

The Market Place

Timber • Products • Equipment • Services

Winter 2011

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A service to Minnesota forestry industry.

Revitalizing Old Ways With Wood: Heat Treatment Expands Uses of Regional Hard and Soft Woods

By June Kallestad,
Natural Resources Research Institute

As far back as 900 B.C., the Vikings of Norway kept fence posts from rotting by burning the surface of the wood. They figured out long ago that this process makes the wood more durable in harsh elements. The best ideas, it seems, stand the test of time.

New technology

The Natural Resources Research Institute (NRRI) at the University of Minnesota Duluth is bringing that Scandinavian technique to the Midwest to benefit the regional window and door industry. Thermal modification makes any wood – aspen, red pine, birch – more stable, durable, and rot resistant. This could open up new uses for local wood supplies.

Extensive research over the past 15-plus years on thermally-modified wood was conducted by VTT Technical Research Centre and the Institute of Environmental Technology, both of Finland, resulting in a commercial-scale process called ThermoWood®. The wood is basically baked in a three-step process in high heat ovens (up to 419° F), altering the mechanical, physical, and chemical properties of the wood. Today, there are a number of manufacturers who make the ovens, with different processes.

NRRI received a grant from the USDA Forest Service's Wood

Education Resource Center to fund research focused on establishing thermally-modified wood use in Minnesota to benefit forest products industries.

"I think this is a really great technology strategy to utilize more regional woods," said Pat Donahue, director of NRRI's Market Oriented Wood Technology program. "We can use hardwoods or softwoods, and there's a lot of potential in ash because of the wood available from the emerald ash borer infestation."

Start-ups

Pat is helping two businesses get started with this technology. Wolf Wood, Inc. in Spooner, Wisconsin, is going to treat the wood and make door and window components. It is currently gearing up for the pilot project after being awarded a grant last August. Superior ThermoWood® of Brainerd, Inc. in Palisade, Minnesota, will make thermally modified lumber for a variety of uses. It will be one of the first of its kind in the nation to use heat rather than chemicals to treat wood. A Finnish-made heat treatment kiln has been installed at the sawmill.

Research needs

Mechanical and physical testing of the modified wood in NRRI's labs is underway with just the biological degradation testing yet to go. Since there are no scientific protocol

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WOOD MARKET OUTLOOK: 2011

By Don Deckard, Forest Economist

Tally of the “Great” Recession

The Wall Street triggered national financial crisis and ensuing recession took its toll on Minnesota’s forest products industry. We lost four large manufacturing plants and many small sawmills with a cumulative loss of more than 1,500 jobs, \$430 million in industrial output, \$200 million in value-added, and \$14 million in state and local tax payments.

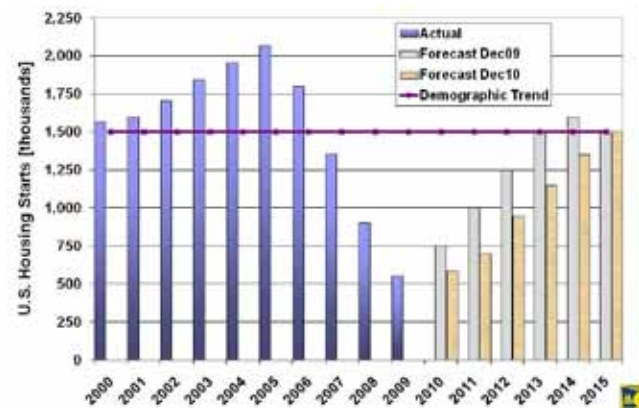
Statewide, timber harvest volume on all ownerships declined from 3.7 million cords in 2005 to about 3 million cords in 2010. However, the state’s forest economy as a whole weathered this economic “perfect storm,” partly due to our world-class paper industry, a diverse wood products manufacturing base, availability of competitively priced wood fiber from the forest land base, and increasing demands for renewable energy.

Recovery and Rebalancing

In Minnesota, the growth of wood fiber is significantly higher than the combination of harvest and mortality losses. The state’s current industrial wood surplus facilitates opportunities to expand wood-using industries, create jobs, and support our quality of life through tax-funded public services. A recent Department of Natural Resources analysis concluded there is potential for sustainable harvest levels exceeding 5 million cords per year from all ownerships.

Housing related wood products:

The year 2010 closed below expectations with 600,000 starts. Foreclosure rates reached record high levels and net household formations brushed record low levels. The current forecast is for housing starts to slowly gain momentum and top 1 million by 2013.



Another promising indicator of improving market conditions is Chinese imports of U.S. logs and structural panels accelerated in 2010. The creation of a Chinese middle class and changes in Chinese building codes increased wood frame residential construction.

In 2007, the U.S. exported less than 100,000 cubic meters of wood, compared to an estimated 2.4 million cubic meters in 2010. The U.S. is now the third largest softwood log supplier to China, after Russia and New Zealand. The outlook for Minnesota’s battered sawmills, structural panel manufacturers, and other housing market dependent sectors are slowly improving.

Printing and Writing Papers:

Minnesota’s pulp and paper industry is dominated by the manufacture of printing and writing paper and is impacted by global capacity and market prices. Primary competitors for the U.S. market share are China and Brazil. Pulp and paper demand and pricing were less impacted by the recession than housing related wood products. The demand slowed for about 12 months then rebounded. In fact, market pulp prices reached record high levels in 2010.

The outlook for printing and writing papers in North America is flat to slightly positive, but is conditional on anti-dumping tariffs for heavily subsidized Chinese imports and previously announced reductions in European capacity. The Upper Midwest is a hub of printing and publishing activity that requires a steady supply of quality paper.

Renewable Energy:

Wood-based renewable energy has important economic, climate change, and national security benefits. If the federal renewable fuels standard and the state’s renewable energy portfolio standards are met, wood fiber use for renewable energy is forecast to increase from five percent to 40 percent of total industrial wood fiber consumption by 2025.

Note: This article contains forward-looking statements that reflect the author’s view and are subject to risks and uncertainties that could cause actual outcomes to differ substantially from those expressed or implied.

standards for thermally-modified wood, the researchers are using industry standards for wood/plastic composite, the next closest thing.

“We’re getting a lot of good data so that we can understand the mechanical properties of this wood as it relates to applications in the window and door industry. That was our goal,” said Pat.

NRRI is also partnering with Dr. Mathew Leitch, a wood products professor at Lakehead University in Ontario, Canada, to develop a North American Thermally Modified Wood Standard Protocol. The two researchers are each seeking funding from their respective countries to move this forward.

“With different manufacturers making the ovens, and different processes and ‘recipes’ for using the wood for different purposes... it’s not well-documented what that means for the manufacturer or its end-use,” Donahue said. “We’re trying to address that need.”

Process and results

As reported on the Superior Thermowood ® of Brainerd, Inc. website, “The state-of-the-art kiln circulates intense heat and steam within a controlled environment to ‘dry’ wood. Each tree species is exposed to its own time and temperature formula depending on the qualities or end results desired. As temperatures rise in the kiln, excess moisture, naturally occurring sugars, and resins are drawn out of the wood. This results in a hardened surface quality, a stabilized internal cell structure, and a natural barrier to moisture.”

PROCESS FOR THERMALLY MODIFYING WOOD:

Phase 1:

The wood is put into a kiln where both heat and steam raise the temperature quickly to about 100°C [212°F]. The temperature is then increased steadily to 130°C [266°F] while the high-temperature drying takes place and the moisture in the wood decreases to nearly zero.

Phase 2:

After the high-temperature drying,

the kiln temperature is increased to between 185°C–215°C [365°F–419°F]. When the target temperature has been reached based on the wood type, the wood is baked for two to three hours depending on the wood’s end-use.

Phase 3:

In the final stage, the temperature is lowered using water spray until the temperature is between 80°C–90°C [176°F–194°F] and the moisture level of the wood is brought back to four to seven percent.

The heat treatment process gives the wood a rich, dark color that can eliminate the need for staining lighter colored woods. Because chemicals are not used to make it more durable and rot resistant, it is environmentally beneficial. The process eliminates the hemicellulose, or sugars, where decay gets its foothold in wood. When the lignin in the cellulose wall is softened and then repolymerizes, water’s ability to affect the wood is greatly reduced. The wood becomes lighter in weight and the thermal insulation properties are improved. However, the rigidity and strength properties are also diminished.

“For windows and doors, this could be an excellent wood source,” said Pat. In Finland and elsewhere in Europe, the process has been used for 10 years, resulting in decking, siding, and trim applications. It is also a popular component in sauna construction where heat and moisture often interact.

What is really exciting is this method could be considered “green,” a benefit to manufacturers and their customers looking for products made without chemicals. In addition, the increase in dimensional stability is a true bonus in this part of the country, where weather extremes are common. Wood flooring, cabinets, and other solid wood end-use products shrink from 30 to 50 percent less than lumber dried in lower heat kilns.

With its many benefits, this process may be the wave of the future.



Thermally heat treated wood used in a window frame.

Emerald Ash Borer:

On The Learning Curve

By Paul Ahlen, Molly McGilp, and Liz Erickson;
Plant Protection Division, Minnesota Department of
Agriculture (MDA)

We never thought of Minnesota as an ash-receiving hub. As it turns out, the more inspections we do, the more surprises we find regarding how far wood has traveled to reach Minnesota, a state with a rich forest resource of its own. Time and time again, we find it remarkable to discover wood in all forms crossing the Minnesota state line to be sold to Minnesota landscapers, carpenters, and campers.

Investigations

Humans have commonly spread emerald ash borer (EAB) by moving infested ash (*Fraxinus* spp.) material. The Minnesota Department of Agriculture is the agency tasked with regulating articles that could spread emerald ash borer. Regulated articles include: ash logs, lumber, slash, chips, and nursery stock in addition to all hardwood firewood.

Firewood is an especially high-risk product known to spread EAB elsewhere in the country. In the last year, firewood inspections in Minnesota have documented bundles from as far away as Pennsylvania, Kentucky, Missouri, Iowa, Wisconsin, Texas, and New Mexico. Firewood bundles were also discovered from the country of Estonia.

The discovery of this importation by MDA's regulatory staff is significant for two reasons:

1. Five of the previously listed states currently have EAB within their borders. This means there is always the chance a new infestation could pop-up in an unexpected location due to an export from a known-infested state.
2. Minnesota has one of the highest population of ash trees in the United States, yet we are receiving imports from other states and even other countries. Had our regulatory staff not been monitoring firewood in Minnesota, this loss of local wood utilization would probably have gone unnoticed.

Within Minnesota, the Plant Protection Division's regulatory staff routinely follows up on potential avenues of EAB movement and possible EAB quarantine

violation and related firewood statutes. Some of the broader investigations include:

- Mulch from Michigan, properly treated to mitigate the risk of spreading EAB and with the United States Department of Agriculture certification, was found during a joint inspection at a commercial vehicle weigh station.
- Ash lumber from Minnesota, properly treated to mitigate the risk of spreading EAB and with federal certification, is being shipped occasionally to Wisconsin and Iowa.
- Several tree care companies have been found hauling ash tree waste to dump sites outside of the quarantine.
- Several companies have been found misusing government certificates and misrepresenting their certification status.

Lessons Learned

The lessons we have learned while regulating for EAB involve both the policies in place and the people who must abide by EAB regulations.

- Firewood laws and the level of enforcement vary considerably from state to state, and even vary within Minnesota. Some areas of industry, like pallet manufacturers and sawmills no longer accept ash in their manufacturing process rather than deal with increased government regulation.
- The businesses that treat regulated material claim to be greatly benefiting from selling regulated material (i.e. *Fraxinus* spp. logs, brush, chips) that otherwise could not be legally removed from the quarantine.
- Members of the tree care industry and firewood industry have expressed interest in a government licensing or certification program. Many government agencies and various private industries have been very helpful in reducing the risk of spreading EAB to areas outside of the quarantine.

“Firewood inspections in Minnesota have documented (ash) bundles from as far away as.....the country of Estonia.”

- Private companies from all industries affected by the EAB quarantine have been very helpful assisting MDA in response to possible violations.

- Communication between private industry and EAB regulation enforcement staff has been very positive, allowing regulatory staff to pass along information on Asian longhorned beetle, thousand cankers disease, gypsy moth, Minnesota's Tree Care Registry, etc.
- MDA has also had very successful cooperation with the Department of Public Safety Commercial Vehicle Inspectors in implementing a series of inspections at three of its weigh stations within the past year.

the tree the adult initially emerges. Clearly EAB did not arrive in Minnesota by flying here on its own; it arrived with human assistance. The nearest infestation to the Twin Cities EAB finding is in Houston County, over 100 miles away. If, for example, EAB is discovered north of Duluth within the next 10 years, it is because humans brought it there.

The best thing we can do to protect our forests is to not move ash material or non-certified firewood outside of infested communities.

For more information, go to the EAB website at: <http://www.mda.state.mn.us/eab>.

The Big Picture

On its own, EAB travels a half mile to a mile away from

Softwood Sawtimber Analysis

By Keith Jacobson, Utilization and Marketing

The softwood-using industry plays a vital role in the management of forest resources, which provides multiple benefits. Yet, supplies of softwood material for several of the state's large sawmills have been critically low over the past two winters. This was due primarily to the combined effects of recessionary low lumber prices and an overall decline in harvest levels across all ownerships statewide.

In response, the Department of Natural Resources (DNR) accelerated management work for some softwood resources and committed to performing an analysis of the softwood industry and resources. While the DNR cannot resolve a softwood sawtimber material shortage on its own, as one of the major forest land managers in the state and a leader in forest management, it is important that the DNR continue to assess ways to help address the issue.

Softwoods consist of coniferous tree species, which in Minnesota include balsam fir, black and white spruce, jack, white, and red pine, and several others. These forest types provide habitat and biological diversity and several species provide economic benefits due to their high demand as forest products.

The analysis, which included information on all ownerships, especially focused on DNR-administered lands. It was prepared to inform decision-makers and key stakeholders about two issues. The first concerned the condition of important softwood resources and the estimated sustainable timber volumes offered under current management plans, policies, and practices. The second looked at several management opportunities

and alternatives with the potential to improve forest health and productivity, maintain sustainable yields, and stabilize forest industry health and DNR revenues.

The analysis report on the softwood sawtimber resource and forest industry has been posted at: <http://www.dnr.state.mn.us/forestry/um/index.html>. The alternatives and opportunities listed are tools for decision-makers when considering future actions. None of the options should be viewed as a recommendation by the task group. Some require further investigation, and in the case of DNR lands, interdisciplinary discussions, prior to any action being taken.

For more information, contact:

- General questions:
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- Forest biometrics and harvest modeling: Curtis VanderSchaaf; curtis.vanderschaaf@state.mn.us



If you wish to list an ad in the spring issue of the MarketPlace Bulletin, please fill out and return this form by April 15, 2011. There is no cost for placing the ad.

Forest Products:	Wanted ___	For Sale ___			
Equipment:	Wanted ___	For Sale ___			
Services/ Misc.:	Wanted ___	For Sale ___	Available ___	Services ___	Notice ___

(Examples of items to be listed include: stumpage, lumber, logging, sawmill and woodworking equipment, sawing, drying, marketing services, employment, or other forestry-related items.)

Name: _____ Company: _____
Address: _____ City: _____ State: _____ Zip code: _____
Phone: _____ Fax: _____
E-mail Address: _____

Please Note: Due to limited space all ads may not be printed in every issue. Please limit your ads to one page or less. Ads will not carry over from one issue to the next. Resubmit them for each issue.

Mail ads to: Mimi Barzen, DNR Forestry, 1201 East Hwy 2, Grand Rapids, MN 55744
Phone (218) 327-4119; Fax: (218) 327-4391
e-mail: mimi.barzen@state.mn.us

The Minnesota Department of Natural Resources reserves the right to edit all items included and accepts no responsibility for the accuracy of description or for the commercial integrity of the persons or firms making offers in this bulletin.



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e-mail: mimi.barzen@state.mn.us



For Sale: Forest Products and Equipment

FOR SALE: Cottonwood lumber; Contact: Loren Strei, 3835 121st Avenue, Ortonville, MN 56278; Phone: 320-839-2057

FOR SALE: Black walnut flooring, lumber, and firewood; delivery available in the Minneapolis area; Contact: Thomas Gosse, 511 2nd Street East, Wabasha, MN 55981; Phone: 651-565-4597

FOR SALE: 30,000 yards of slabs (most are softwoods) cut from pallet mill to grind into mulch; Contact: Dick Buhl of Root River Hardwoods, PO Box 624, Preston, MN 55965; Phone: 507-765-3867; Fax: 507-765-4575; e-mail: preston@rootriverhardwoods.com

FOR SALE: 1) 3,500 lineal feet of white pine 8"x8" cants, most 20 foot lengths; 2) 1,500 lineal feet of white pine lumber 2"x8" and 2"x10" all 20 foot lengths; 3) stickered elm lumber, air dried 2.5 years; Contact: Mitch Sheehan, 11093 Ridgeview Road, Hokah, MN 55941; Phone: 507-894-4621; e-mail: 1952tireman@acegroup.cc

FOR SALE: White cedar log faced landscape or building timbers, 5" and 6" thickness, 8 foot lengths; Contact: Duane Maki, 51101 County Road 29, Wirt, MN 56688; Phone: 218-659-2901; e-mail: makidm@paulbunyan.net

Equipment

FOR SALE: 1) New Simonds Trademark Gold bandsaw blades, 19'5"x4.5", 18 gauge, 1.75 T.S. left hand; 2) Used 26'1.5"x7", 17 gauge, 1.5 T.S. single cut bandsaw blades; 3) Slightly used FAS Trac bandsaw blade sharpener for 2.5" to 7" blades, Model 307, left hand; Contact: Harry R. Schell Sawmill Sales and Supplies, Inc., 601 West Park Street, Blue River, WI 53518; Phone: 1-800-462-5807

FOR SALE: Howell sawmill with two 46" blades, 110 HP diesel power unit. Sawmill is also available with building and 20 acres of timbered land near Lake Winnibigoshish. Contact: Duane Maki, 51101 County Road 29, Wirt, MN 56688; phone 218-659-2901; e-mail: makidm@paulbunyan.net

FOR SALE: 1) Used parts shipped daily for skidders, crawlers, loader backhoes, excavators, wheel loaders, and skid steers for Allis Chalmers, Athey, Bantam/Koehring, Bobcat, Case, Clark, Daewoo, Dresser, Drott, Fiat Allis, Franklin, Hitachi, Hough, Hyundai, International, John Deere, Kobelco, Komatsu, Leihberr, Link-belt, Michigan, Mitsubishi, New Holland, New Process, Pettibone, Samsung, Taylor, Timbco, Timberjack, TreeFarmer, VME, and Volvo; 2) Reconditioned engines and transmissions, dyno-tested; 3) Rebuilt winches, final drives, and used tires; Contact: Schaefer Enterprises of Wolf Lake, Inc., 4535 State Route 3 North, Wolf Lake, IL 62998; Phone: 618-833-5498 or 800-626-6046; Fax: 618-833-7765; e-mail: parts@sewlparts.com; web site: www.sewlparts.com

Services

SERVICES: Structural engineering, timber frame, and round log homes; difficult foundations; registered Minnesota professional engineer; Contact: John E. Wilkinson P.E., 604 2nd Avenue North, Sartell, MN 56377; Phone: 320-253-1019

SERVICES: Bandsaw and circular sawmill run daily, will cut logs to your specifications; Contact: Loren Strei, 3835 121st Avenue, Ortonville, MN 56278; Phone: 320-839-2057

The MarketPlace
 DNR Forestry
 500 Lafayette Road
 St Paul, MN 55155-4044



Change service requested

DNR Timber Auctions Spring/Summer 2011

Date	Auction	Area	Location
March 16	Regular/Intermediate	Backus sealed bid	Backus Area office
April 1	Regular	Lake City sealed bid	Lake City Area office
May 17	Regular	Park Rapids	Environmental Education Bldg
May 17	Intermediate	Park Rapids/Detroit Lakes	Environmental Education Bldg
May 18	Regular	Rochester	Rushford Fire Hall
June 1	Regular/Intermediate	Hibbing	Minnesota Discovery Center
June 1	Regular/Intermediate	Bemidji	Bagley office
June 7	Regular/Intermediate	Blackduck	Blackduck Senior Center
June 7	Regular/Intermediate	Orr/Tower	American Legion
June 8	Regular/Intermediate	Sandstone	Rutledge City Hall
June 8	Regular/Intermediate	Backus	Cass County Land Department
June 9	Regular/Intermediate	Cloquet	Carlton County Land Department
June 9	Regular/Intermediate	Baudette	Baudette Area office
June 14	Regular/Intermediate	Deer River	Big Fork Town Hall
June 14	Regular/Intermediate	Warroad	Warroad Area office
June 15	Regular/Intermediate	Littlefork	Littlefork Community Center