencil Company, which now uses incense-cedar as well, still has a few redcedar slats left, and the founder's grandson, Henry Hulan, hopes to make them into commemorative pencils someday. "Tennessee redcedar pencils sure did smell good when you sharpened them," he recalls.

Hulan also remembers that when his grandfather started the company, he traded farmers wire for their cedar rails and fence posts. "I've got pictures of horse-drawn buggies filled with those old cedar logs and posts pulling up to the factory," he says.

Because it is so durable when in contact with the soil, redcedar is still a preferred wood for fence posts. "No wood," says Taylor Moore of E.T. Moore Lumber Company, "lasts longer in the ground." When Moore's company helped dismantle sheep sheds built for stockyards in Richmond, Virginia, in the early 1900s, it found that the builders had dug holes and stuck cedar trees directly in the ground. Although everything else had rotted, the cedar frameworks were sound, and Moore's company recycled the wood.

The eastern redcedar is a pioneer species, which means it is one of the

first plants to colonize disturbed land. Although cedars can't compete on better soils (where hardwoods shade them out), they are more than a match for grasses. And they pop up like weeds in untended pastures where conditions are too dry and poor for other species.

Cedars are generally associated with alkaline soils, but they actually tolerate a wide range of acidity—from pH 4.7 to 7.8. They are often found growing in alkaline soils because the high calcium content in their litter tends to raise the pH. Studies in the 1950s found that redcedar litter helps to rehabilitate the soil in old fields and that the soil under redcedar plantations has properties more conducive to earthworm activity than does the soil under pine plantations.

Redcedars and all their juniper relatives are so easily grown that one gardening expert wrote, "If you can't grow junipers, don't bother trying to grow anything else." They will thrive on poor dry soils where almost nothing else can succeed, and few insects cause them serious damage. Their main requirement is sun. Grown in the open, they get fat and full; in the shade they grow thin and ragged. Because of their deep lateral roots, they're difficult to move from one location to another, but many a tiny cedar has been successfully transplanted from the field to the yard.

To my mind, the redcedar is the most valuable of evergreens. It has fragrance, beautiful berries, and interesting bark. It is tidy, easy to grow, and becomes more beautiful with age. If the redcedar were rare, it would cost a fortune. As it is, all it takes for this scrub tree of marginal lands to become the specimen tree of magnificent landscapes is time.

And time is all it takes to become better acquainted with the familiar eastern redcedar. AF

FORESTS IN THE MIDST OF REVOLUTION

continued from page 35

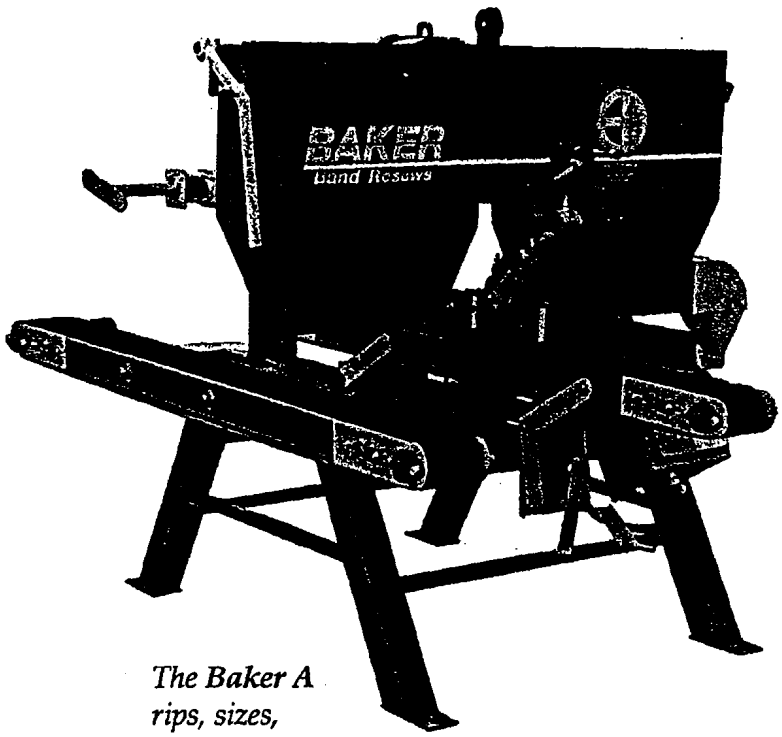
clearcutting. Those controversies grow more severe as homes continue to be built adjacent to the forest and on private plots within the forest itself. Again, a familiar-sounding situation.

But today there is a wild-card issue in Hungary—as in all of Eastern Europe—that overrides every other concern. Who owns these forests? And how will they be managed as the country seeks to convert from a communist satellite to a free society? How can the country create a market-based economy? Who will pay for forest products? How much? Can the sale of forest products support the cost of managing the forest? Who will pay the forester's salary? On what basis? These questions, asked as logically about farms and factories, apartment houses and power plants, absorb everyone's energy in Eastern Europe these days. The revolution that shattered nearly a half-century of communist rule has only just begun. After the political changes must come major economic and environmental changes, and just how to manage this transition is a challenge of overwhelming magnitude.

I visited Budapest in June with a group of westerners invited to a workshop with Hungarian environmentalists and government officials. Sponsored by the Soros Foundation and hosted by the Independent Ecological Center, the workshop was aimed at helping to develop a strategy for the fledgling environmental movement in Eastern Europe. I went with the feeling I would learn more than teach, and on that score I wasn't wrong. No amount of study on either current events or history can prepare an outsider for the earth-shattering changes that are rippling through Eastern Europe today.

We were, however, able to identify some strategic directions that we can only hope will be helpful. In countries where there has been little or no private sector for a generation or more, people don't know how to run a private organization. We helped with basic ideas—how to set up a program and a budget, how to raise public consciousness and affect political decisions. On those subjects, and on the challenge of setting a limited agenda and focusing on critical issues, we

This may be the most profitable machine you ever own.



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structed from this wood is also subject to serious damage. Rapid utilization of girdled or felled trees and the storage of logs in ponds are effective control practices.

Physocnemum brevilineum (Say), the **elm bark borer**, breeds in the corky bark of living elm trees in southern Canada and the Eastern and Central States *(514)*. Adults are dark brown to black and from 9 to 20 mm long. The elytra are frequently bluish with three longitudinal white marks. Eggs are deposited beneath bark scales. The larvae feed in the phloem, constructing meandering, frass-packed galleries. The bark over these galleries dies and falls off. *P. violaceipenne* Hamilton breeds in the small branches of white oak in eastern Canada and the Northeastern States. Adults are 8 to 17 mm long.

Parandra brunnea brunnea (F.), the **pole borer**, occurs in central and eastern North America, and attacks a wide variety of hardwoods and conifers. Logs, poles, and other wood products in contact with the ground, such as untreated crossties and structural timbers, are also infested. The adult is flat, shiny, mahogany-brown, and is from 8 to 21 mm long. Full-grown larvae taper slightly toward the rear and are about 30 mm long.

Adults appear from July to October and deposit their eggs singly but close together, deep in either solid or decayed wood. Attacks on living trees are usually made at places where the wood is exposed such as at scars, wounds, or broken branches. The larvae feed in the wood for 3 or 4 years. Although the wood may be completely honeycombed, a covering shell of sapwood is always left intact. Pupation occurs in a cell in the wood. Many of the adults do not emerge from the wood but mate and lay eggs in the cavities in which they are working. In living wood, the wounds where the larvae gain entry will often heal over, leaving no external signs of attack. Shade trees, telephone and telegraph poles, and structural wood in moist locations or in contact with the ground are subject to severe damage. A considerable degree of protection of valuable shade trees can be provided by keeping them healthy, by the removal or treatment of exposed dead and decaying wood, and by covering pruning scars with paint.

The **cedartree borer**, *Semanotus ligneus* (F.), occurs throughout the United States. Practically all species of conifers are subject to attack, but dying and recently felled thujas and junipers are preferred. Adults are dark brown to black and from 7 to 16 mm long. The thorax is rounded and hairy, except for several bare spots on the disk. The elytra are sometimes black, but are usually dark blue with yellow or orange markings.

Eggs are deposited beneath bark scales in the spring. The larvae feed first beneath the bark, scarring the wood deeply. Then, they bore into the sapwood and occasionally the heartwood. There is one generation per year. A related species, the **firtree borer**, *S. litigiosus* (Casey), has been recorded from the Eastern United States, but is primarily western in distribution. Its hosts include several species of true firs, Douglas-fir, larch, plus several spruces. Male adults are usually all black, whereas females are black, marked with orange.

The genera *Asemum* and *Arhopalus* contain a number of species that breed in the sapwood and heartwood of the stumps of felled trees and in the lower portions of dying trees. When abundant, the larvae may destroy large portions of the sapwood. *Asemum striatum* (L.) and *Arhopalus rusticus obsoletus* (Randall) are common eastern species.

Tragosoma depsarius (L.), the **hairy pine borer**, occurs from coast to coast in southern Canada and the Northern States. It also occurs southward through the

Classifieds

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Buying walnut lumber two common and better.

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1-80 ft. 3 strand green chain with drive heavy duty

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Steam Boiler, 36 H/P Bryan model CL 150-S—15, L. P. Gas. Put into service October 1984, used for 6 years to condition and stress relieve lumber in dehumidification kilns. New Cost-$8,500.00. Selling Price $3,000.00.

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6-Tannewitz 36" band saws with air shotgun feed $4,950.00 each.
36 x 24 Stedman Hammermill with infeed chute $5,750.00 each.

Contact: Osage Products
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120 Prentice 20' boom, knuckleboom loader, [illegible] paint, pump and wet kit.

Franklin Prehauler 170xL 453 Detroit Diesel, 28L tires 90% rear, 40% front, good condition.

Contact: Ace Log & Lumber Co.
816-456-7217

Corley 30" Special Carriage, double bit hammer three head blocks, automatic sawmill, excellent shape.

Contact: Harris Lumber Co.
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$3,000 or best offer. Cut Off Saw, Air Driven, 20" Carbon Tip Blade. 12' on and off feed.

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or 314-422-3687
Leave Message

Schutte Hammer Hog, Model H2F40, 100 HP, built in blower.

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Sentinel Industries Inc.
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Grade Lumber, green, 5/4 and 6/4 red oak.

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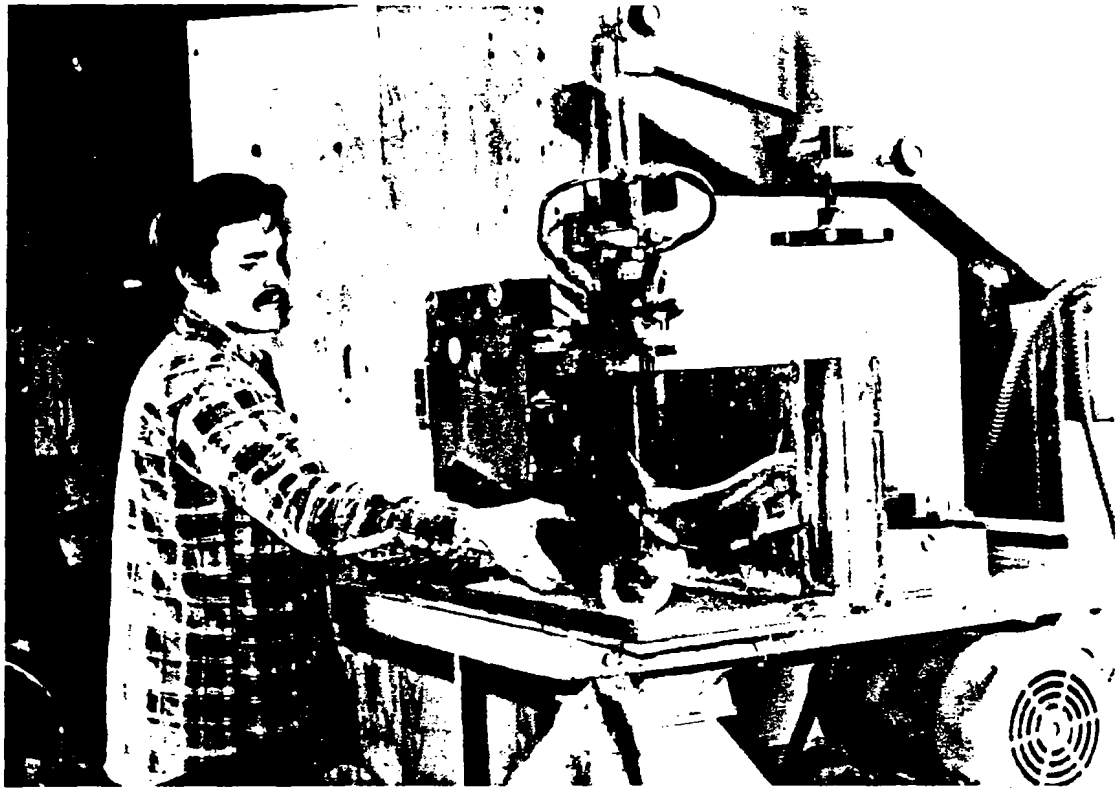


The Micro-Saw Mill converts your bandsaw into a sawmill for irregular pieces.

... makes possible the harvesting of California Chaparral for beautiful wood.

Californians like to get away from the crowds and build their homes or cabins in the mountains, preferably with a view.

This is also where brush species such as Manzanita, White Thorne and Madrone grow in abundance. The Indians burned it and the Spaniard called it Chaparral. We have bulldozed it, sprayed it and control-burned it to provide access and reduce fire hazard.

From time to time people have cut it into small boards for picture frames, jewelry cases and handles, but, until now, it hasn't been available for sale.

The reasons are simple. Chaparral grows crooked. It is very hard and, unless carefully handled, it warps and cracks when it dries. It is expensive to cut and transport. Parts that are not suitable for turning into boards or blocks must be disposed of or an even greater fire hazard exists.

EBC Company, in Willits, California has succeeded in solving most of the problems and is working on the rest.

The wood suitable for boards is cut into 21" inch lengths and brought, within a matter of hours, to the Micro-Saw Mill. There it is cut into pieces 1/2 to 1 1/2 thickness. The Micro-Saw Mill can handle logs and pieces up to 14" inches in diameter, depending on the capacity of your band saw.

The Micro-Saw Mill is all in one assembly. It slides on, and is bolted to, your existing table.

The operator places the piece against the back-stop, then presses the clamp button, which clamps the piece by using compressed air. Next, two buttons are pressed simultaneously causing the air cylinder to advance the piece through the cut. The return is automatic. At the end of the return stroke the clamps open and the piece falls out. The sequence is repeated. (In general, each sequence lasts about 90 seconds.) Because of the unique design, pieces with a crook, in one direction only, can still be cut. This produces pieces with beautiful grain and character, also allowing the craftsman to combine lighter and darker woods for contrast. Manzanita and (the lighter) Madrone work very well for beautiful and unique gift boxes.

species live to only about sixty years. There are exceptions but, as a rule, brush should be harvested every thirty years to reduce the fire hazard that threatens our homes and lives. Deer and other wildlife cannot get through, or find, grazing in old dense growth. Removing or thinning the brush and utilizing it, by producing saleable products or charcoal, ties up the carbon. This reduces the buildup of carbon dioxide in the atmosphere, which is the cause of the "Greenhouse Effect."

This bit of research and development will, we hope, prove again Barry Commoner's statement, "Waste and pollution are resources but of place." As craftsmen make beautiful things out of Chaparral the cost of fire protection goes down.

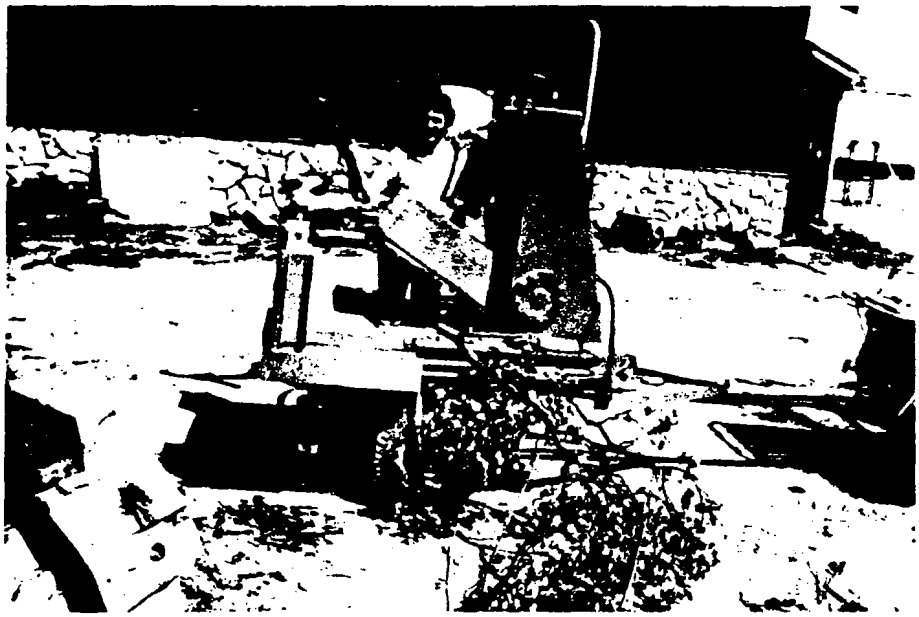
In short, why not enjoy something crafted from Manzanita, rather than watch it burn below your home on a hot summer day.

Ed Burton

E B C Company
222 Franklin Avenue
Willits, California 95490
Phone (707) 459-6219

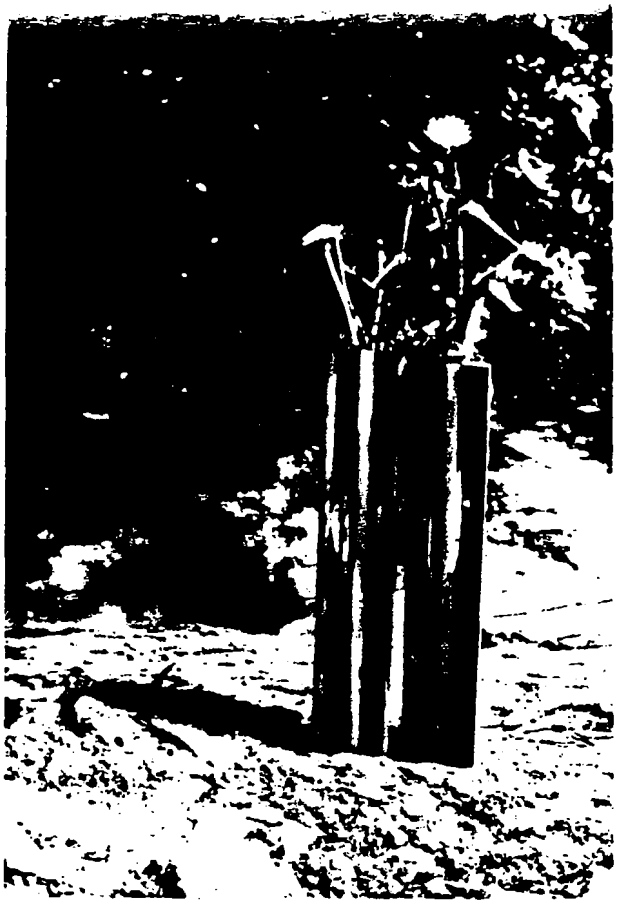
Manzanita and other chaparral species mature in about thirty years. Many become over-mature and die in about 60-80 years, particularly in dense stands. The ideal management would remove eighty percent of the stand leaving selected stems at about 10-15 foot spacing. In many cases these would be pine and fir.

Master craftsman Dick Roble created this set. The hardness and rich color make manzanita unique.

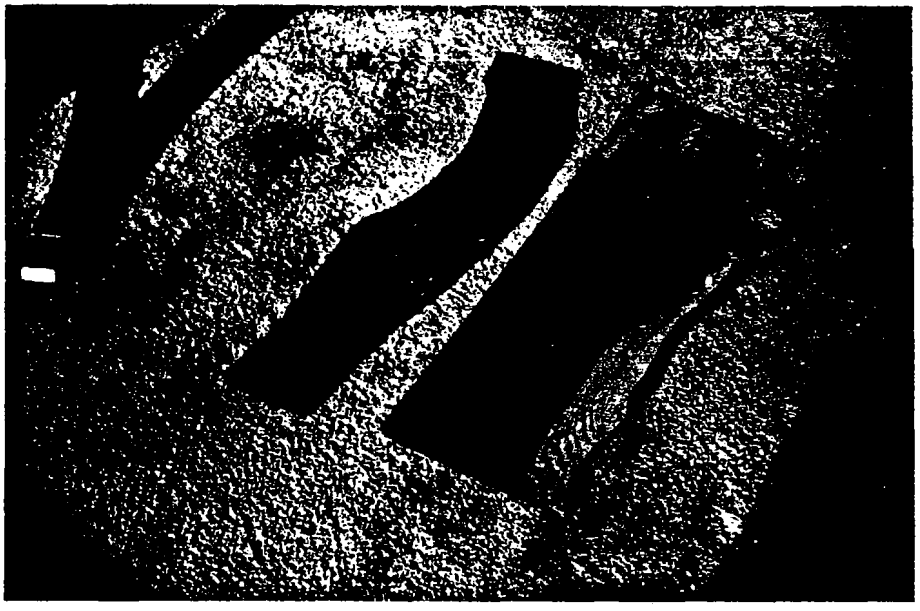


The manzanita is sheared into 21 inch lengths for barbeque, firewood or for processing into charcoal. The fine grain hard wood makes superior charcoal for filtration.

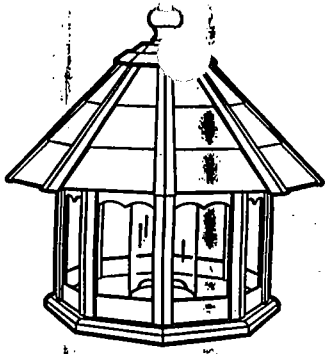
This is the sheared branches before bundling. Pieces over four inches diameter are cut with a saw for processing into boards.



Manzanita and tanoak are combined to create these unique bud vases. They even make dandelions look attractive.



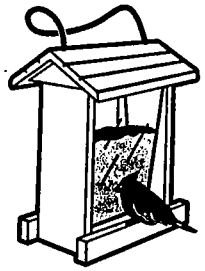
Specialty redwood and manzanita boards cut on the Micro-Saw Mill.



Gazebo

Deluxe Bird Feeder – Model GZ

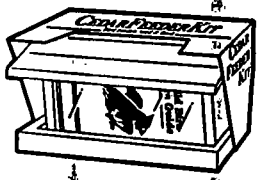
- Pole-mount design
- Easy-fill lift off roof
- 8 sided gazebo style
- Easy-clean large feeding area
- 8 lb. seed capacity



Cedar Bird Feeder

Model PF6

- Rugged poly rope for hanging
- Easy-fill lift off roof
- Value priced
- 2.5 lb. seed capacity



CedarFeeder Kit

Model EFBS

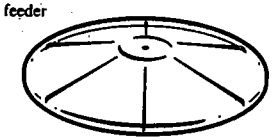
Complete, All-In-One Kit Includes:

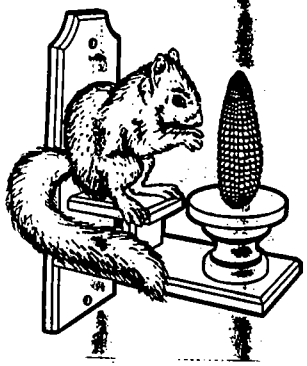
- CedarFeeder bird feeder
- Wild Bird Care Guide
- Starter bag bird seed

Squirrel Guard

Model SG12

- Helps keep squirrels from bird feeder
- Fits Cedar Works QuikPole
- 13" clear plastic disk





Deluxe Squirrel Feeder

Model SFT

- Decorative feeding table
- Threaded corn holder
- Predrilled mounting holes

A Word About Our Product

Our Country Home products are carefully crafted from one of nature's most remarkable woods, the Aromatic Red Cedar. In addition to its beautiful color and rich aroma, it is also naturally weather resistant. Its own preservatives will protect it for years to come; no chemicals are necessary. Being a natural material, Aromatic Red Cedar is a sound ecological choice, preferable to others that are non-biodegradable. Found flourishing in the Appalachian and Ozark Mountain regions of the United States, it is not an endangered species; reforestation occurs naturally and out-paces harvesting. This makes possible our commitment to provide quality products that pose no threat to the environment.

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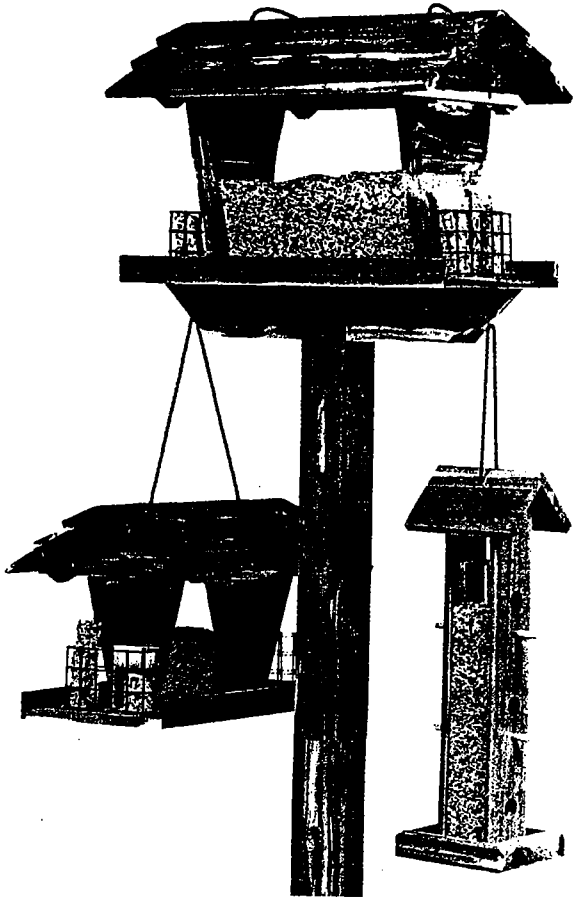
from Cedar Works

Wild Bird Care Products

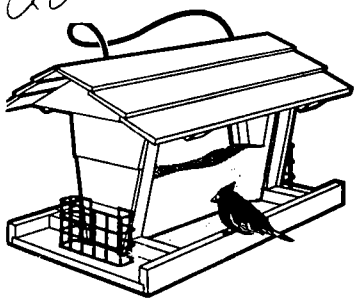


COUNTRY HOME
from Cedar Works

Wild Bird Care Products

- Premium Aromatic Red Cedar
- Naturally Weather Resistant
- Environmentally Sound

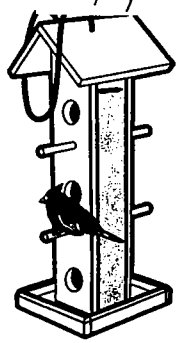
28.43



CedarChalet Plus

Large Capacity Bird Feeder – Model DF
- Rugged poly rope for hanging
- Easy-fill hinged roof
- Suet feeders on each end
- Predrilled for post mounting
- Extra large 14 lb. seed capacity

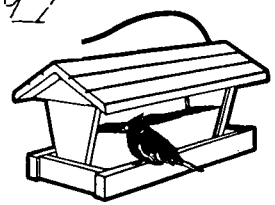
$14.97



CedarTower

Bird Feeder – Model TF
- Rugged poly rope for hanging
- Easy-fill lift off roof
- Durable hardwood perches
- Ideal for small birds
- 2 lb. seed capacity

7.97



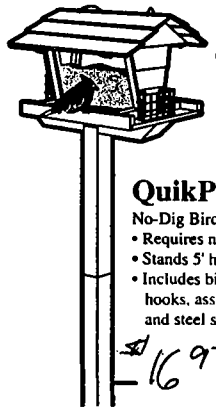
CedarFeeder

Bird Feeder – Model EF6
- Rugged poly rope for hanging
- Easy-fill lift off roof
- Ideal starter feeder
- 3 lb. seed capacity

$22.63

CedarChalet

Bird Feeder – Model CF
- Rugged poly rope for hanging
- Easy-fill hinged roof
- Suet feeders on each end
- Predrilled for post mounting
- Large 7 lb. seed capacity



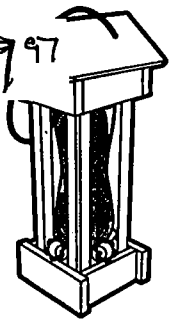
(Bird feeder purchased separately)

QuikPole

No-Dig Bird Feeder Post – Model FP
- Requires no digging or concrete
- Stands 5' high
- Includes bird feeder hanging hooks, assembly hardware and steel support stake

$16.97

$9.97



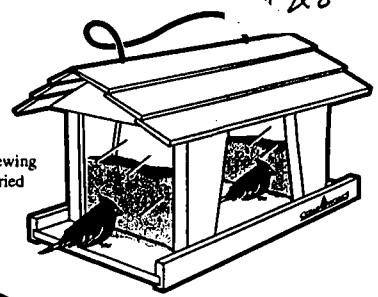
Hummingbird Feeder

Model HF6
- Rugged poly rope for hanging
- Easy-fill lift off roof
- Plastic nectar bottle
- Four feeding stations

$28.43

CedarBridge

Bird Feeder – Model B117
- Rugged poly rope for hanging
- Easy-fill hinged roof
- Large 7 lb. seed capacity
- Fly-thru design for optimum viewing
- 2 feeding chambers – allows varied feed & greater access



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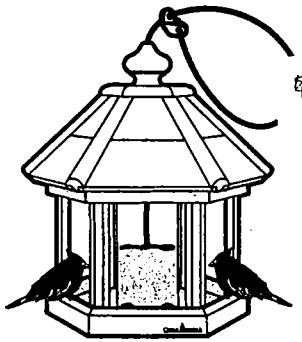
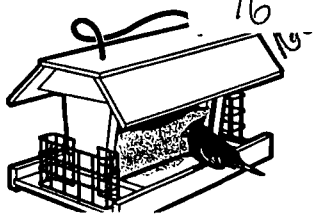


CedarGazebo

Bird Feeder – Model B118
- Rugged poly rope for hanging
- Hang or pole-mount design
- Easy- fill lift off roof
- 6 sided gazebo style
- 3 lb. seed capacity

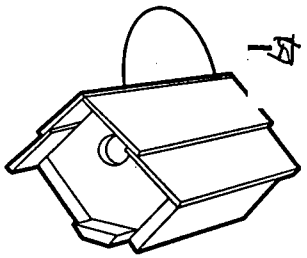
$16.88



CedarRanch

Bird Feeder – Model B116
- Rugged poly rope for hanging
- Easy-fill lift off roof
- Suet feeders on each end
- 4 lb. seed capacity

$8.47



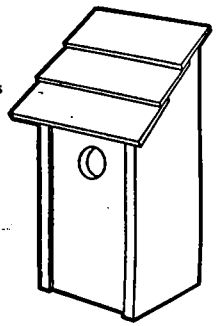
CedarHouse

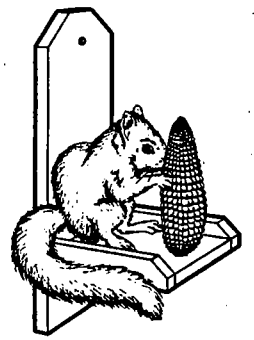
Bird House – Model WH6
- Ideal for wrens and other small birds
- Rugged galvanized wire for hanging
- Removable bottom for easy clean-out
- Naturally repels parasites

CedarNest

Bird House – Model BH4
- Ideal for bluebirds and cavity-nesting birds
- Predrilled mounting holes – includes screws
- Hinged front for easy clean-out
- Built-in ladder helps young leave nest
- Naturally repels parasites

$9.97





Squirrel Feeder

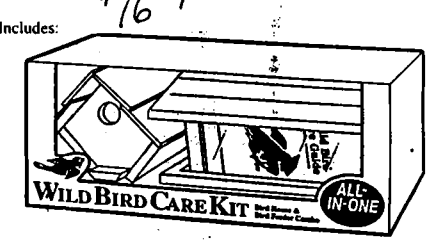
Model SF6
- Predrilled mounting holes
- Threaded spike holds corn securely

$4.97

Wild Bird Care Kit

$16.47

Model EFWH
Complete, All-In-One Kit Includes:
- CedarHouse bird house
- CedarFeeder bird feeder
- Wild Bird Care Guide
- Starter bag bird seed



$16.47

Hummingbird Care Kit

Model HFCK
Complete, All-In-One Kit Includes:
- Hummingbird feeder
- Hummingbird nectar
- Hummingbird Care Guide

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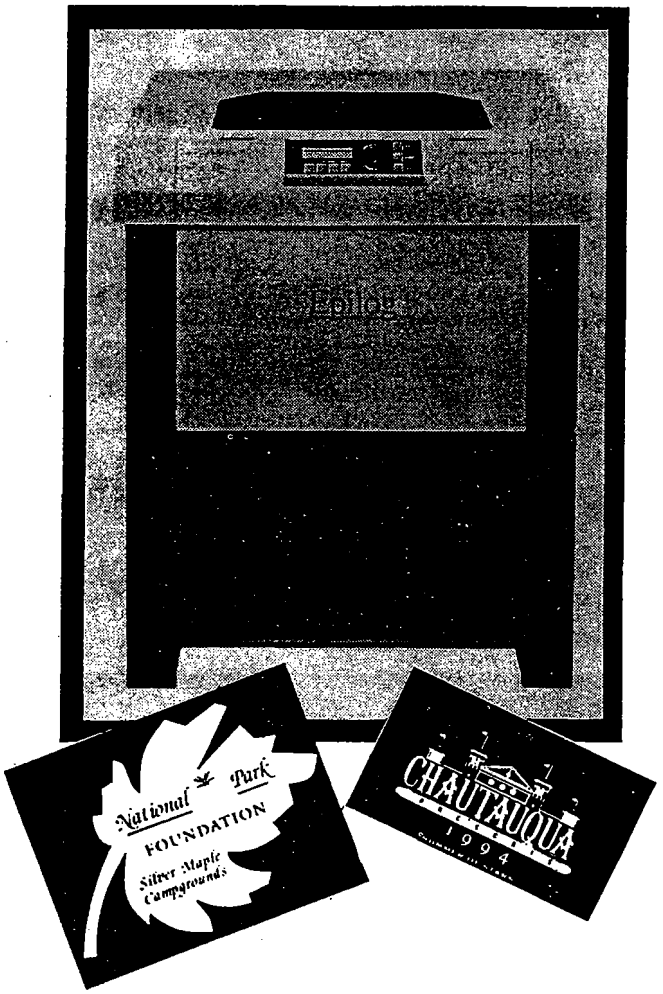

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OPERATING MODES:	Raster Engraving Vector Cutting Rubber Stamp

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EPILOG CORPORATION - 400 CORPORATE CIRCLE - SUITE M - GOLDEN, CO 80401

Engraving Area

The enormous 22 x 17 inch usable engraving area is at least twice as large as most laser engravers. This entire area is available for you to engrave in a single pass. Huge control panels or enormous perpetual plaques can be engraved with one pass, one setup - no problem. Even larger pieces up to 26 x 20 inches will easily fit into the cabinet.

Motor Driven Focus Control

Engrave material up to 7.5 inches thick on the motorized engraving table. The engraving table is motor driven so that you can quickly and easily move the table up or down to focus on any object up to 7.5 inches thick. Pinpoint focus accuracy is assured with our micro-fine step size. Not only is this the easiest and most practical way to to focus, but it's also the most fun!

Cabinet Access

The Summit laser engraver provides you with a VERY large access door making it easy to place large or bulky items into the cavernous engraving cabinet. Once the item to be engraved is in the cabinet, simply position it against the upper left corner stops and you are ready to focus. There is no need to clamp or hold your work piece in place because the table is stationary while engraving, with only the laser beam moving across the work surface. An expansive window allows to view the entire engraving area.

Control Panel

The Summit's front control panel is so easy to understand and operate, that you can become an expert operator in no time at all. Designed for ease of use, all modes and settings are constantly displayed to keep you informed about the machines status. Changes can be made at anytime simply by pressing the appropriate button and turning the control knob; your changes will be displayed as you make them.

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Resolution

SUMMIT EX	SUMMIT LX
600 DPI	300 DPI

The level of detail that can be produced with Epilog's true 600 DPI resolution has to be seen to be appreciated. Epilog's 600 DPI resolution gives you the smoothest curves and most precise laser engraving on the market. Engraving the finest text or delicate logo on coated metals is now achievable with a clarity your customers will find truly amazing.

Speed

Speed settings are fully adjustable in 1% increments from 1 to 100%. This gives you the flexibility to find the perfect speed setting for each of your different engraving materials. Set the speed either before starting a job or, if you need to experiment, change the speed while engraving to find the ideal speed. Use higher speeds for surface etching, or use slower speeds for deep cutting.

Engraving time, although related to speed, does however involve more than just setting the speed on the control panel. When you compare the engraving speed of one machine to another you need to compare things like processing time, pause time between lines, and horizontal and vertical optimization. With the Summit series, Epilog has used state-of-the-art electronics and mechanics to reduce waiting time to an absolute minimum in all of these categories. No other 25 watt laser engraver comes close to starting and finishing a job as quickly as the Epilog Summit series. Do a one for one comparison with other engraving systems to find out what engraving speed really means.

Power

Power settings are also adjustable in 1% increments from 0 to 100%. The variable power settings offer you the flexibility to find the ideal settings for your different materials.

As with speed, power also involves more than just dialing in the desired setting. The Summit EX gives you the advantage of true 600 DPI resolution optics that are able to pack more energy into a smaller spot size. Epilog's use of high-tech optics and advanced motion control technology results in faster production, greater depth of cut and higher quality images than could previously be achieved with a 25 watt laser engraver.

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You are probably aware of the excitement that laser engraving has generated over the last couple of years in the awards and recognition industry. But, you may be wondering if laser engraving is right for your business?

Consider some of the powerful advantages that laser engraving provides for your business.

Ease of Use

The laser is as easy to use as the laser printer you currently have connected to your computer. If you are using a graphics program such as CorelDRAW to do sublimation or screen printing, the laser engraver is the perfect complement for your existing business. Just connect your laser to your computer and you're ready to start engraving.

If, on the other hand, you are just getting started in the graphics field, rest assured that CorelDRAW and other graphics packages are widely used throughout the engraving industry and that there are many support activities to help you learn.

Versatility

Laser engravers are probably the most versatile engraving machines available today. The broad range of materials and shapes that you can engrave with a laser make it uniquely adaptable to virtually any of your customers needs. From paper to glass, from wood to coated metals the laser is perfectly suited to virtually all of your engraving requirements. Ask us about the materials you would like to see engraved - we will engrave them for you.

Speed

By far, one of the biggest advantages of laser engraving is the speed that you can engrave. Engraving time on materials such as acrylic, plastic or coated metals is typically a small fraction of that required by mechanical engravers. Compare the time it takes to scan vs. the time it takes to digitize even a simple logo and the time difference becomes enormous. From the simplest to the most complex, the laser is easily able to engrave virtually any artwork with speed and precision that until recently was unavailable.

Scanning & Graphics

The ability to scan and reproduce high quality personalized products is at the heart of today's awards and engraving industry. Scanning a detailed logo or your customers custom artwork is as easy as making a copy on your office photocopier except the scanned results are much better. The detail and accuracy you can achieve with a high resolution scanner are truly incredible. Have us scan your business card to see how quickly and how precisely we can engrave a near perfect duplicate.

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Epilog *SUMMIT EX* High Resolution Laser Engraver $19,900

INCLUDES:
Raster Engraving
Vector Engraving
Variable Resolution to 600 DPI
High Resolution Lens
16 MB RAM Standard
Rubber Stamp Software

OPTIONS:

Rotary Glass Attachment	$ 995
Self Contained External Exhaust	$ 400

Recommended Computer System - NOT Included with Engraver

* 486 Microprocessor - 66MHz, 50MHz or 33MHz
* 8 To 16 Mb RAM
* 400 Mb Hard Drive
* VGA or SVGA Monitor
* Double Spin CD Rom Drive
* 1.44MB 3.5" and 1.2MB 5.25 " Floppy Drives
* DOS
* Windows 3.1
* CorelDRAW! 3.0
* Mouse

* NOTE - IBM or IBM compatable computer systems working in the Windows environment will work with our laser engraver.

Scanner - Epilog recommends the Hewlett Packard Scanjet IICX scanner. There are, however, a number of good scanners on the market that are suitable for this application. 400 Dot Per Inch(DPI) minimum resolution is recommended.

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We believe that laser engraving equipment will become a necessity for most engravers over the next few years. Not as a replacement for rotary engraving equipment, but as a complement to it. If your shop is already equipped with computerized engraving equipment, the laser engraver can add a new dimension to what you are currently doing. The number of products that are specifically designed for laser engraving is constantly growing. The fact that you can take virtually any artwork and laser engrave it onto a vast array of products and materials of numerous sizes and shapes is amazing. The fact that you can also do this with unsurpassed clarity and speed is no less exciting.

We have tried to be honest in our portrayal of what our laser engravers can and cannot do. If you have questions please ask us. We always try to answer by letting the engraver speak for itself. We want you to see for yourself. Challenge us. Compare our laser engraver to other machines you are considering. See if you like the look of the finished product. Compare engraving speeds, setup times, engraving quality. See if it is as easy as we say it is. Compare price. See how affordable lasers have become to own and operate.

Then decide if laser engraving is for you. We hope that it is!

Thank you,

The Epilog Corporation

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MAXIMUM ENGRAVING AREA:	22 X 17 INCHES
MAXIMUM WORKPIECE THICKNESS:	7.5 INCHES
MEMORY BUFFER:	16 MB STANDARD
LASER:	HORIZONTALLY MOUNTED 25 WATT AIR COOLED CO2
VENTING:	EXTERNAL VENTILATION TO THE OUTSIDE IS REQUIRED
ELECTRICAL:	110 VOLT AC / 15 AMPS
DIMENSIONS:	33"W x 28"D x 21"H
WEIGHT:	150 POUNDS UNCRATED 200 POUNDS SHIPPING WEIGHT
SAFETY:	CDRH CLASS 1 ENCLOSURE
INTERFACE:	PARALLEL PRINTER PORT (LPT) WITH WINDOWS 3.1
OPTIONS:	ROTARY GLASS ATTACHMENT SELF CONTAINED EXTERNAL EXHAUST

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Warranty

Epilog has a singular policy towards service. We offer a two year warranty. If your machine breaks, we will fix it - no questions asked. We strive to have you back up and running in less than 24 hours at no expense to you.

This warranty does not require you to purchase a separate service contract. Compare our free service to what it typically costs you for required service contracts when purchasing traditional engraving equipment. You will see a savings of well over a thousand dollars per year in maintenance costs.

Epilog is able to provide this kind of service because we designed and built the Summit to hold up under the most demanding conditions. Look inside the cabinet and you will see that every part was built to last a lifetime. By keeping your laser engraver clean and lubricated you will have many years of trouble free engraving.

Training

Epilog representatives normally spend one day at your facility for installation and training. We also have a technical representative available by phone to answer any questions you may have about any aspect of the laser engraver. Please feel free to call us at any time with comments, suggestions, tips for engraving, etc. We enjoy hearing from you.

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The Cedar That Isn't

continued from page 58

slow-growing tree. The foliage on the new cedar is sharp and lance-shaped. The new foliage on older trees is also lance-shaped, but the mature foliage is more like that of a cypress: scale-like and pressed to the stem. Together the branchlets form flattened green sprays.

Often the most beautiful part of an old cedar is its bark. *Exfoliating* is the term horticulturists use to describe this kind of bark. It is extremely thin (which makes cedar particularly susceptible to fire) and peels off in long, vertical strips. The peeling bark gives redcedars a wonderfully hoary appearance, and the trunks themselves are often fluted like classical columns. A grove of old cedars with high limbs and exposed trunks is rare, but where it exists, the effect is beautiful.

Most observers consider redcedars slow-growing, and from a lumberman's standpoint they are, but on good soils their height gain can be relatively rapid. It takes a long time to grow a marketable cedar log, but not so long to get a good-sized tree. A neighbor of mine dug an 18-inch cedar out of a ditch bank and transplanted it to his yard. In seven years it was 18 feet tall.

The average cedar is 40 to 50 feet tall at maturity, although on good sites they've been known to reach 120 feet in height. Most of the largest and oldest redcedars in the United States are gone, but a few champions are still around. According to the American Forestry Association, the largest eastern redcedar in the country grows in Coffee County, Georgia, and is 17.5 feet in circumference and 55 feet in height. The oldest age reported for a cedar is 300 years.

Redcedar wood is highly valued for its fragrance, beauty, and longevity. It is the unmistakable red heartwood that is responsible for the "red" in the common name. The sapwood, equally stunning, is white. The wood's fragrance and reputed ability to repel moths makes it the wood of choice for closets, drawer linings, and hope chests. Lucky pets sleep on mattresses stuffed with cedar chips.

At one time the most intensive use of the wood was for pencils. The oldest pencil manufacturer in the South, the