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One Gifford Pinchot Drive • Madison, WI 53726-2398 • Web site: www.fpl.fs.fed.us

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Contact: Gordie Blum, (608) 231-9325

E-mail: gblum@fs.fed.us

New process may help clean treated wood Naturally occurring fungi may reduce the volume of wood going to landfills

Madison, Wis.— Look around your home or yard and you'll probably find treated wood. Likely places are the kid's playground equipment, your deck or porch, or your picnic table. Treated wood is a four billion dollar a year industry, serving a very real need for the American consumer. By using treated wood, you prolong the life of wood and prevent more trees from being cut. Without treated wood, we most likely wouldn't be able to meet our increasing demand for timber, and our quality of life would suffer.

But recently the industry has come under fire. Concerns have been raised about some of the chemicals found in commonly used preservatives. The question is whether or not toxic chemicals and heavy metals can "leach" out of treated wood, posing a threat to the surrounding environment. Perhaps an even bigger question is how to safely dispose of all that treated wood after it has served its purpose.

Research being conducted at the USDA Forest Service Forest Products Laboratory (FPL) in Madison, Wisconsin, shows naturally occurring fungi can metabolize preservative-treated wood, turning the wood into nothing more harmful than carbon dioxide while breaking down or isolating toxic chemicals. The result could be a major step toward reducing the amount of preservative-treated wood going into our nation's landfills.

"So far we've only studied this process in a laboratory. The next step would be for someone to take this technology and conduct large-scale assessments," says Barbara Illman, research project leader at the FPL .

Illman, along with FPL researchers Vina Yang and Les Ferge, were recently awarded three patents for their work in using fungi to remediate wood treated with pentachlorophenol (PCP), alkaline copper quat

(ACQ), and creosote. They have also applied for a patent that uses the same process for copper chromated arsenate (CCA) treated wood.

For the past two decades, CCA has been by far the most commonly used wood preservative, but earlier this year the Environmental Protection Agency announced a voluntary ban on the use of CCA-treated wood for residential applications beginning in 2004.

"Even after the ban takes effect, there will still be a huge volume of CCA-treated wood in use for years to come," says Illman.

ACQ--a mixture of alkaline and copper compounds--is commonly sold as a replacement for CCA. But according to Stan Lebow, FPL research technologist, there may be some disposal issues down the road with ACQ since it uses three times as much copper as CCA.

"ACQ is marketed as a replacement for CCA since it doesn't contain arsenic. But it contains much more copper, which is a heavy metal and therefore poses some environmental concerns," says Lebow.

Pentachlorophenol and creosote are seldom used for residential applications, but are still commonly used commercially in products such as utility poles, railroad ties, bridge timbers, and marine pilings.

Most of the preservative-treated wood that comes out of service each year goes into our nation's landfills. Some other options do exist. PCP- and creosote-treated wood can be burned in cogeneration plants to produce electricity, but facilities for burning CCA-treated wood are both expensive and unpopular.

That's where Illman sees opportunity. "Our process is both inexpensive and environmentally benign," she says.

She adds that so far results have been the most promising for ACQ-treated wood. "We've been able to degrade about 30 percent of the ACQ-treated wood."

According to FPL statistics, almost 9 billion board feet of preservative-treated wood is used in this country each year. While not having exact figures on how much of that is ACQ treated, Illman says, "reducing whatever amount it is by 30 percent is a lot of wood that doesn't have to be landfilled."

So far the treatments for PCP and creosote have been less effective, but Illman remains optimistic. "Those results can change through further research. Remember, not much is understood about this process. Preservatives work well because the chemicals protect wood from most types of fungi. The fungi we use for remediation and degradation of waste wood are unique."

The USDA Forest Service Forest Products Laboratory was established in 1910 in Madison, Wis., with the mission to conserve and extend the country's wood resources. Today, FPL's research scientists work with academic and industrial researchers and other government agencies in exploring ways to promote healthy forests and clean water, and improve papermaking and recycling processes. Information is available at FPL's Web site: www.fpl.fs.fed.us. Through FPL's Advanced Housing Research Center, (www.fpl.fs.fed.us/ahrc/), researchers also work to improve homebuilding technologies and materials.

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